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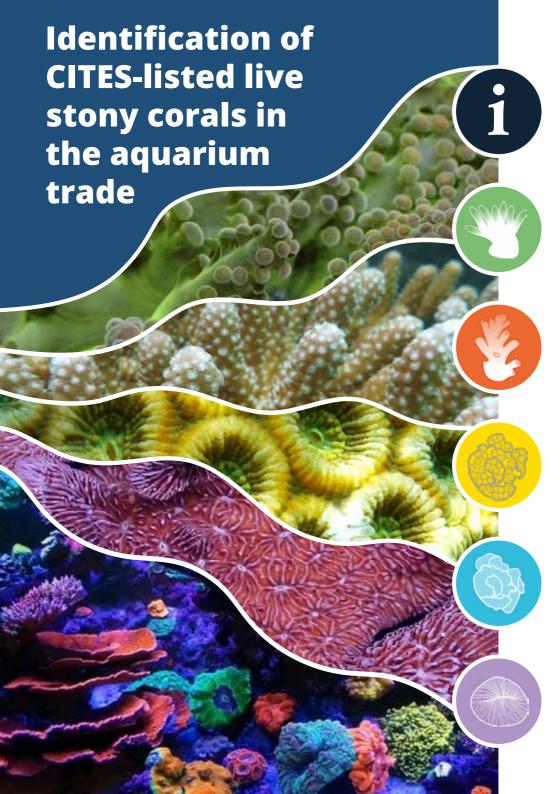












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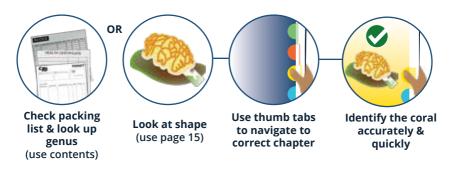
Reviewed by: Prof Dr Bert W. Hoeksema

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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).



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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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

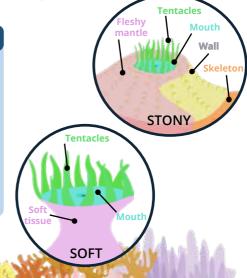
Of all the marine species listed in CITES, stony corals (Scleractinia spp.) are traded in the highest quantity, and are one of the most highly traded commodities globally overall, with living corals in demand for public and home aquariums. There are over 1680 stony coral species worldwide, and over 500 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, 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.



Inspection

Indonesian tag properties

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

· Made from strong, tamper-proof material

Export

• Tag shape can vary as they are developed by companies

Propagation

• Code should be simple enough to be understood by field officers



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Species

····· Propagation month ····

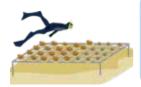
When to use this guide

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.





Import

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





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.

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.

Damaged packaging

2 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.

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.

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.

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.

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

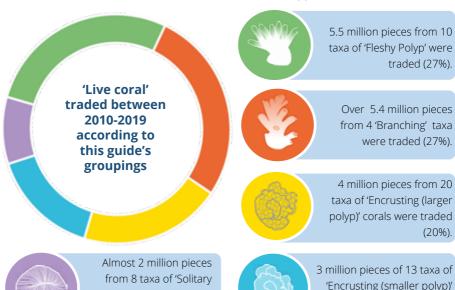


CITES is an international agreement between governments. Its aim is to make sure that international trade in specimens of species listed in its Appendices are regulated appropriately, so as not to threaten their survival in the wild. Trade must be legal, sustainable, and traceable.

i 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.



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.

and Free-living' corals

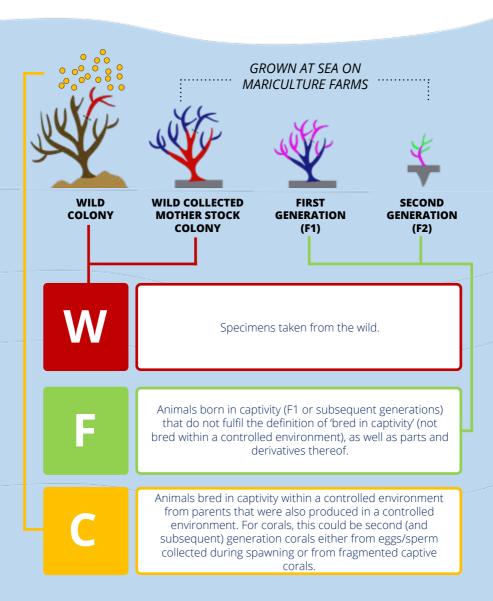
were traded (10%).



corals were traded (15%).

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.



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-importsuspensions-negative-opinions/cites-uk-importsuspensions



SCAN ME



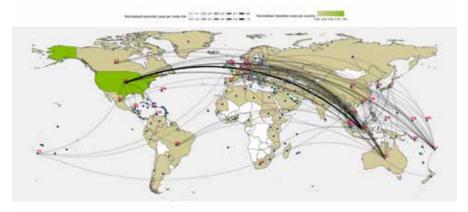
For an EU list of current import restrictions visit:

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.



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.



MEDIUM GROWTH 業業際



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.

Under 100,000 pieces

Global data 2010-2019

100-500,000

pieces Global data 2010-2019

HIGH EXPORT LEVELS

Over 500,000 pieces

Global data 2010-2019

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.

UK IMPORT PRICE

£2-\$20

UK IMPORT PRICE

\$21-\$99

UK IMPORT PRICE

OVER \$100

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.







100-500,000
pieces





Duncanopsammia



100-500,000
pieces
Global data 2010-2019





Euphyllia



Over 500,000
pieces
Global data 2010-2019





Heliofungia



100-500,000
pieces





Plerogyra



100-500,000
pieces
Global data 2010-2019





Blastomussa





Global data 2010-2019



\$2 \$40 UK IMPORT PRICE \$21-\$99



Hydnophora



MEDIUM EXPORT LEVELS

100-500,000 pieces

Global data 2010-2019



\$6 \$18 UK IMPORT PRICE \$2-\$20



Acanthophyllia



100-500,000

pieces Global data 2010-2019



\$8 \$270 UK IMPORT PRICE >\$100



Cynarina



100-500,000 pieces

Global data 2010-2019



\$9 **UK IMPORT PRICE** \$21-\$99



Scolymia



100-500,000

pieces Global data 2010-2019



\$8 \$200 UK IMPORT PRICE >\$100



Trachyphyllia



Over 500,000

pieces Global data 2010-2019

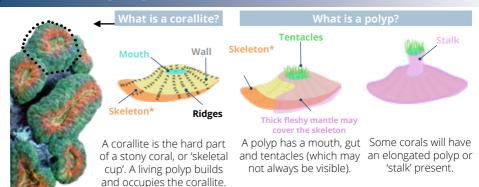


\$2 \$70 UK IMPORT PRICE \$21-\$99

Visual glossary

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

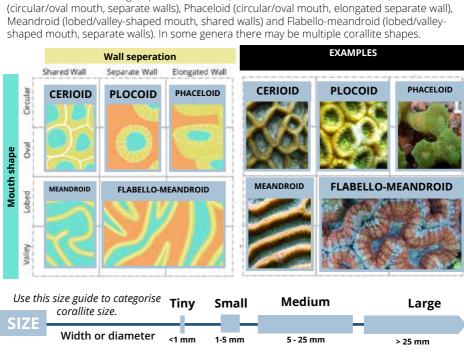
Corallite properties



*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.

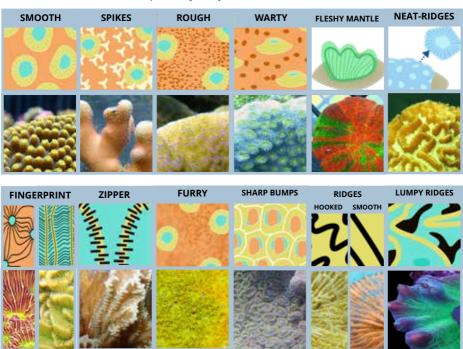
CORALLITE SHAPE AND SIZE

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 Meandroid (lobed/valley-shaped mouth, shared walls) and Flabello-meandroid (lobed/valleyshaped mouth, separate walls). In some genera there may be multiple corallite shapes.

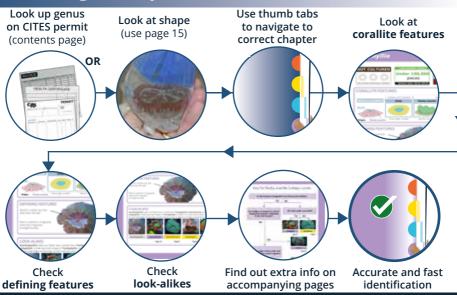


SKELETAL/WALL TEXTURES

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.

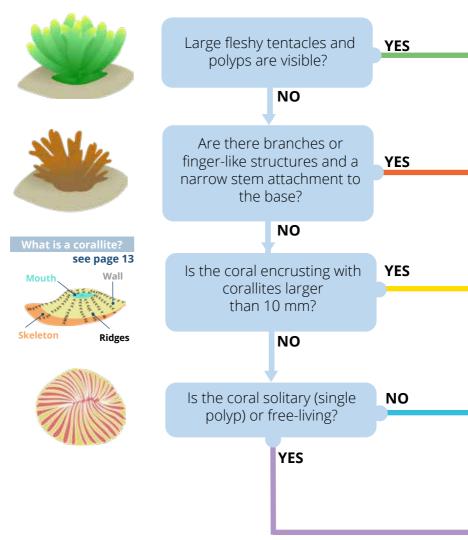


Working example



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.



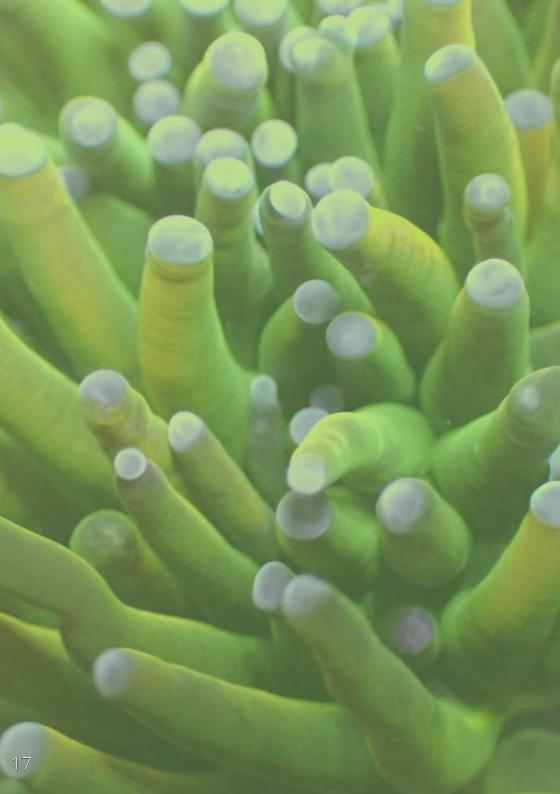
Colour should not be used for identification

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.







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.

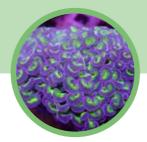
DID YOU KNOW?

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.



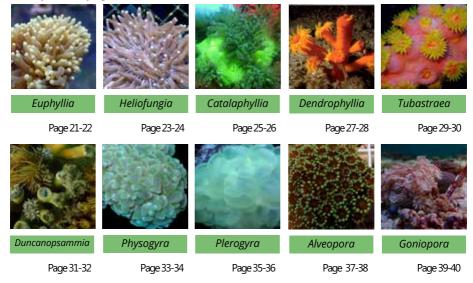




Overview

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.*



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).



Detecting false mariculture

- **Growing edge**
 - Healthy growing edge established on the artificial base, no fresh cuts or glue present.
- **Artificial base properties** Artificial base and mariculture tag has biofouling of marine life e.g., calcareous algae.
- **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 SIGN OF FALSE MARICULTURE



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



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

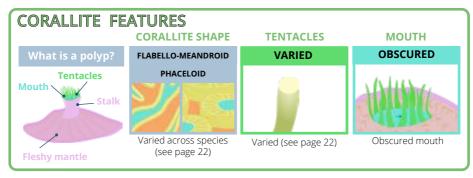


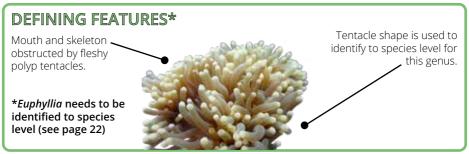
Over 500,000
pieces
Global data 2010-2019

\$3 \$400

UK IMPORT PRICE
PER PIECE OR POLYP

OVER \$100





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

Plerogyra

Heliofungia

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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.



CHECK SPECIES











E. paraancora

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









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.



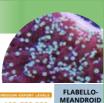
pieces





E. divisa

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





pieces





E. paradivisa

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

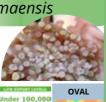






E. yaeyamaensis

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.

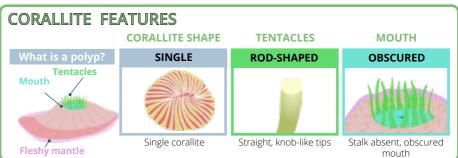
Heliofungia

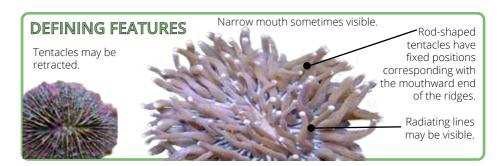


100-500,000
pieces
Global data 2010-2019

UK IMPORT PRICE
PER PIECE

BETWEEN \$21-99





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.



Important distinctions

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.





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.



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

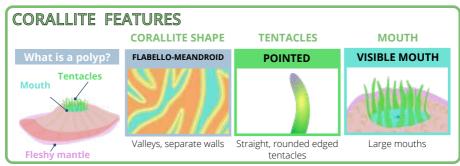
Catalaphyllia



Over 500,000
pieces
Global data 2010-2019

UK IMPORT PRICE
PER PIECE

BETWEEN \$21-99





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.



Page 21 Page 23

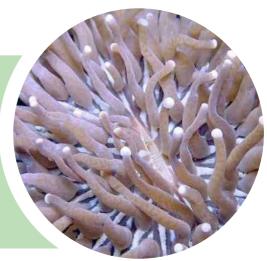
Important distinctions

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.



Dendrophyllia



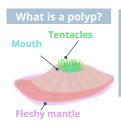
LOW EXPORT LEVELS Under 100,000 pieces Global data 2010-2019

\$13 \$28

UK IMPORT PRICE PER PIECE

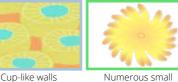
BETWEEN \$21-99







CORALLITE SHAPE





MOUTH

tapering tentacles

TENTACLES

FLOWER-LIKE

Small mouth

DEFINING FEATURES

Polyps highly elongated.

Polyps often visible and 'sea-anemonelike' 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

Duncanopsammia

Turbinaria

Page 29

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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

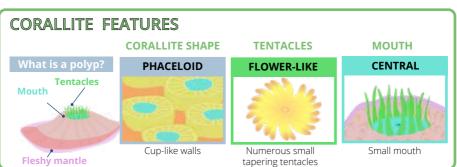
Wild sourced specimens of this species have been subject to import restrictions into the EU from Indonesia. However, over 96,000 live pieces were traded globally between 2010-2019, including imports of Source Code 'F' specimens by the EU, according to CITES trade data.

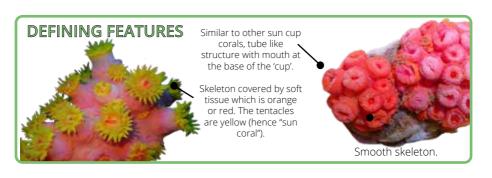
Tubastraea



100-500,000
pieces
Global data 2010-2019

UK IMPORT PRICE
PER PIECE
BETWEEN \$2-20





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).



Page 27

Page 31

Page 115



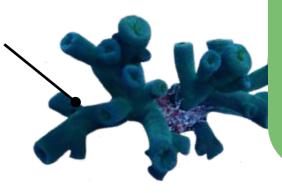
Colour morphs

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.



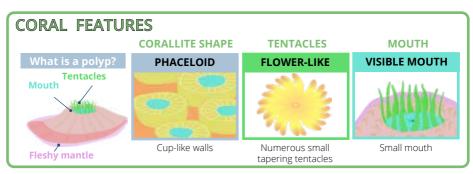
Duncanopsammia

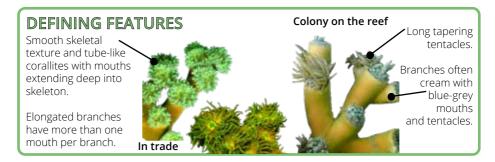


100-500,000
pieces
Global data 2010-2019

UK IMPORT PRICE
PER POLYP

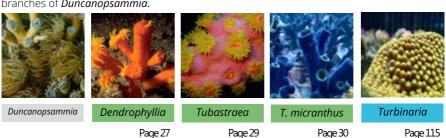
OVER \$100





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*.



Examples in trade



Only one species in this genus:

Duncanopsammia axifuga



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

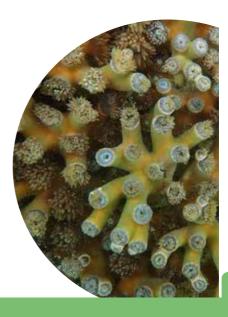


Because of the rarity of this taxon, trade in this species is likely to be in wild-sourced specimens, Source Code 'W'.

Between 2010 - 2019, 189,000 pieces were traded globally, primarily from Australia.

Top importers: USA, EU, UK.



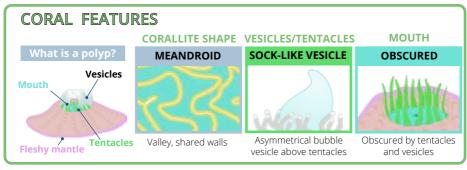


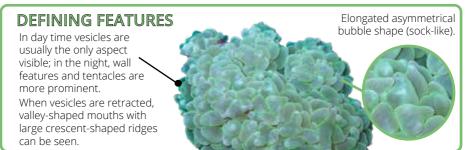
Physogyra



100-500,000
pieces
Global data 2010-2019

UK IMPORT PRICE
PER PIECE
BETWEEN \$2-20





LOOK-ALIKES

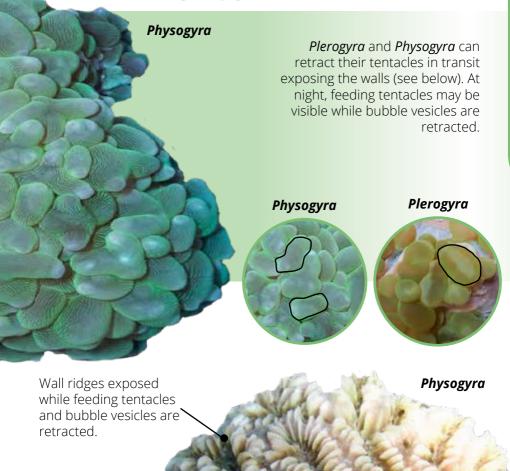
Physogyra has elongated sock-like vesicles, opposed to grape-like vesicles of *Plerogyra* or hammer-shaped tentacles of some *Euphyllia* species. *Physogyra* polyps are arranged in tightly-packed narrow valleys, while *Plerogyra* valleys are larger and more spaced.



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Retracted polyps in bubble corals



Valleys between walls exposed.

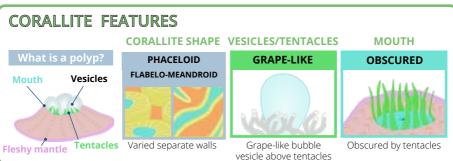
Plerogyra

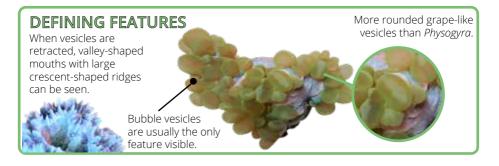


100-500,000
pieces
Global data 2010-2019

UK IMPORT PRICE
PER PIECE

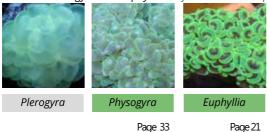
BETWEEN \$21-99





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 diversity in appearance

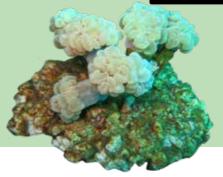
Plerogyra has diverse appearance, but all species have large (5–10 mm) rounded fingernail-like ridges on the skeleton, although this detail may be obscured by bubble vesicles.



CHECK GENUS

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







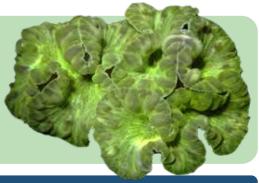
P. sinuosa has tightly packed flabello-meandroid valleys and is covered in grape-like vesicles.



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







Taxonomic changes

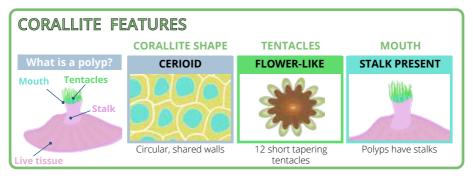
CITES permits must reflect current CITES nomenclature, details can be found: www.speciesplus.net Taxonomy of corals is complex and may be subject to change. For accepted scientific names see: www.marinespecies. org.

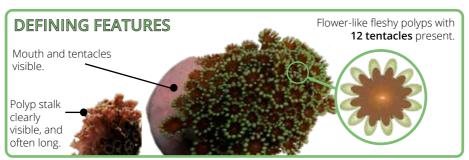
Alveopora



Under 100,000
pieces
Global data 2010-2019

UK IMPORT PRICE
PER PIECE
BETWEEN \$21-99





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.



1000

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*.

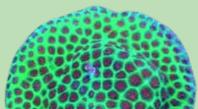
Goniopora



Astreopora



Porites

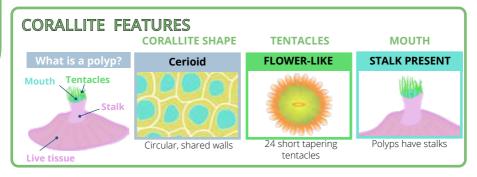


Goniopora



Over 500,000
pieces
Global data 2010-2019

UK IMPORT PRICE
PER PIECE OR POLYP
BETWEEN \$2-20





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.



Diversity in appearance of Goniopora



Goniopora lobata Tentacles are elongated and finger-like.

Goniopora columna stalks may be thicker and longer.

stalks.





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

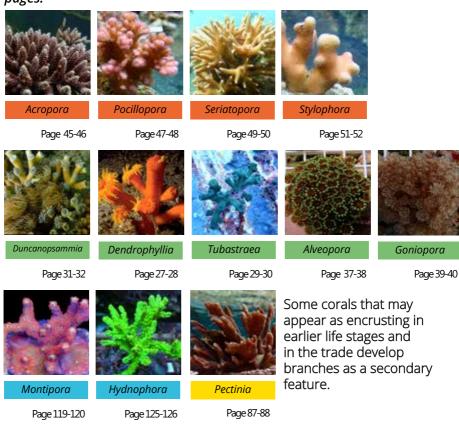


Table-like

Overview

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.





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

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

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

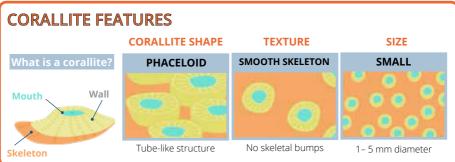
However, higher-value *Acropora* will continue to be imported.

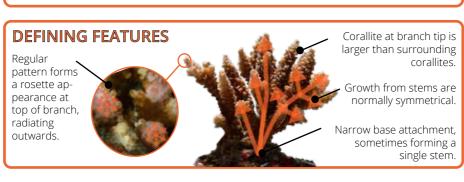
Acropora

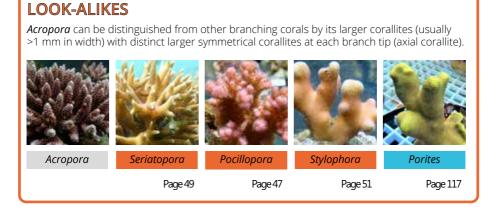


Over 500,000
pieces
Global data 2010-2019

UK IMPORT PRICE
PER PIECE
BETWEEN \$21-99



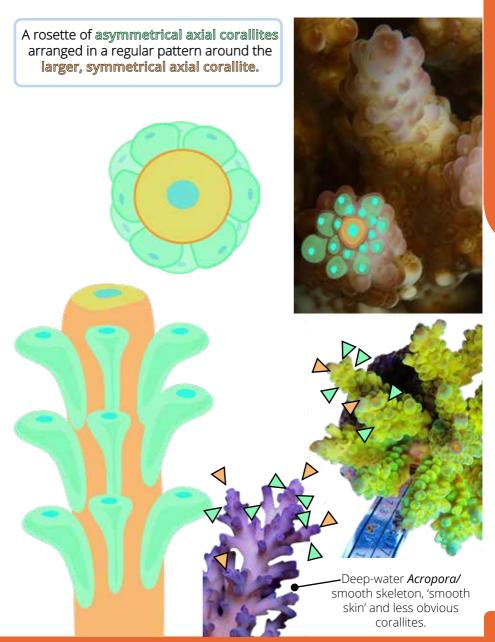






Unique *Acropora* corallites

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.

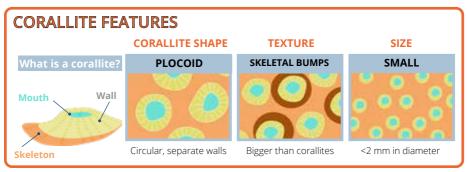


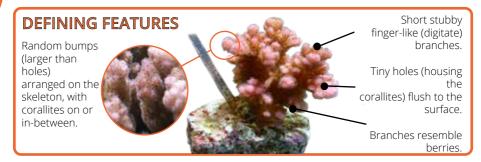
Pocillopora



100-500,000
pieces
Global data 2010-2019

UK IMPORT PRICE
PER PIECE
BETWEEN \$2-20







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.

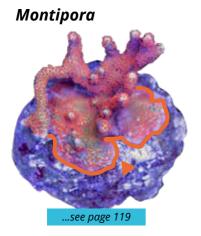


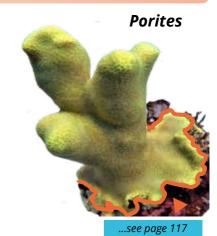


Growth variation in branching corals

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.







EXAMPLES OF CORALS WITH BRANCHING FORMS

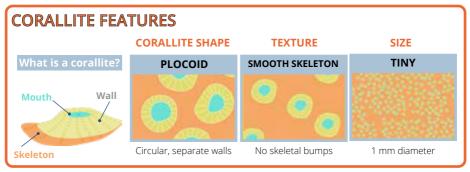


Seriatopora



100-500,000
pieces
Global data 2010-2019

UK IMPORT PRICE
PER PIECE
BETWEEN \$2-20







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

Pocillopora

Porites

Stylophora

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Page 47

Page 117

Page 51



Branching corals in the wild

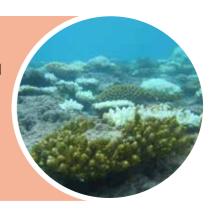
Branching corals are fast-growing, fragment easily and are often common on natural reefs, meaning they are usually considered low risk in the trade





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.

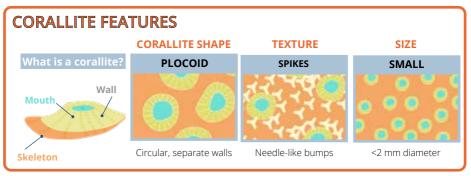


Stylophora



100-500,000
pieces
Global data 2010-2019

UK IMPORT PRICE
PER PIECE
BETWEEN \$2-20







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



Seriatopora



Montipora

-9.-4....

TOTICS

rocinopora

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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.

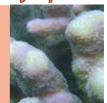


...see page 117

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.







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.







Overview

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.*





Detecting false mariculture

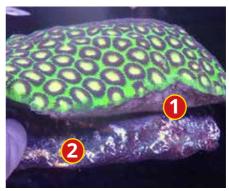
- **Growing edge**
 - Healthy growing edge established on the artificial base, no fresh cuts or glue present.
- **Artificial base properties** Artificial base and mariculture tag has biofouling of marine life e.g., calcareous algae.
- Size of colony relative to base Maricultured corals in this group are usually only as big as their artificial base or smaller than it.
- **Growing edge is the most important feature to inspect**





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



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

Colony bigger than its artificial base.





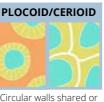


Over 500,000
pieces
Global data 2010-2019

UK IMPORT PRICE
PER PIECE
OVER \$100

CORALLITE FEATURES





CORALLITE SHAPE





SIZE

mantle Circular walls shows separate

Mantle over walls

TEXTURE

FLESHY MANTLE

10-50 mm diameter

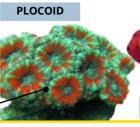
DEFINING FEATURES

Note: Colour is not a reliable character for identification.

CERIOID

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

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

Favites

Favia

Lobophyllia

Scolymia

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Page 61

Page 133

Shared compared to separate walls

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*.

SHARED





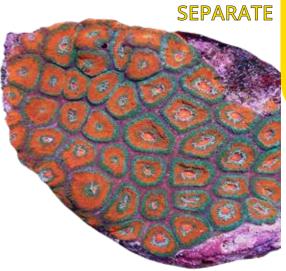
Acanthastrea enchinata

Acanthastrea bowerbanki

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.





\$2 \$40

UK IMPORT PRICE PER PIECE OR POLYP

BETWEEN \$21-\$99

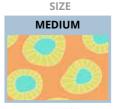
CORALLITE FEATURES







TEXTURE



Circular, separate walls

Mantle over walls

7 - 25 mm in diameter

DEFINING FEATURES

Fleshy mantle

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

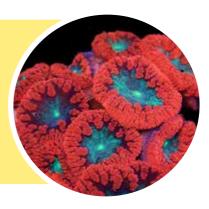
Acanthastrea

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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.



Lobophyllia



HIGH EXPORT LEVELS Over 500,000 pieces

Global data 2010-2019

\$72 \$6 **UK IMPORT PRICE PER PIECE**

BETWEEN \$21-\$99

CORALLITE FEATURES



CORALLITE SHAPE PHACELOID FLABELO-MEANDORID



FLESHY MANTLE

TEXTURE



oval mouths

Mantle over walls

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.







Trachyphyllia



Australomussa



Symphyllia



Acanthastrea

Page 131

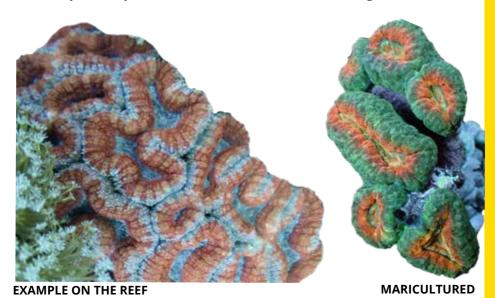
Page 63

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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.



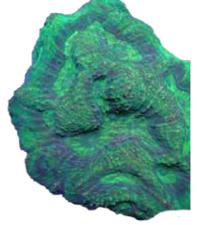
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Taxonomic changes

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





Unlike *Lobophyllia*, *Australomussa* has fused walls.

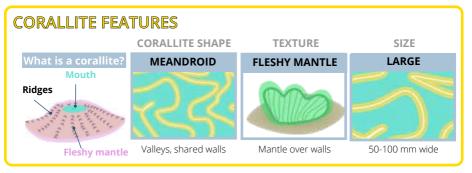
...see page 63

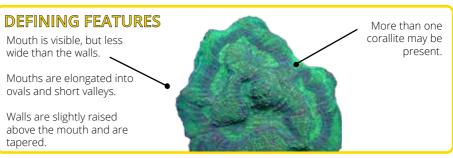
Australomussa



Under 100,000
pieces
Global data 2010-2019

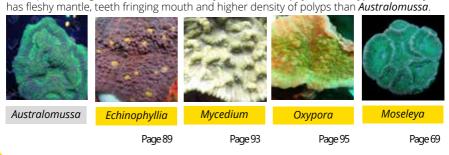
UK IMPORT PRICE
PER PIECE
BETWEEN \$21-\$99





LOOK-ALIKES

The 'flatness' of *Austalomussa*'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*.

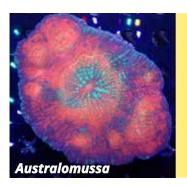


Colourful fleshy mantles

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.).





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.





Taxonomic changes

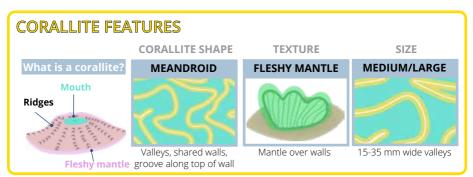
CITES permits must reflect current CITES nomenclature, details can be found: www.speciesplus.net Taxonomy of corals is complex and may be subject to change. For accepted scientific names see: www.marinespecies. org.

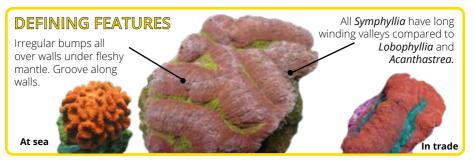
Symphyllia



100-500,000
pieces
Global data 2010-2019

UK IMPORT PRICE
PER PIECE
BETWEEN \$21-\$99





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



Trachyphyllia



Lobophyllia



Australomussa



Platygyra

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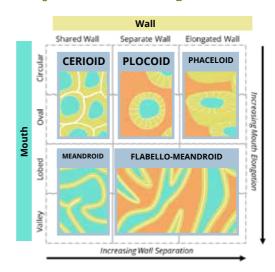
Page 63

Page 81

Corallite shape diversity

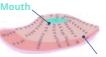
Corallite shape is based on mouth shape and wall separation. Although this feature is a continuum, this guide uses 5 corallite groups for ease of identification. If genus has more than one shape type, they are all featured on the genus pages.

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.

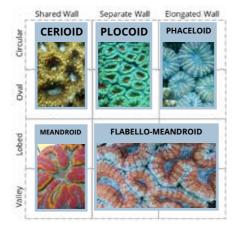


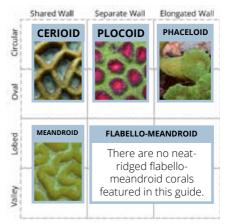
Fleshy mantle arrangement.

NEAT-RIDGES

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







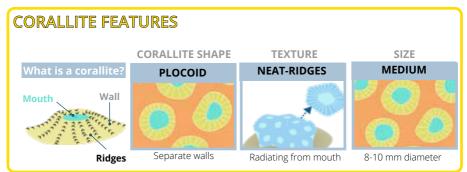
These examples show fleshy mantle and neat-ridge corals but there may be some overlap. For example, *Caulastrea* (page 83) has neat-ridges but also a fleshy tissue covering the walls.

Diploastrea



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

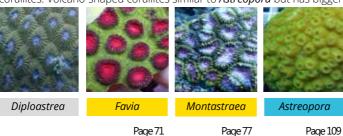
\$81 **UK IMPORT PRICE** PER PIECE **BETWEEN \$2-\$20**





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.



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Ecology of Diploastrea



15,572

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.

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.



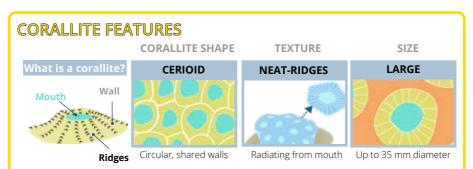
Moseleya

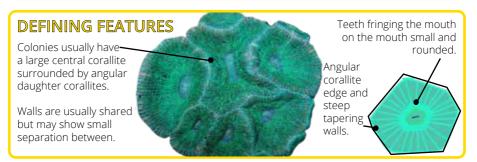


Under 100,000
pieces
Global data 2010-2019

UK IMPORT PRICE
PER PIECE

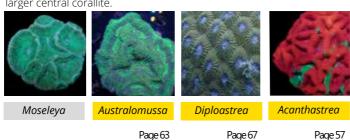
BETWEEN \$21-\$99





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.



Trade levels of encrusting (larger polyp) corals





506.449

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*.

Moseleya is not currently cultured and

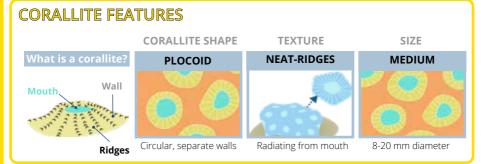




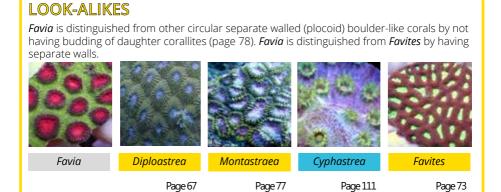


100-500,000 pieces UK IMPORT PRICE
PER PIECE

8-12 months to culture Global data 2010-2019 BETWEEN \$21-\$99







Teeth fringing mouths in coral

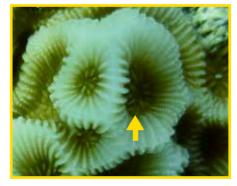
Favites
TEETH ABSENT



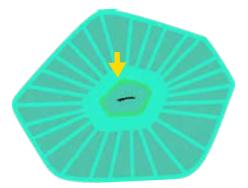
The prescence of teeth fringing the mouth is a good distinction in corals across chapters. This page compares corals to help users spot this feature.

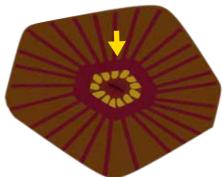


Moseleya
TEETH POORLY DEVELOPED
Teeth small and rounded.



Goniastrea
TEETH WELL DEVELOPED
Teeth long and more robust.





Favites



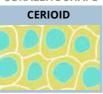
MEDIUM EXPORT LEVELS 100-500,000 pieces Global data 2010-2019

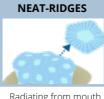
\$401 **UK IMPORT PRICE** PER PIECE

BETWEEN \$21-\$99

CORALLITE FEATURES CORALLITE SHAPE







TEXTURE



Ridges Circular, shared walls

Radiating from mouth

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

Favia

Oulophyllia

Acanthastrea

Goniastrea

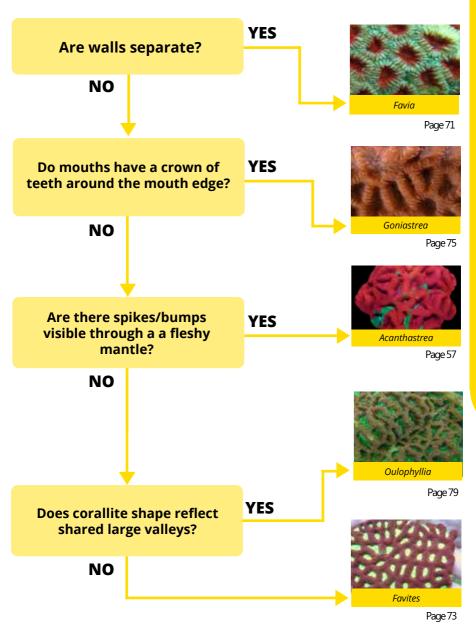
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Key to Favites look-alikes





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

Goniastrea

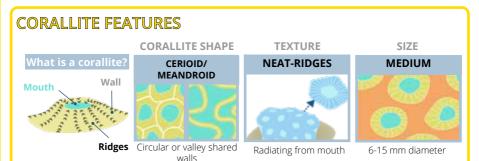


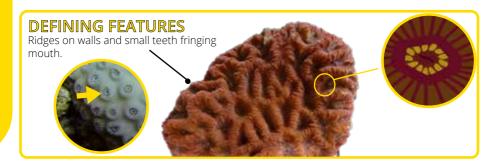
100-500,000
pieces
Global data 2010-2019

\$12 \$58

UK IMPORT PRICE
PER PIECE

BETWEEN \$21-\$99





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.



Wall shape of neat-ridged corals

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





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

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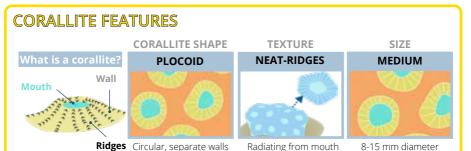
Montastraea

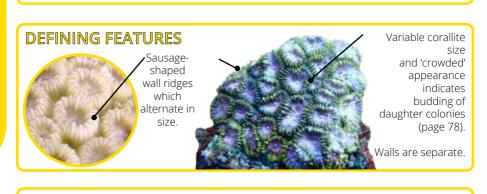


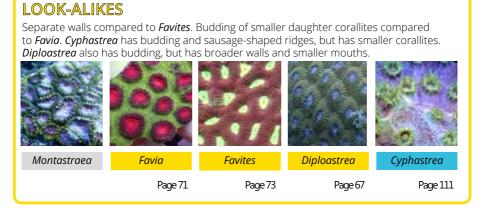


UK IMPORT PRICE
PER PIECE

BETWEEN \$2-\$20



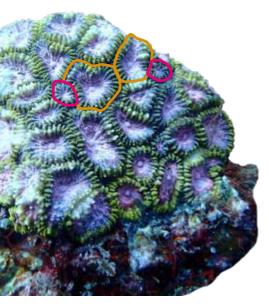




Distinct corallite formation

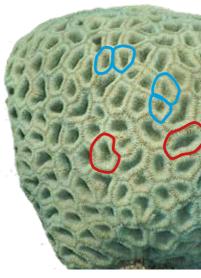
Different encrusting (larger polyp) coral genera grow new corallites in two different ways.

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

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Oulophyllia



Under 100,000
pieces
Global data 2010-2019

UK IMPORT PRICE
PER PIECE

BETWEEN \$21-\$99

CORALLITE FEATURES CORALLITE SHAPE TEXTURE SIZE What is a corallite? Meandroid Neat-Ridges Wall Wall 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).

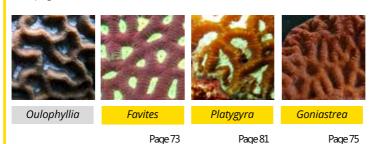


Valleys may be variable in size but appear lobed in shape.

> Valleys are wider than other neatridged corals (10-50 mm).

LOOK-ALIKES

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



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.



Platygyra

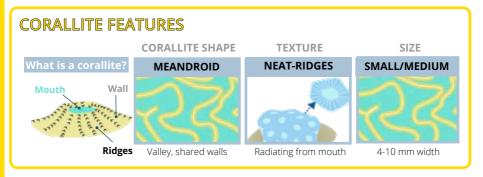


100-500,000
pieces
Global data 2010-2019

\$5 \$45

UK IMPORT PRICE
PER PIECE

BETWEEN \$21-\$99





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

Goniastrea

Favites

Merulina

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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 neatridge corals such as *Goniastrea* and *Favites*.



Caulastraea





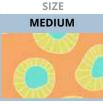
\$12 **UK IMPORT PRICE** PER PIECE **BETWEEN \$2-\$20**







TEXTURE



Fleshy mantle

Tube-like structure

mouth, mantle over walls

8-15 mm diameter

DEFINING FEATURES

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





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

Dendrophyllia

Blastomussa

Duncanopsammia

Lobophyllia

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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*.

Galaxea

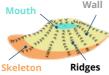


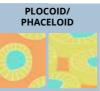
MEDIUM EXPORT LEVELS 100-500,000 pieces Global data 2010-2019

\$7I **UK IMPORT PRICE** PER PIECE **BETWEEN \$2-\$20**







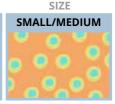


CORALLITE SHAPE





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 starlike shape.



Mouths are circular to oval and fringed by long spines.

Small transparent tentacles may be visible during the day.

LOOK-ALIKES

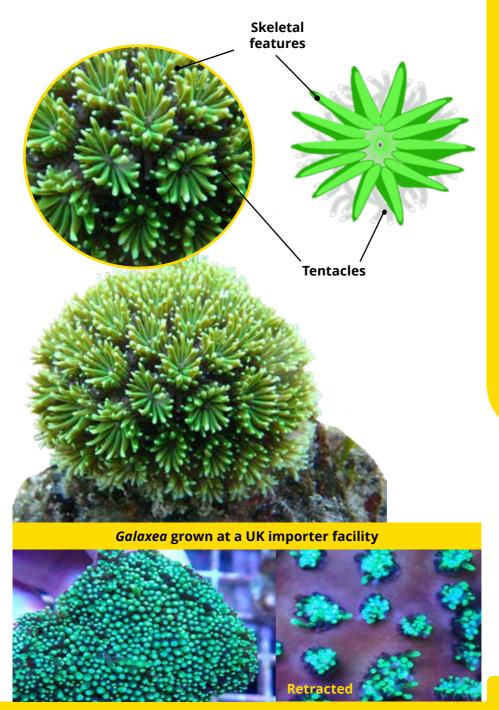
Galaxea is a highly distinctive genus with the longest spines fringing mouth that are inside a ring of tentacles. No other coral genus has this feature.



Galaxea

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

The starry spines of Galaxea



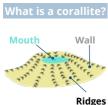
Pectimia

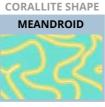


MEDIUM EXPORT LEVELS 100-500,000 pieces Global data 2010-2019

\$55 **UK IMPORT PRICE PER PIECE BETWEEN \$21-\$99**









TEXTURE



Valleys, shared walls

Irregular wall ridges

Size range unknown, form lumps and spikes 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

Montipora

Trachyphyllia

Australomussa

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Page 119

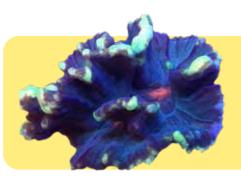
Page 131

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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.

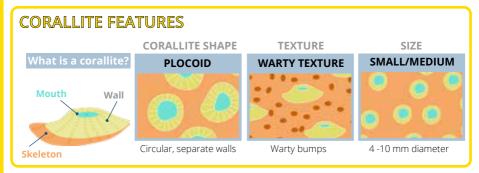


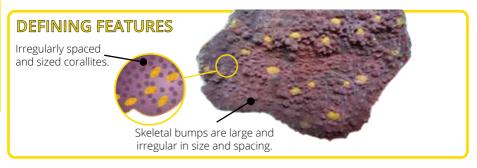
Echinophyllia



100-500,000
pieces
Global data 2010-2019

UK IMPORT PRICE
PER PIECE
BETWEEN \$21-\$99







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

Mycedium

Oxypora

Turbinaria

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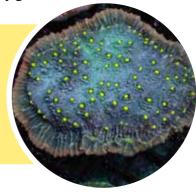
Page 95

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

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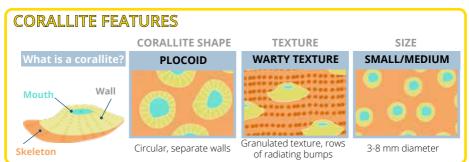
Echinopora

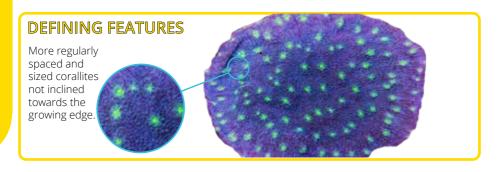


100-500,000
pieces
Global data 2010-2019

UK IMPORT PRICE
PER PIECE

BETWEEN \$2-\$20





LOOK-ALIKES

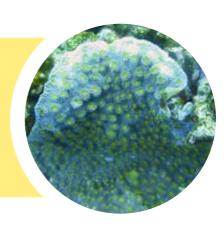
Echinopora is easily confused with other Chalice corals. It tends to have more regular spacing and size of corallites than other genera.



Echinopora 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 highlight 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.

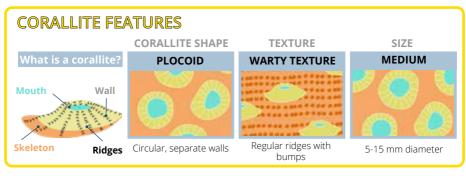
Mycedium

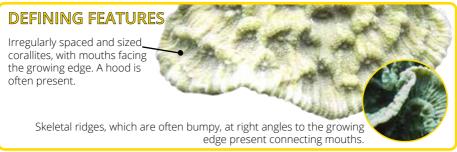


100-500,000
pieces
Global data 2010-2019

UK IMPORT PRICE
PER PIECE

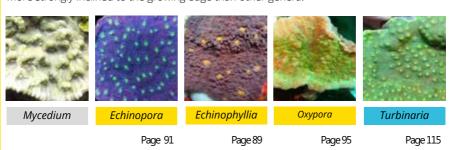
BETWEEN \$21-\$99





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.



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

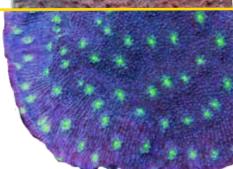
Skeletal bumps:

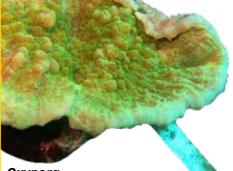
Size - Small and regular

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



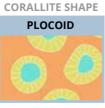
Under 100,000
pieces
Global data 2010-2019

UK IMPORT PRICE
PER PIECE

BETWEEN \$21-\$99

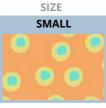
CORALLITE FEATURES







TEXTURE



Circular, separate walls

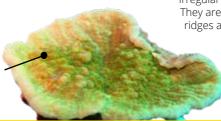
Random skeletal bumps

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

Echinophyllia

Mycedium

Turbinaria

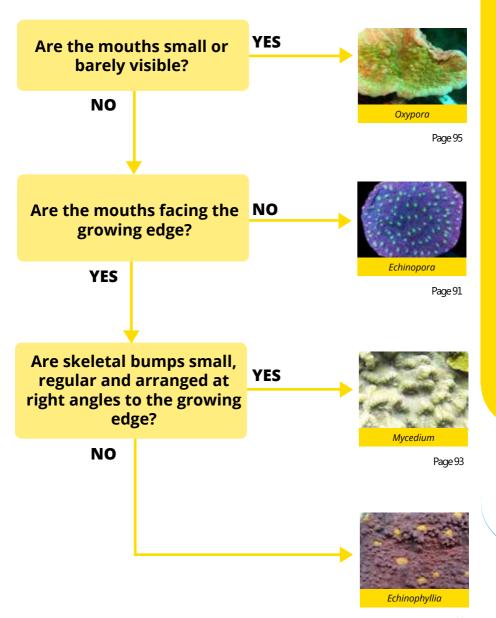
Page 91

Page 89

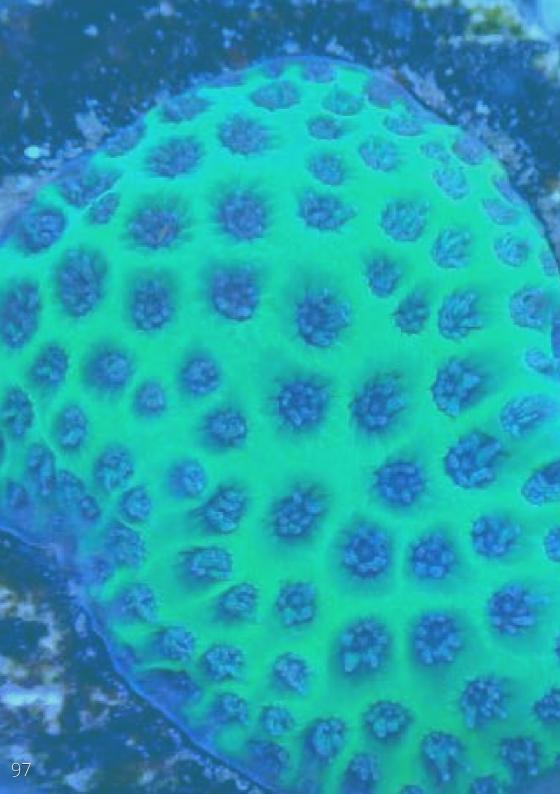
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Key for Chalice corals



Page 89





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

Overview

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.*





Detecting false mariculture

- **Growing edge**
 - Healthy growing edge established on the artificial base, no fresh cuts or glue present.
- **Artificial base properties** Artificial base and mariculture tag has biofouling of marine life e.g. calcareous algae present.
- Size Maricultured encrusting corals should cover most, if not all the hase.
- Healthy encrusting edge attached to artificial base

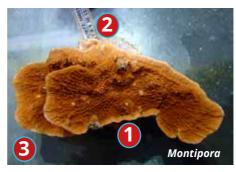
SIGN OF TRUE MARICULTURE SIGN OF FALSE MARICULTURE



Healthy-looking edge encrusting onto biofouled base.



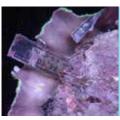
This example has encrusted over half of the artificial base and shows healthy growth.



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



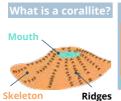
Under 100,000
pieces
Global data 2010-2019

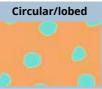
\$33 \$34

UK IMPORT PRICE PER PIECE

BETWEEN \$21-\$99



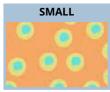




CORALLITE SHAPE



TEXTURE



SIZE

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

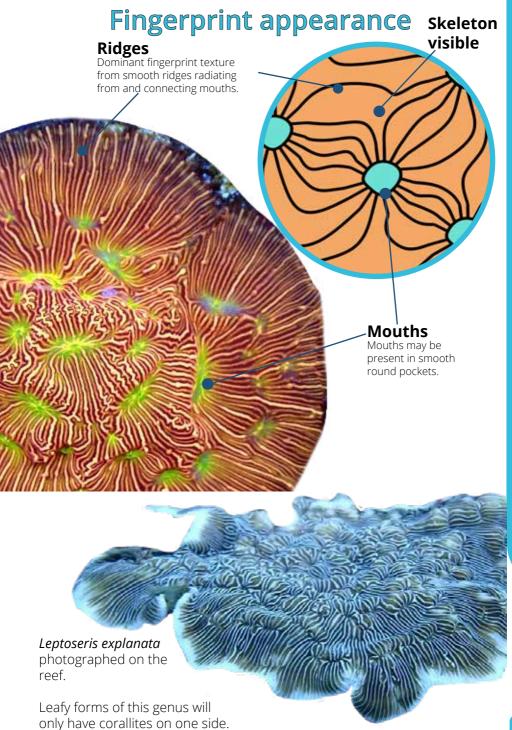
Pavona

Pachyseris

Page 107

Page 103





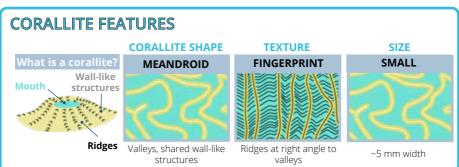
Pachyseris







Mouths are lobed to





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.

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



Pavona



Merulina



Platygyra

Page 101

Page 107

Page 123

Page 81

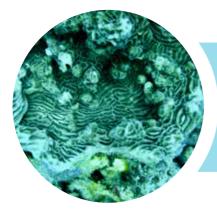


Diverse forms of *Pachyseris*



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

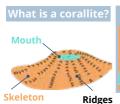


Under 100,000
pieces
Global data 2010-2019

\$15 \$25 UK IMPORT PRICE

PER PIECE
BETWEEN \$21-\$99



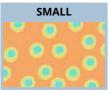




CORALLITE SHAPE



TEXTURE



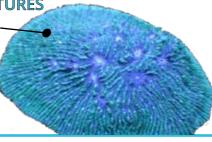
SIZE

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.

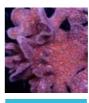
LOOK-ALIKES

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











Lithophyllon

Pachyseris

Leptoseris

Pavona

Fungia

Page 103

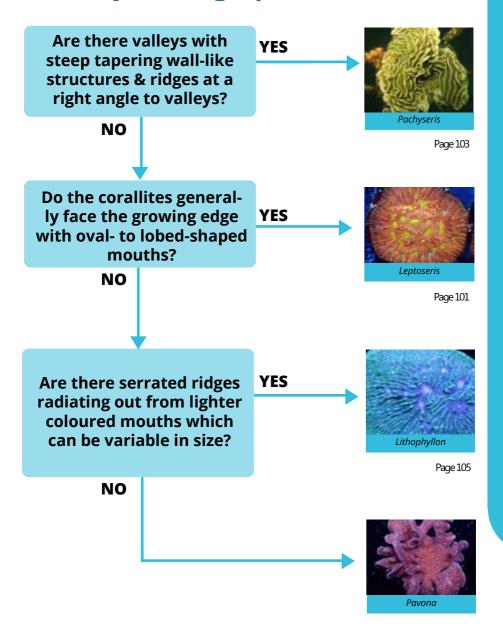
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Key for fingerprint corals



Page 107

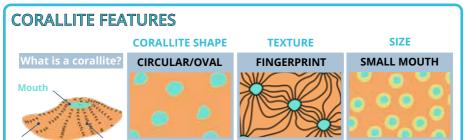




UK IMPORT PRICE
PER PIECE

BETWEEN \$21-\$99

2-5 mm width



Wall not visible



Ridges

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

Skeleton

Leafy forms have mouths on both sides.



Mouths connected by

ridges

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



Pachyseris



Psammocora

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Page 121



Comparing fingerprint corals

Leptoseris

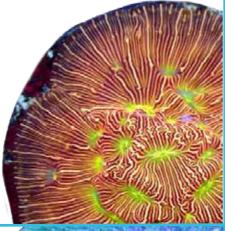
Corallite shape - Circular/oval found on only one side of leafy forms Walls - Not visible Ridges - Smooth



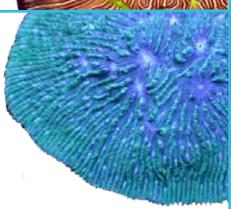
Corallite shape - Valleys shared wall-like structures (meandroid) found on only one side of leafy forms

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

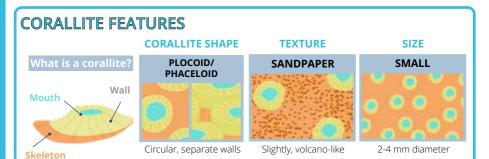
Astreopora



Under 100,000
pieces
Global data 2010-2019

UK IMPORT PRICE
PER PIECE

BETWEEN \$2-\$20





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

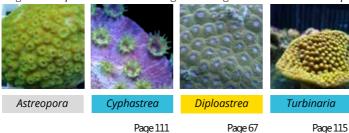
May appear more encrusting in trade.



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.





Trade of encrusting (smaller polyp) corals

HIGH EXPORT LEVELS

Over 500,000 pieces

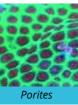
Global data 2010-2019



Montipora 876,821



672,071



590,702

MEDIUM EXPORT LEVELS

100-500,000 pieces

Global data 2010-2019

Hydnophora

356,835



210,394



Pavona 146,263

LOW EXPORT LEVELS

Under 100,000 pieces

Global data 2010-2019



Pachyseris 46,075



32,619



30,211



24,655



16,998



9,819



9.488

Cyphastrea



Under 100,000
pieces
Global data 2010-2019

UK IMPORT PRICE
PER PIECE

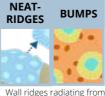
BETWEEN \$21-\$99

CORALLITE FEATURES





CORALLITE SHAPE



TEXTURE



Circular, separate, volcano like

Wall ridges radiating from mouth and skeletal bumps

Some skeletal bumps may be present

2-3 mm diameter

DEFINING FEATURES

Regularly spaced circular corallites that are often slightly elongated.



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

Leptastrea

Astreopora

Turbinaria

Page 67

Page 113

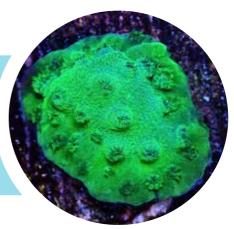
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Look-alikes, a closer look...

Cyphastrea has small volcanoshaped 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.



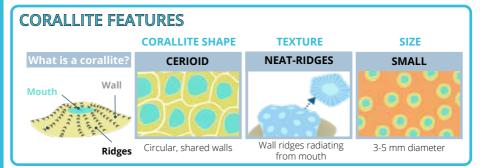
Leptastrea



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

\$8 \$391 **UK IMPORT PRICE PER PIECE**

BETWEEN \$21-\$99





Irregularly sized and spaced corallites, walls usually shared.

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

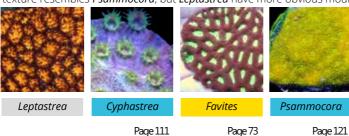
Ridges radiating from mouth do not align with neighbouring corallites.



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.

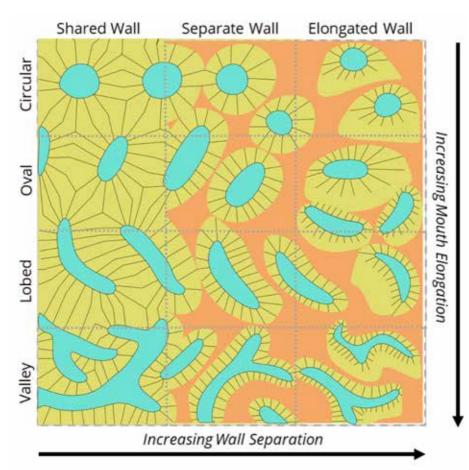


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Diverse growth morphology

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 Flabellomeandroid. 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.

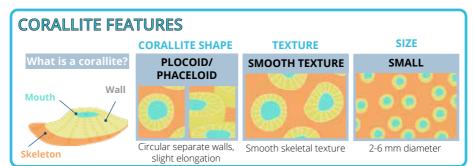
Turbinaria

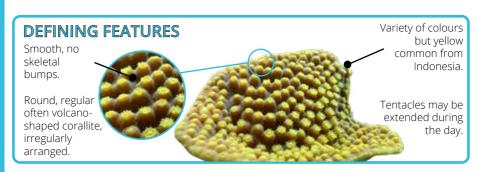


Over 500,000
pieces
Global data 2010-2019

UK IMPORT PRICE
PER PIECE

BETWEEN \$2-\$20





LOOK-ALIKES

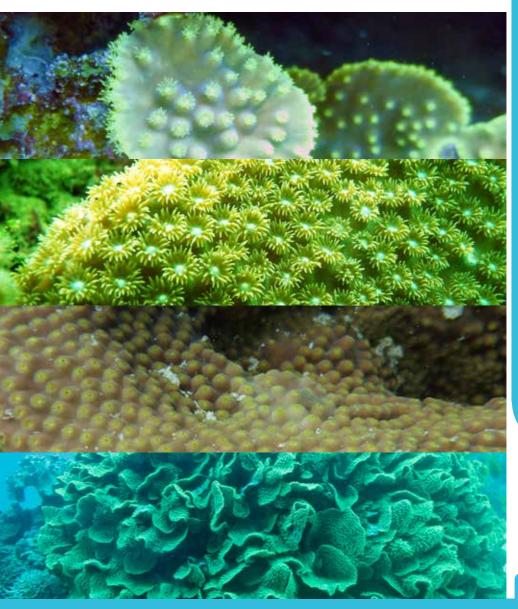
Turbinaria has smooth skeleton and flower-like tentacles similar to *Dendrophyllia and Tubastraea*, but its corallites are smaller and the tentacles less striking and often retracted. Similar volcano-shaped and sized corallites as *Astreopora* and *Cyphastrea*, but lacks clearly visible skeletal texture





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.

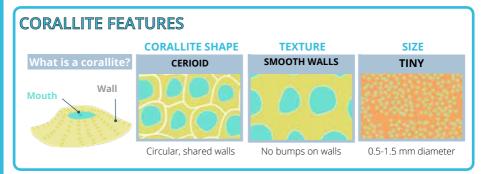


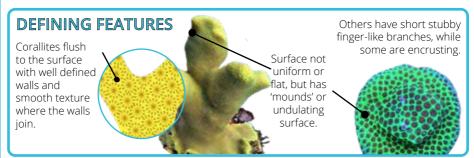
Porites



Over 500,000
pieces
Global data 2010-2019

UK IMPORT PRICE
PER PIECE
BETWEEN \$2-\$20





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

Stylophora

Pocillopora

Montipora

Seriatopora

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Morphological diversity of *Porites*

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

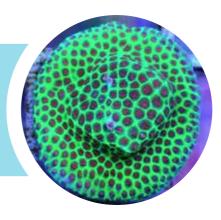
Corallites in all species are tiny, circular and tightly packed with shared walls. The surface of the walls is smooth lacking bumps or ridges.





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**

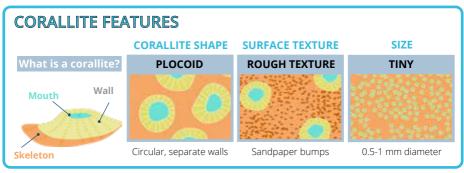
Porites may be mislabelled as **Montipora** as both have small corallites and are encrusting, which makes them hard to distinguish for traders.

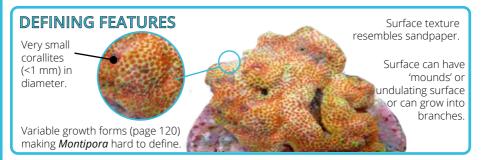
Montipora





\$651 **UK IMPORT PRICE** PER PIECE **BETWEEN \$21-\$99**







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

Porites

Stylophora

Pocillopora

Seriatopora

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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).



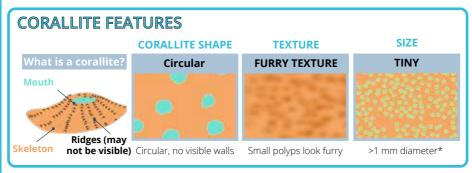
Psammocora



Under 100,000
pieces
Global data 2010-2019

UK IMPORT PRICE
PER PIECE

BETWEEN \$21-\$99





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*.





Trade of encrusting (smaller polyp) corals

HIGH EXPORT LEVELS

Over 500,000 pieces

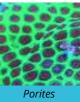
Global data 2010-2019



Montipora 876,821



672,071



590,702

MEDIUM EXPORT LEVELS 100-500,000 pieces

Global data 2010-2019



Hydnophora 356,835



210,394



Pavona 146,263

LOW EXPORT LEVELS Under 100,000 pieces

Global data 2010-2019



Pachyseris 46,075



32,619



Leptastrea 30,211





16,998



9,819



9,488

Merulina

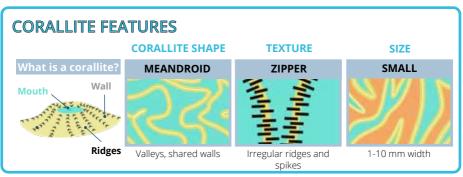


100-500,000
pieces
Global data 2010-2019

\$6 \$15

UK IMPORT PRICE
PER PIECE

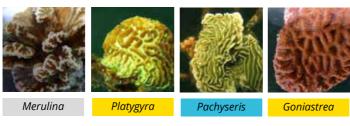
BETWEEN \$2-\$20





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*.



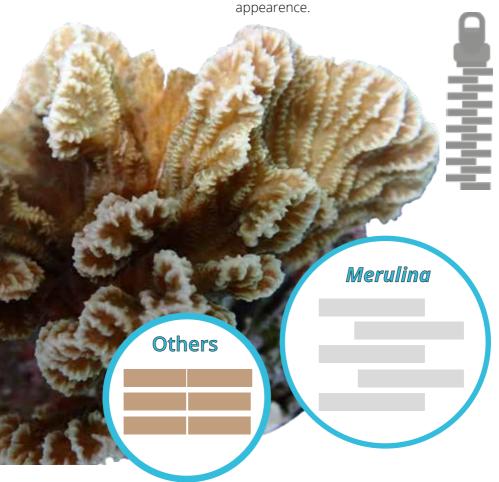
Page 81 F

Page 103 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



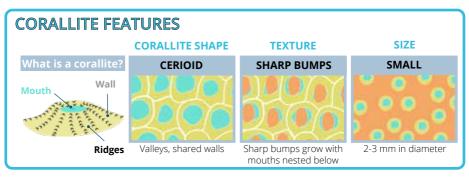
Radiating: *Merulina*

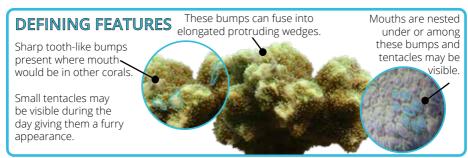
Hydnophora



100-500,000
pieces
Global data 2010-2019

UK IMPORT PRICE
PER PIECE
BETWEEN \$2-\$20





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



Montipora



Psammocora



Pectinia

Page 119

Page 121

Page 87

Diverse growth morphology



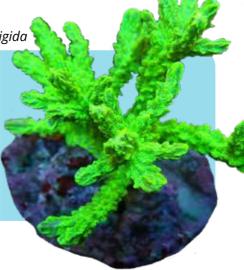
Hydnophora exesa

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.



CHECK GENUS





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?

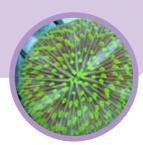
Some solitary corals are free-living in the natural environment and are not attached to solid reef substrates/rocky reef substrates, e.g. *Fungia, Cycloseris, Trachyphyllia*. However, they will be attached to an artificial base for trade.

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.







Overview

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



Scolymia





Find a fleshy mantle coral key on page 138

Trachyphyllia

Page 131-132

Page 133-134

Page 135-136

Page 137-138

FREE-LIVING SINGLE MOUTH







Fungia

Cycloseris

Heliofungia

Page 139-140

Page 141-142

Page 23-24

FREE-LIVING MULTIPLE MOUTHS





Herpolitha

Polyphyllia

Page 143-144

Page 145-146

SIMILAR-LOOKING CORALS FROM OTHER CHAPTERS







Lobophyllia

Australomussa

Euphyllia

Page 61-62

Page 63-64

Page 21-22



Detecting false mariculture

- **Fragmentation**
 - Solitary corals that have been fragmented from 'mother stock' will always have a healed cut.
- **Budding** Budding of solitary corals e.g. Fungiidae following collection stress. Budded corals are traded as Source Code 'W' but are smaller in size.
- **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 SIGN OF FALSE MARICULTURE

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







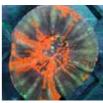
Budding can be triggered following collection. 'Buds' are separated and grown on for export.



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







Scolymia

Trachyphyllia





\$2 \$70

UK IMPORT PRICE
PER PIECE

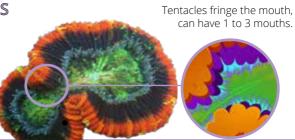
BETWEEN \$21-\$99



DEFINING FEATURES

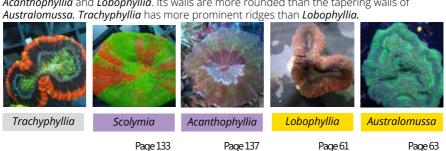
Mouth is visible and is usually as wide as or wider than the walls.

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



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*.





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**.



HIGH EXPORT LEVELS

Over 500,000 pieces

Global data 2010-2019



CHECK GENUS

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





Mariculture



SLOW GROWTH

Trachyphyllia is slowgrowing 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.

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



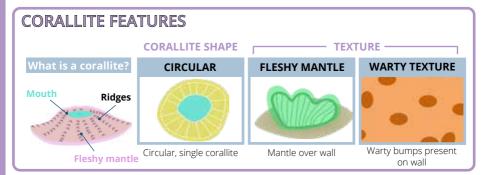
Scolymia

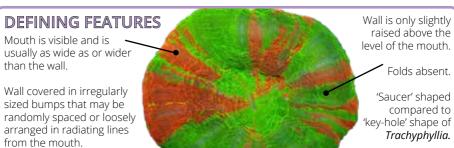


100-500,000
pieces
Global data 2010-2019

UK IMPORT PRICE
PER PIECE

OVER \$100





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*.





Colourful and popular

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



Taxonomic changes

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Scolymia australis



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

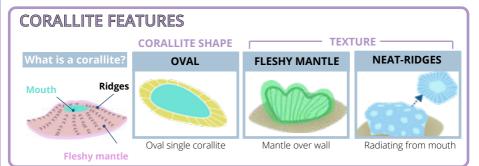
Cynarina

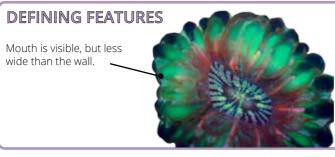


100-500,000
pieces
Global data 2010-2019

UK IMPORT PRICE
PER PIECE

BETWEEN \$21-\$99

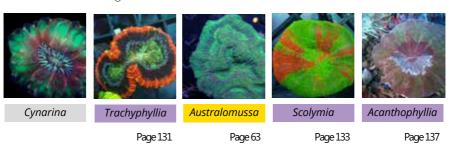




Wall has large radiating ridges that protrude slightly as rounded fingernail shapes, transparent fleshy mantle forms sausageshaped bubbles between ridges.

LOOK-ALIKES

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



Distinguishing features of Cynarina

Cynarina is distinguished by:

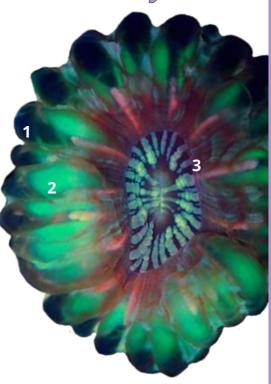
- 1. Fleshy mantle is transparent
- 2. Large lobed ridges visible through the fleshy mantle
- 3. Visible mouth is less wide than wall



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



CHECK GENUS

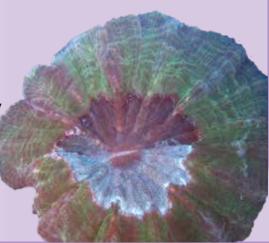


Acanthaphyllia is distinguished by:

- 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



CHECK GENUS



Acanthophyllia

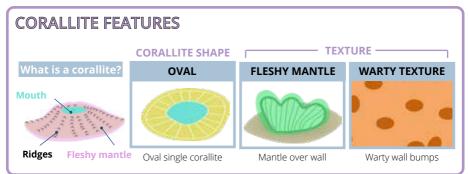


Under 100,000
pieces
Global data 2010-2019

\$8 \$270

UK IMPORT PRICE
PER PIECE

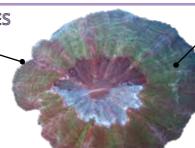
OVER \$100





Wall is covered in irregularly sized and irregularly arranged bumps.

wide than the wall.



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



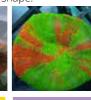
Trachyphyllia



Australomussa



Lobophyllia



Scolymia

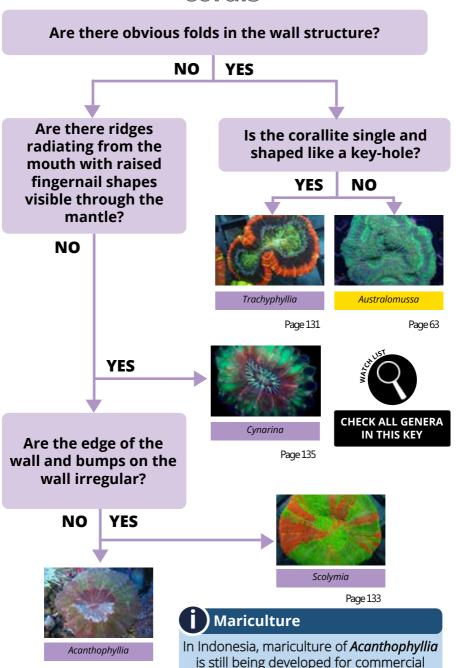
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Key for fleshy mantle solitary corals



trade.

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Fungia



Over 500,000 pieces

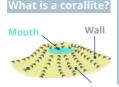
Global data 2010-2019

UK IMPORT PRICE
PER PIECE

BETWEEN \$21-\$99

TEXTURE -

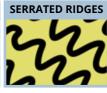
CORALLITE FEATURES





CORALLITE SHAPE





Ridges Oval single corallite

Wall ridges resemble Fungiidae corals.

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

Herpolitha

Heliofungia

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Page 143

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

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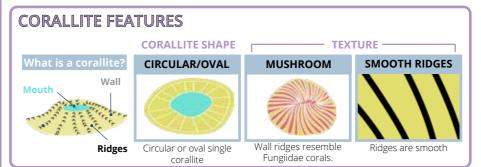
Cycloseris

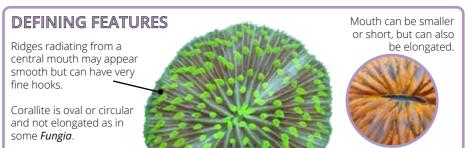


Under 100,000
pieces
Global data 2010-2019

UK IMPORT PRICE
PER PIECE

BETWEEN \$21-\$99





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*.



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Ridge structure in Fungiidae

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

Mariculture

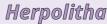
In Indonesia, mariculture of Cycloseris is still being developed for commercial trade.







Fungia







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



Under 100,000
pieces
Global data 2010-2019

\$6 \$15

UK IMPORT PRICE PER PIECE

BETWEEN \$2-\$20

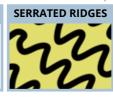
TEXTURE -











Ridges Elongate single or lobed multiple corallite

Wall ridges resemble Fungiidae corals.

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

Polyphyllia

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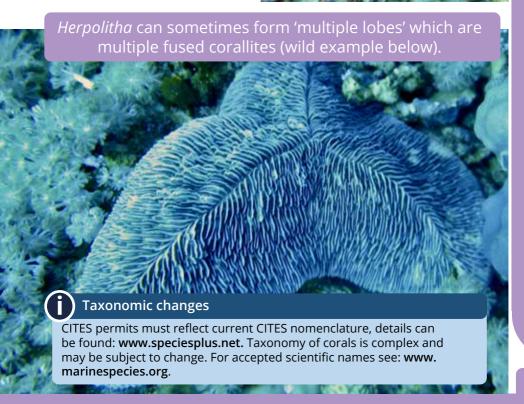
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Extra information on Herpolitha

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).





Polyphyllia

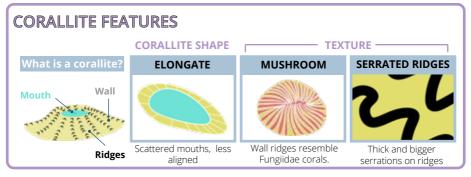


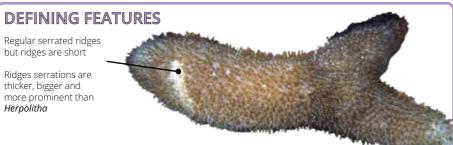
100-500,000
pieces
Global data 2010-2019

\$6 \$15

UK IMPORT PRICE
PER PIECE

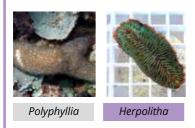
BETWEEN \$2-\$20





LOOK-ALIKES

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



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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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Photography credits: Adriel Prayoga (LINI), Gayatri Reksodihardjo-Lilley (LINI), Laura Carlin (EcoMarines), Yayasan Terumbu Karang Indonesia (TERANGI), The Indonesia Coral Reefs Working Group (ICRWG), Dr Suharsono, CV Cahaya Baru, CV Vivaria Marine, PT Aneka Tirtasurya, Dr Benjamin Cowburn (Cefas), Prof Dr Bert W. Hoeksema (Naturalis), Dr Beginer Subhan, Border Force, City of London, Dr Peter Coxhead.

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