Scleractinia Fauna of Taiwan

I. The Complex Group

台灣石珊瑚誌 Ⅰ. 複雜類群

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●General Introduction

Coral reefs are often recognized as the tropical rain forests in the sea due to their structural complexity, high primary productivity, and rich biodiversity. They are the major earth features determined by the complexly integrated operation of both organic and inorganic processes. The reef-building scleractinian corals have served as the foundation for complex reef ecosystems. Scleractinia constitutes an order of polypoidal marine invertebrates, along with sea anemones and octocorals, in the subclass Zoantharia, class Anthozoa of Phylum Cnidaria. Today, scleractinians include many of the solitary and colonial organisms in warm, well-lit tropical seas that populate and build reefs.

The taxonomy of Scleractinia has attracted much attention of geologists and biologists ever since Carl Linnaeus. Linnaeus (1758) placed Zoophytes in animal kingdom and included *Madrepora, Millepora, Tubipora,* and *Heliopora* under the category of Lithophytes. Among them, *Madrepora* is the representative of scleractinian corals. Following Linnean system of nomenclature, many taxonomic studies on scleractinians flourished in the nineteenth and twentieth centuries. Historically, the taxonomic studies of scleractinian corals can be divided into three periods: (1) the exploration period: representative publications include Lamarck (1816), Dana (1846-49), Edwards and Haime (1857-60), Quelch (1886), Brook (1893), Bernard (1896-1903), Crossland (1952); (2) the first Synthesis: representative publications are Vaughan and Wells (1943) and Wells (1956). These reviews provide the basic scheme of scleractinian classification and systematics in the twentieth century; (3) the modern period: representative publications include Veron and Pichon (1976, 1980, 1982), Veron et al. (1977), Veron and Wallace (1984), with Veron (1986, 2000) and Wallace (1999) representing the second synthesis of coral taxonomy. These publications are the major references of current coral taxonomy.

●Historical review

Taiwan is located on the northern border of 'coral triangle', the area with the highest coral diversity, which lies among the Philippines, Malaysia and Indonesia (Veron, 1996; Hoeksema, 2007). Although Taiwan lies near the northern latitudinal limit for the development of extensive fringing or barrier reef systems, its sublittoral areas possess coral communities that rival many of those found in lower latitudes in species diversity (Jones et al. 1972; Randall and Cheng, 1977, 1979; Dai, 1988). The scleractinian corals can be found along the northern, eastern, and southern rocky coasts and are lacking only on the western sandy coast. Scleractinians can also be found on the hard substrate at many offshore islands including Lanyu (Orchid Island), Ludao (Green Island), Xiaoliuchiu, Penghu Islands (The Pescadores), and a number of small islets from

the southernmost Taiping Island (Itu Aba Island, 114°22’E, 10°22’N) in the Spratlys to the northernmost Pengjiayu (Agincourt Island, 122°04'E, 25°38’N). However, there is a sharp gradient of scleractinian species diversity from south to north. In general, approximately 300 species of scleractinian corals can be found in southern Taiwan while only about 100 species can be found along the northern coast. This difference is mainly related to the seasonal variations of seawater temperatures (Dai et al. 1989; Chen 1999).

Most previous work dealing with recent coral reefs of southern Taiwan has been in the form of species checklists compiled from scleractinian coral collections. Yabe (矢部長克) and Sugiyama (杉山敏郎) (1936, 1937, 1941) and Eguchi (江口元起) et al. (1968) reported 102 species in 37 genera collected from Taiwan. Kawaguti (川口四郎, 1942, 1943) listed 78 species in 34 genera from Oluanpi (鵝鑾鼻) and compared the coral fauna there with collections from other localities in Taiwan. He also discussed the geographic distribution of corals in water around Taiwan and offshore islands. Kawaguti (1953) further revised the coral collections from Oluanpi and listed 87 species in 35 genera of scleractinians. Professor T. Y. H. Ma (馬廷英, 1899~1979) at Department of Geology, National Taiwan University is a pioneer studying corals in Taiwan. Although his main interest was the growth rates of corals inferred from growth rings of coral skeletons, he provided clear photos of more than 50 species of scleractinian corals (Ma, 1957, 1958, 1959).

Jones et al. (1972) conducted the first field survey on the coral reefs in southern Taiwan by scuba diving. They collected 340 coral specimens from the fringing reefs of Hengchun Peninsula and provided a list of 52 genera and 173 species, of which 121 are new to the study area. Subsequent investigations by Yang et al. (1976, 1977, 1982) increased the number to 245 species and 59 genera. However, most of these works only present a species checklist and a description of the coral fauna but include little systematic and ecological studies. Owing to the ambiguous status of coral taxonomy at that time, the species lists presented by the previous authors include numerous synonyms. Dai (1991) reported 230 species in 58 genera of scleractinian corals from southern Taiwan based on the taxonomic revisions of scleractinian corals (Veron, 1986; Veron and Pichon, 1976, 1980, 1982; Veron and Wallace, 1984; Veron et al. 1977). Subsequent reviews of the Scleractinia of Taiwan (Dai, 1989; Hoeksema and Dai, 1991; Dai and Lin, 1992; Wallace and Dai, 1997) further concluded the species diversity of corals in Taiwan waters. In recent years, several explorations have been conducted to reveal the status of marine biological resources in different areas of Taiwan. These surveys have revealed the general picture of species diversity and distribution of scleractinian corals in Taiwan waters (Table 1).

Table 1. Number of recorded scleractinian species in different areas of Taiwan.

Area	No. species	References
Southern Taiwan	280	Dai (2007)
Northern Taiwan	136	Dai et al. (2004)
Eastern Taiwan	210	Dai (2006)
Ludao (Green Island)	250	Dai (2006)
Lanyu (Orchid Island)	248	Dai (2006)
Xiaoliuchiu	239	Dai (2007)
Penghu Islands		
North	107	Hsieh (2008)
East	84	Hsieh (2008)
Inner Sea	75	Hsieh (2008)
South	99	Hsieh (2008)
Dongsha Atoll (Pratas Island)	229	Jeng et al. (2008)
Taiping Island (Itu Aba Island)	163	Dai and Fan (1996)
The Three Northern Islets	112	Dai (2008)

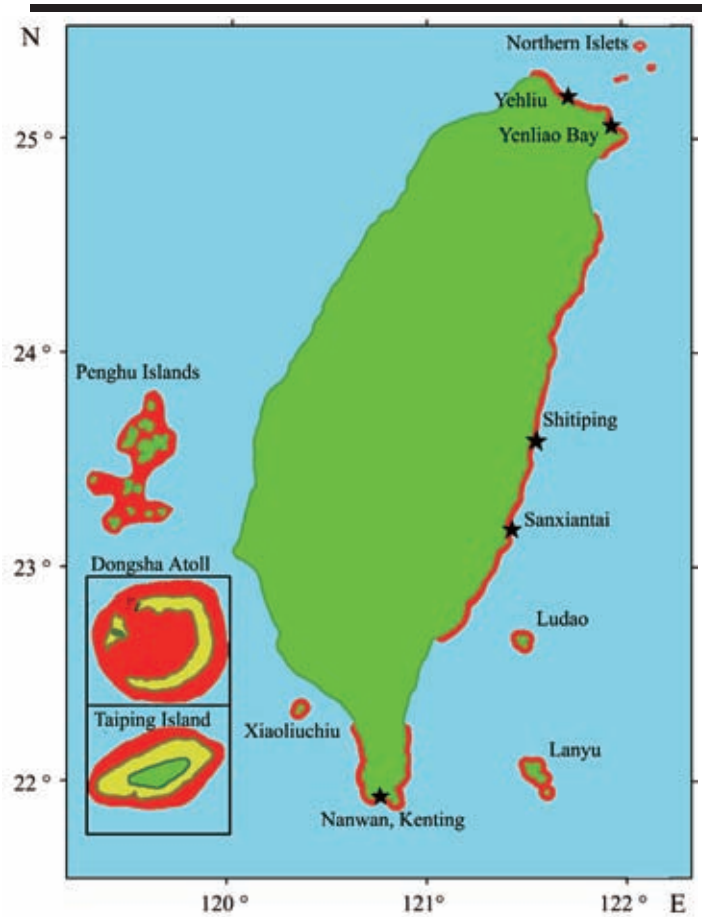


Fig. 1. Map of Taiwan showing the areas with reef, illustrated by the portion outlined in red.

●Basics for Coral Taxonomy

Scleractinian corals are classified primarily by skeletal characters. Different species are expected to be separated from each other by distinct morphological gaps. However, corals are highly plastic organisms and show considerable range of variation in their skeletal characters. The species problem in corals has been discussed by a number of authors ever since Quelch (1886). Quelch noted the extensive variations found within coral species and could be attributed to environmental factors. Since all coral species have so far been distinguished on morphological grounds, knowledge of variations induced by the environment is a prime concern when defining morphological boundaries between species. Unfortunately, discussions of phenotypic variation induced by environmental factors under the assumption of genetic homogeneity are not frequent for corals. Basically, there are three levels of variations: polyps within a coral colony, coral colonies in a local population, and coral colonies from different environments or localities.

The basic unit of coral animal is called a polyp. A polyp is soft-bodied and lives inside a solid cup-shaped skeleton called a corallite. The corallites and the underneath skeleton are made of calcium carbonate. Most polyps are small, from approximately 1 mm to 10 mm, and often live together in colonies; some large polyps are rather unusual and are often unattached and solitary. A coral colony is basically formed by multiplication of polyps through a process called budding where a polyp divides into two or more polyps (intratentacular budding) or where new polyps form on the side of the original polyp (extratentacular budding). A coral colony usually consists of thousands of genetically identical and interconnected polyps. When a colony grows, it gradually accumulates calcium carbonate and builds up skeletal mass to form a huge structure. Layers of carbonate skeleton are progressively laid down underneath the soft tissue. Therefore, only the outer veneer of a colony supports the soft-tissue of the polyps, the rest is dead skeletal material.

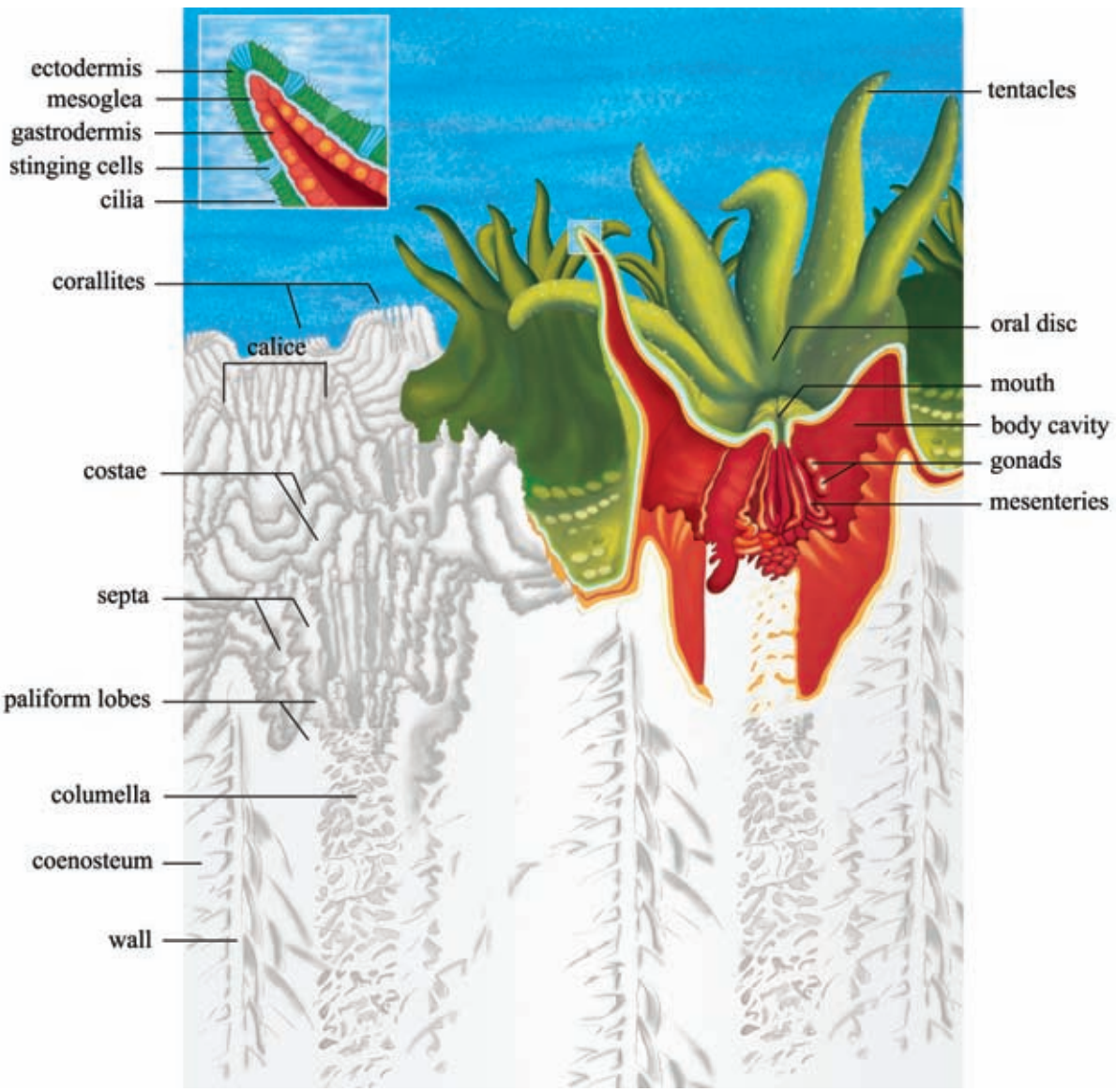


Fig. 2. The morphological features of scleratinian polyp and corallite (redrawn after Veron, 1986).

The structure of a polyps is quite simple. It is composed of a ring of tentacles and a tube-like body cavity. Tentacles are arranged in one or more rings and surrounding a slit-like mouth in the center. Tentacles are usually retractable and equipped with batteries of stinging cells (nematocysts) used for capturing food particles. Ingestion of food and expulsion of waste are through the mouth. The body cavity is divided radially by mesenteries extending inwards from the inner surface of the body wall. Mesenterial filaments are found along the inner edge of the mesenteries and they are used in digestion, excretion and are the site for gonads development during reproductive season.

Although the structure of coral polyps is simple, the morphology of skeletons is often complex and is the major characters for identifying coral species. A corallite is the hard part corresponding to a polyp. Each corallite contains vertical plates, called septa, that radiate from the center. The periphery of a corallite is the corallite wall and the extensions of septa outside the corallite wall are called costae. Some corals have vertical and pillar-like projections on the inner margin of the septa, these projections are the paliform lobes. In the center of a corallite is the columella. Corallites are joined together by horizontal plates called coenosteum and the corresponding part of living tissue is coensarc.

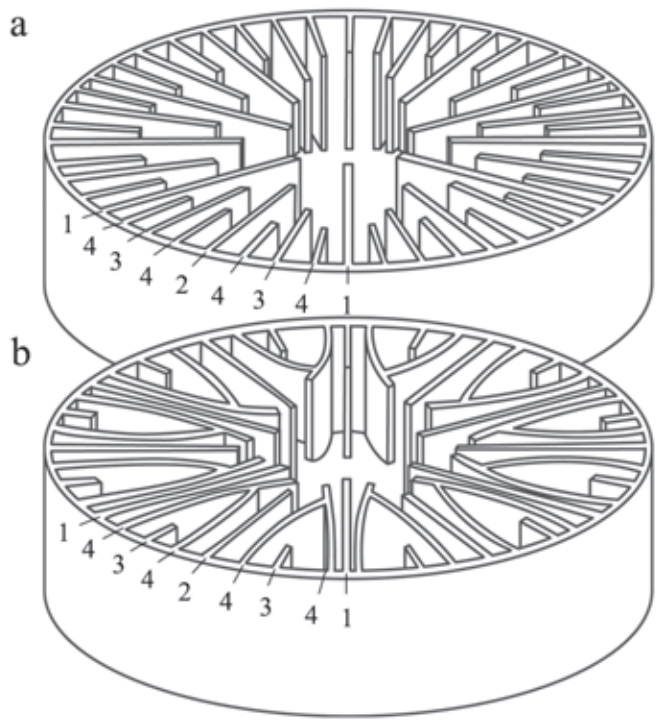


Fig. 3. Septal cycles in corals. (a) normal cyclical order. (b) Pourtalès Plan (redrawn after Veron, 1986).

The morphological features of septa play a key role in scleractinian classification. The septa may have several cycles. The first cycle septa, or the primary septa, are often the longest and most well-developed ones. The second, third, and fourth cycles of septa, if present, usually decrease in length gradually. The length of septa varies from species to species, usually written as the distance relative to the radius of the corallite. For example, primary septa ½R, indicate that the primary septa extend to half the radius of the corallites. Within most corallites, the first cycle has the largest septa, regressing to the fourth which has the shortest, however there is an exception to the rule where the fourth-cycle septa extend out past the third cycle septa and fuse, this is called Pourtalès Plan.

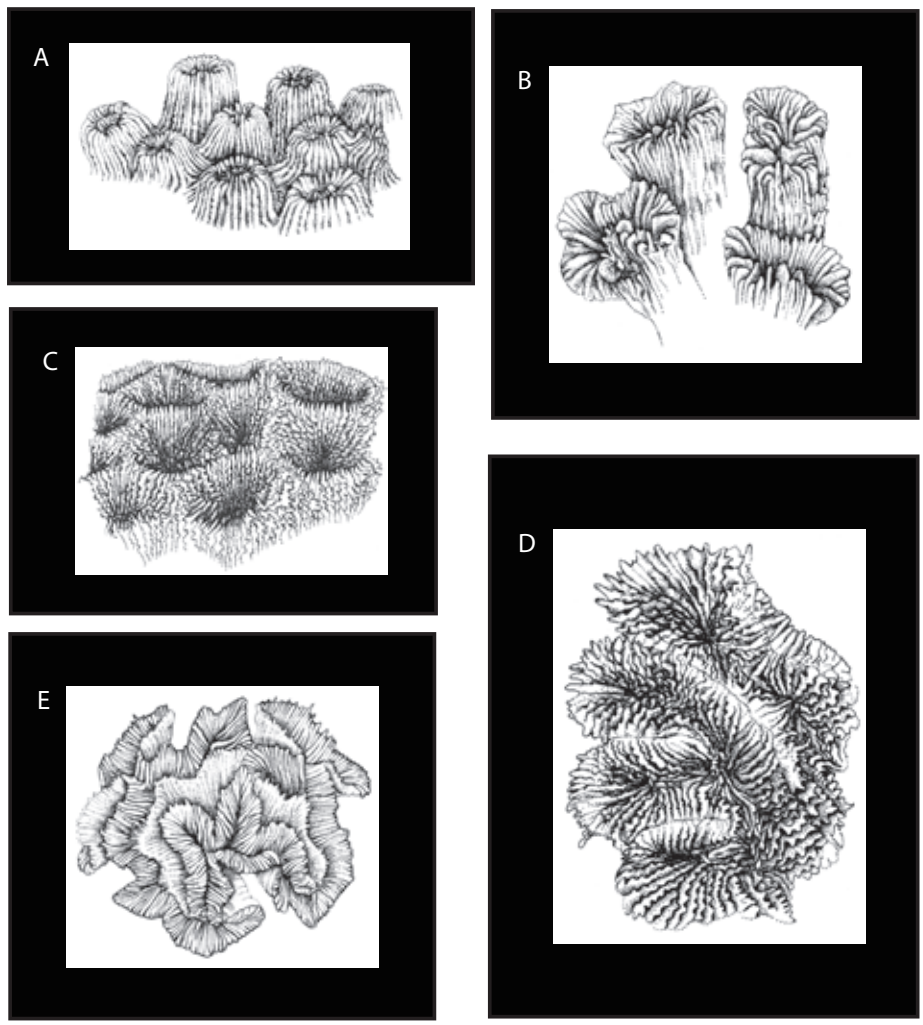


Fig. 4. The morphology of corallites in a colony. (a) plocoid; (b) phaceloid; (c) ceriod; (d) meandroid; (e) flabello-meandroid (redrawn after Veron, 1986).

The morphology or alignment of corallites in a colony is also an important feature for coral taxonomy. When corallites have their own walls they are called plocoid or phaceloid (where the latter is more elongate). It is called ceroid when adjacent corallites share walls and meandroid when the corallites unite to form valleys. When the valleys do not have a common wall, it is called flabello-meandroid.

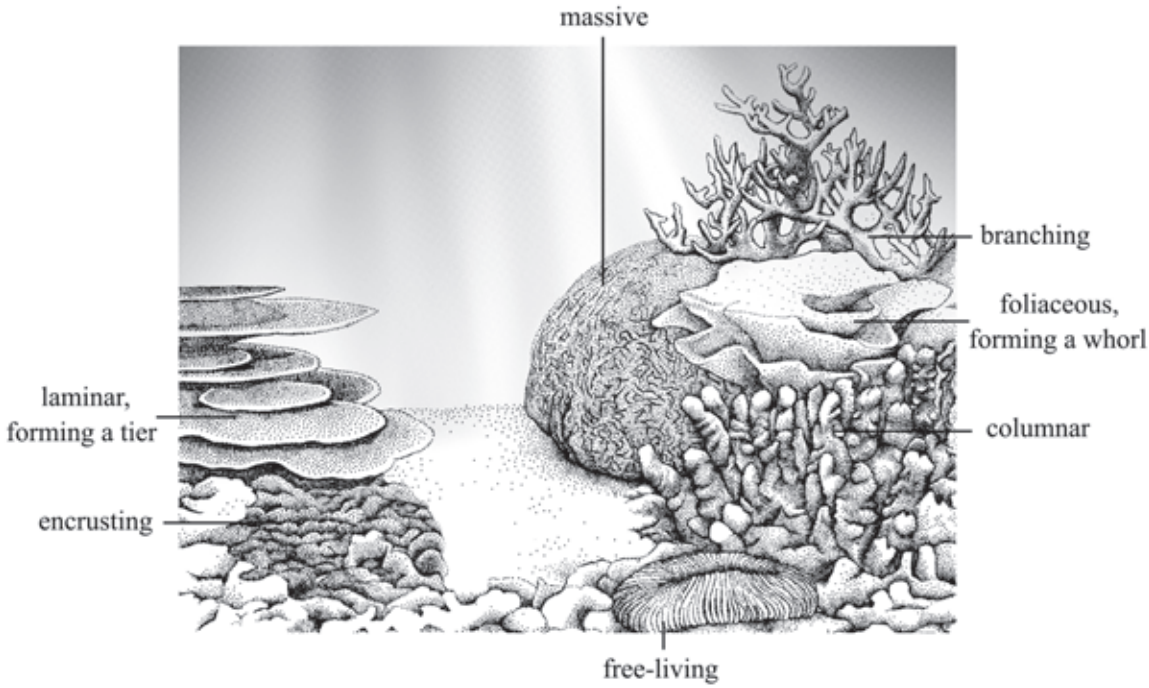
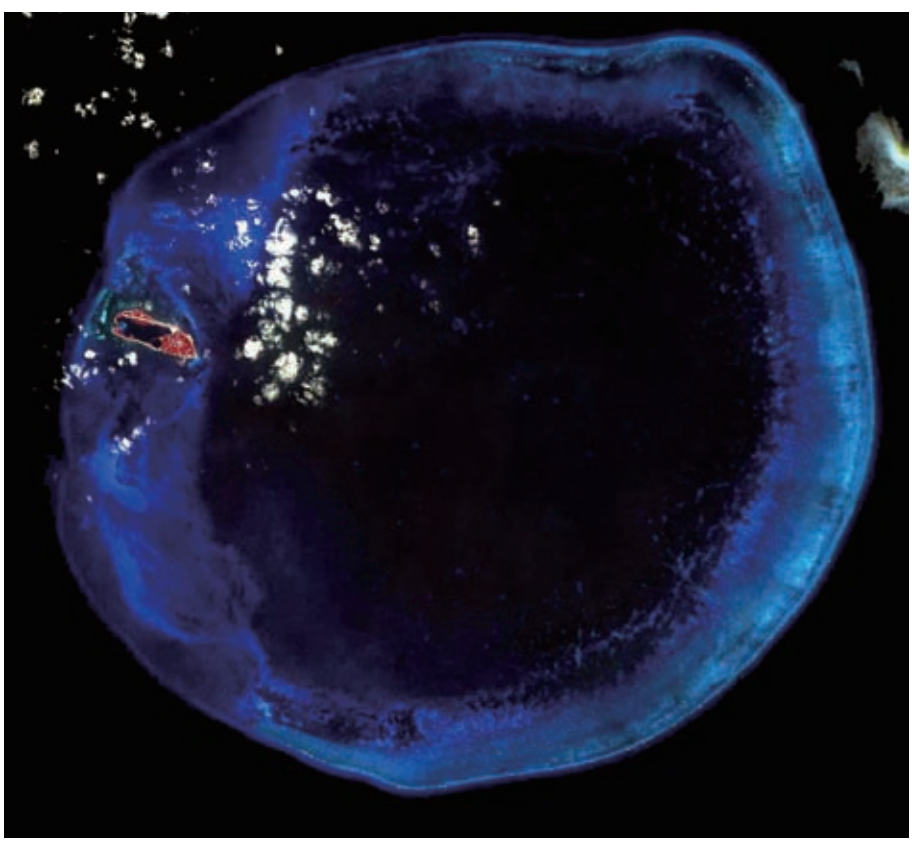


Fig. 5. Common growth forms of coral colonies (redrawn after Veron, 1986).

The shape of a coral colony often depends on the size of coral polyps, growth rates, mode of budding, and the influences of environmental factors. Major growth forms of coral colonies are: massive, columnar, encrusting, branching, foliaceous, laminar (or plate-like), and free-living. For most corals, colony shape is not genetically constrained and considerable morphological plasticity exists that allows them to adapt to different environmental conditions. For example, the variation in light intensity (e.g. shallow vs. deep habitat, clear vs. turbid water), and the strength of wave action often have profound effects on the morphology of coral colonies. Coral colonies grow on reef crest that are continually pounded by waves usually develop sturdy forms with short and stout branches. The same species on a lower slope with weaker wave action often have loose and delicate branches. Despite considerable morphological plasticity exists in coral colonies, there are still many characteristics which aid in coral taxonomy, although some knowledge of the habitat and water depth will greatly help the identification process of a coral specimen.

●Taxonomic Framework and Phylogeny

Scleractinian corals are relatively simple metazoans with a continuous fossil record dated back in the mid-Triassic. Traditionally, systematics of the Scleractinia has been based mainly on phenotypic characters derived from detailed studies of skeletal characters of both Recent and fossil corals. The phylogenetic hypothesis presented in Vaughan and Wells (1943) and further modified in Wells (1956) represents the most comprehensive and important scheme for modern coral taxonomy (Fig. 6). Based on this scheme, the Scleractinia are divided into five suborders (Asterocoeniina, Fungiina, Faviina, Caryophylliina, Dendrophylliina) and 33 families. Among them, twenty families are extant. The oldest coral fossils in the mid-Triassic represented two major lines that subsequently gave rise to the five suborders. The first major line evolved independently into the suborder Asterocoeniina. This suborder is today represented by four families, including the most speciose Acroporidae. The Acroporidae is composed of colonial, reef-building corals characterized by small corallites and porous skeleton that often grow rapidly to form large colonies. These characteristics are thought to have led this group being the most successful of all Scleractinia today. The second major line gave rise to the other four suborders including Fungiina, Faviina, Caryophylliina, and Dendrophylliina. Among them, the Fungiina and Faviina were distinct from each other by the late Triassic. Then, the Fungiina gave rise to the Caryophylliina in the Jurassic, and the latter gave rise to the Dendrophylliina in the Cretaceous. The four suborders contain both reef-building and non-reef-building corals, although the former is dominant.



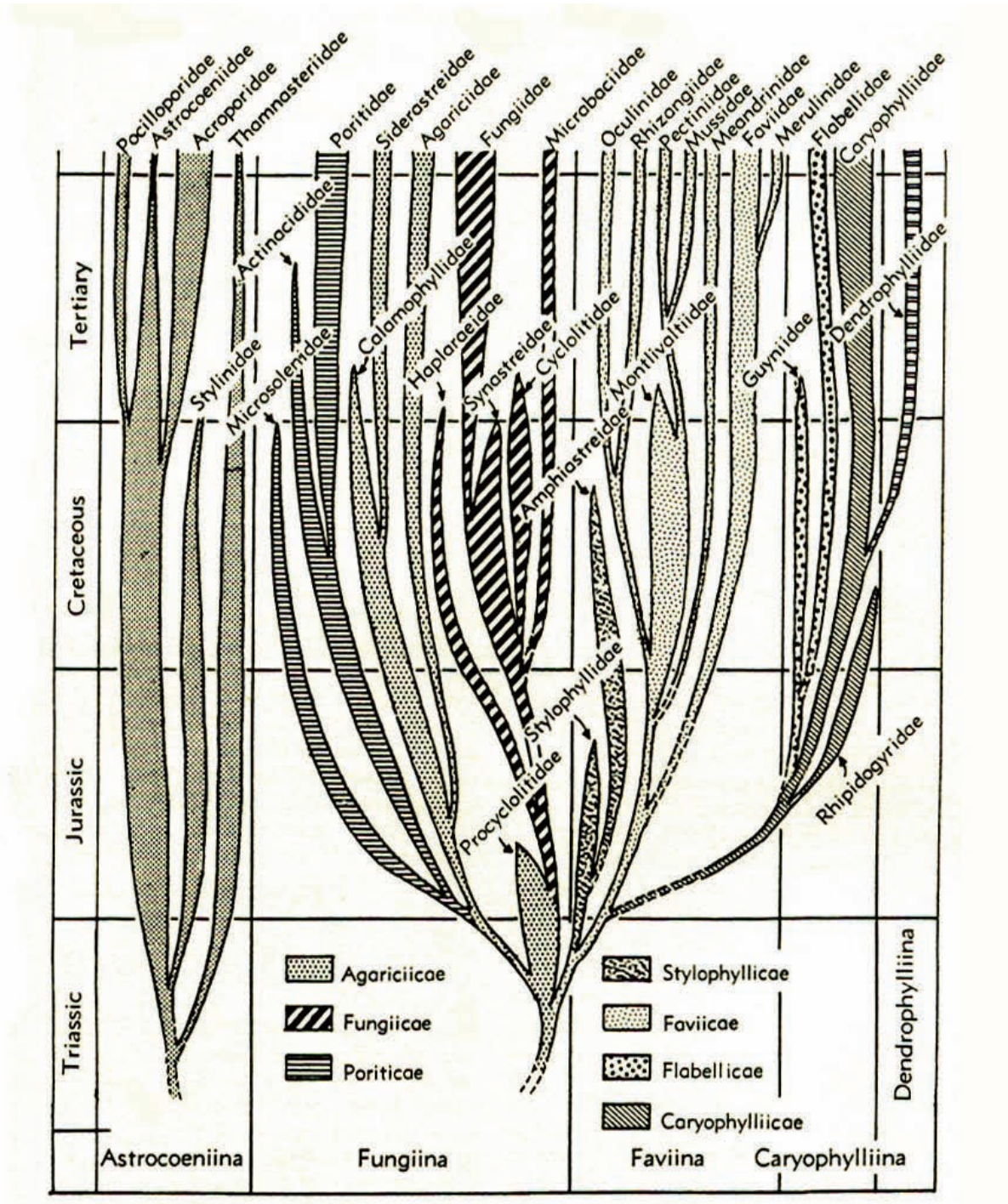


Fig. 6. The five suborders systems and evolutionary relationships among scleractinian corals proposed by Wells (1956).

A major revision to the phylogenetic hypothesis of Scleractinia (Wells,1956) was provided by Veron (1995, 2000; Fig. 7). It is based on the morphological characters of both recent and fossil corals collected ever since Vaughan and Wells (1943) as well as the complete morphological data of both living tissue and coral skeleton achieved by in situ studies (Veron and Pichon, 1976, 1978, 1982; Veron et al. 1977; Veron and Wallace, 1984). The scheme provided in Veron (1995) divides the Scleractinia into 13 suborders with 59 families, of which 7 suborders and 24 families are extant. The 7 extant suborders include those of Wells (1956) and two groups (Poritiina, Meandriina) that he elevated to suborder status. However, Veron (1995) proposed no hypotheses about the relationships among suborders and few hypotheses for relationships among families.

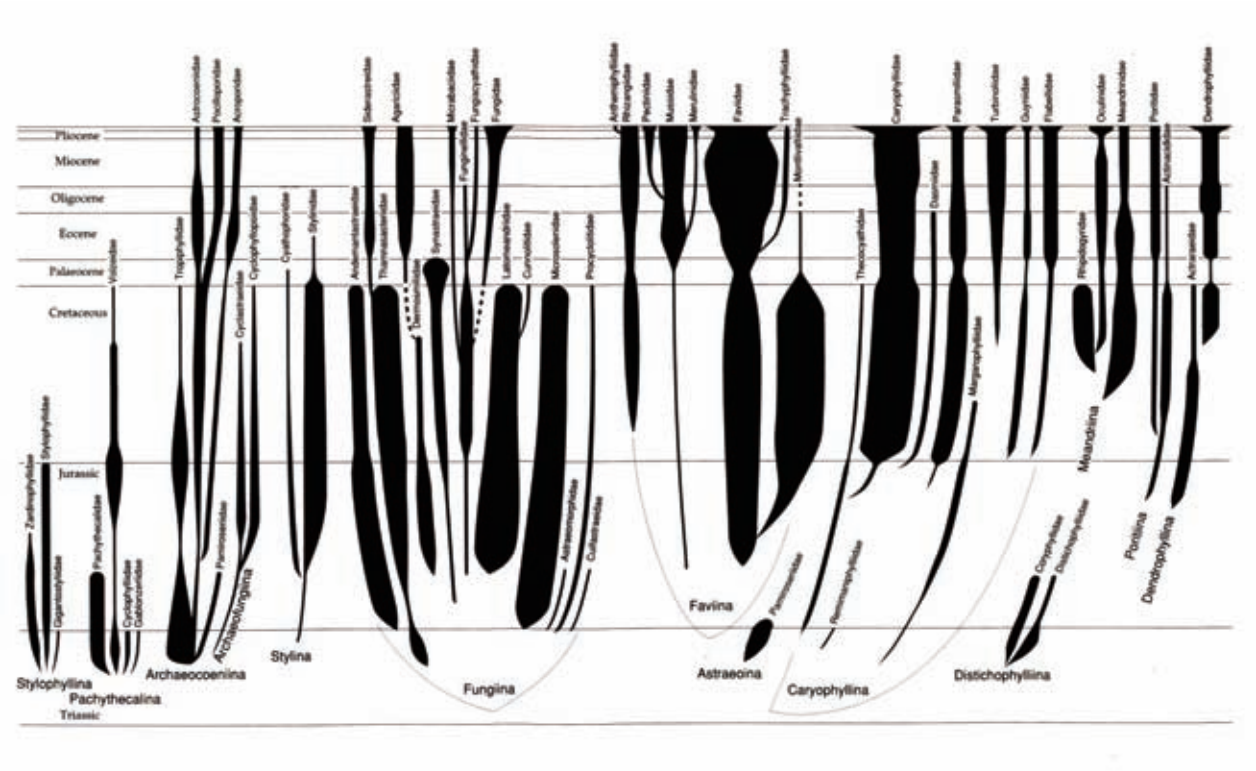


Fig. 7. The seven extant suborders system and evolutionary relationships among scleractinian corals proposed by Veron (1995).

Molecular analyses have been used to study higher-level relationships among the Scleractinia only recently. The pioneer study of Romano and Palumbi (1996, 1997) based on molecular phylogenetic analysis of mitochondrial 16S ribosomal RNA showed that the Scleractinia could be clustered into two major groups ('complex' and 'robust' corals) that did not correspond to morphologically based suborders. Subsequent studies using more species and different molecular markers also support this phylogenetic scheme of Scleractinia (Romano and Cairns, 2000; Chen et al. 2002; Fig. 8).

Fukami et al. (2008) further expanded the study by analyzing 127 species representing 75 genera and 17 families in Scleractinia and based on the analyses of two mitochondrial genes (cytochrome oxidase I, cytochrome b) as well as nuclear genes (ß-tubulin, ribosomal DNA) to test the proposed phylogenetic relationships. Their results showed that the molecular data did not support the five suborder classification of Wells (1956) and the seven suborder classification of Veron (1995). However, their results did support the two clades phylogeny of Scleractinia and some of the relationships within the suborder Faviina, between the families Poritidae and Dendrophylliidae, and for genera within families. They further suggested that scleractinian suborders as currently defined need to be reexamined.

One of the major clade, the "robust" corals, consists largely of taxa with relatively solid, heavily calcified skeletons that result from the solid (septothecal or parathecal) construction of corallite walls. Colonies are largely platelike or massive (although there are some ramose genera). Many grow by intratentacular budding, which is thought to be related to coral shape .

The other clade consists of "complex" corals. These corals, except for the Oculinidae, tend to be less heavily calcified, perhaps as a result of the relatively porous (synapticulothecal) construction of corallite walls. In addition, in all but one of the taxa in this clade, the septal walls are built from simple trabeculae that form a relatively porous and loose network of skeletal elements, resulting in a relatively light, complex architecture. Colonies often occur as ramose forms (growing as bushes, thickets, or tables) but also exhibit digitate, columnar, lamellate, and platelike forms. Four of the six families of complex corals grow by extratentacular budding, which may help form architecturally complex skeletons. This clade is exemplified by the genus *Acropora*, which has the greatest number of species and the widest range of growth forms of any coral genus.

Fukami et al. (2008) also suggested that among the 16 traditional families of scleractinian corals, at least 11 are polyphyletic as currently defined: Mussidae, Faviidae, Pectiniidae, Merulinidae, Siderastreidae, Astrocoeniidae, Euphylliidae, Meandrinidae, Poritidae, Agariciidae, and Oculinidae. Five of these (Oculinidae, Euphylliidae, Meandrinidae, Siderastreidae, Astrocoeniidae) have members placed in both of the highly divergent ‘‘complex’’ and ‘‘robust’’ subgroups. They further suggested a taxonomic revision of Scleractinia into 15 families. This suggestion is followed in this revision. Taxonomic scheme of families and genera of this revision is shown in Table 2.

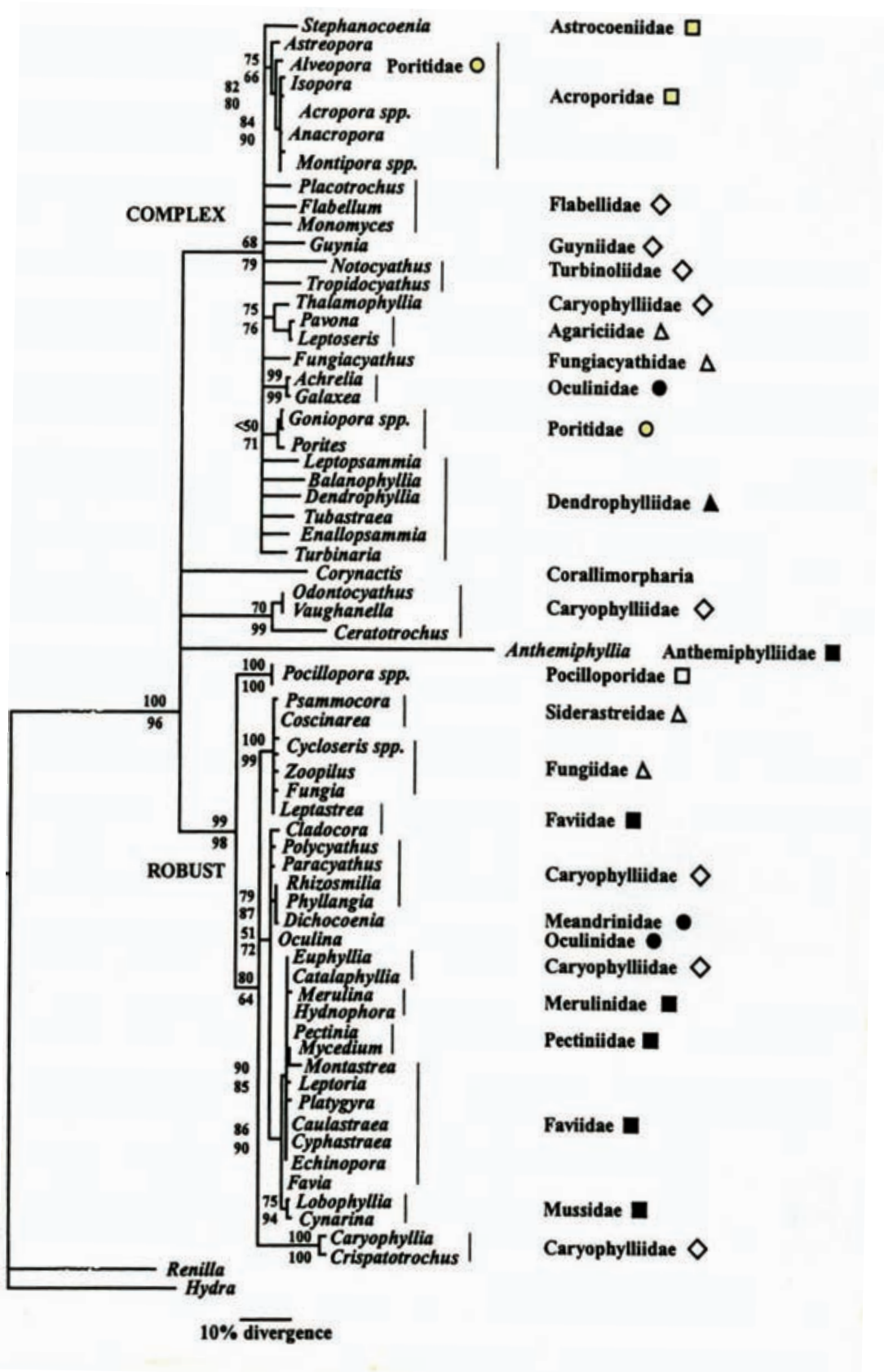


Fig. 8. Phylogenetic tree based on the mitochondrial 16S rRNA gene from 68 species of scleractinians. Symbols indicate different suborders (adapted from Romano and Cairns, 2000).

Table 2. The systematic scheme of Scleractinia fauna of Taiwan

Clade	Families	Genera
Complex clade	Acroporidae	*Montipora, Acropora, Anacropora, Isopora, Astreopora, Alveopora*
	Poritidae	*Porites, Goniopora*
	Agariciidae	*Pavona, Leptoseris, Gardineroseris, Coeloseris, Pachyseris*
	Euphylliidae	*Euphyllia, Galaxea, Acrhelia*
	Siderastreidae	*Siderastrea, Pseudosiderastrea*
	Dendrophylliidae	*Turbinaria, Tubastraea*
Robust clade	Pocilloporidae	*Pocillopora, Seriatopora, Stylophora, Stylocoeniilla*
	Fungiidae	*Fungia, Ctenactis, Herpolitha, Heliofungia, Polyphyllia, Podabacia, Lithophyllon, Sandalolitha, Coscinaraea, Psammocora, Leptastrea, Oulastrea*
	Lobophylliidae	*Echinophyllia, Oxypora, Scolymia, Australomussa, Lobophyllia, Symphyllia, Acanthastrea, Cynarina*
	Plesiastreidae	*Plesiastrea, Physogyra, Plerogyra, Blastomussa*
	Agathiphylliidae	*Diploastrea*
	Faviidae	*Favia, Favites, Goniastrea, Barabattoia, Cyphastrea, Caulastrea, Echinopora, Leptoria, Montastraea, Platygyra, Oulophyllia, Merulina, Hydnophora, Scapophyllia, Mycedium, Pectinia, Trachyphyllia*

Family Acroporidae Verrill, 1902

Family Acroporidae is composed of six extant genera, including *Acropora*, *Montipora*, *Astreopora*, *Isopora*, *Anacropora*, and *Alveopora*. *Acropora* and *Montipora* are the two largest genera. There are more than 130 species worldwide in the genus *Acropora*, and more than 30 species are recorded in Taiwan. *Montipora* is the second largest genus, with nearly 90 species worldwide, and nearly 30 of them are recorded in Taiwan. With their large number of species, the importance of these two genera is thus evident. Genus *Alveopora* originally belonged to the Family Poritidae due to their morphological similarities, but recent molecular analyses suggest that *Alveopora* should be moved to the Family Acroporidae.

All Acroporidae species have very small corallites, approximately 1 mm in diameter, with very simple and reduced skeletal structures in the corallites and no columella; except for *Astreopora*, of which the corallites are larger, and may form a rudimentary columella. They are colonial, with no solitary species, and colonies display a wide variety of growth forms. *Acropora* species are mostly branching, usually arborescent, but some species may have branches which fuse to be plate-like or tabular. *Montipora* species are usually foliaceous or encrusting, but some species may be branching, columnar or massive. *Astreopora* species are mostly massive. *Alveopora* species have large and fleshy polyps with 12 tentacles, and are normally extended day and night.

In modern reefs, Acroporidae species are the crucial reef-building species, and they may be perceived as the index species of coral reefs. Reefs lacking Acroporidae species indicate impaired ecological functions and that the reefs are in an unhealthy state.

Simplified key to genera of Acroporidae

Colonies with large, fleshy polyps..... *Alveopora*

Colonies without large, fleshy polyps

- Colonies massive ..... *Astreopora*
- Colonies foliaceous ..... *Montipora*
- Colonies branching
  - With pore-like corallites..... *Montipora*
  - Corallites are dimorphic: one axial and multiple radial corallites ..... *Acropora*
  - Corallites are dimorphic: multiple axial and radial corallites ..... *Isopora*
  - Corallites slightly protuberant, no axial corallites ..... *Anacropora*

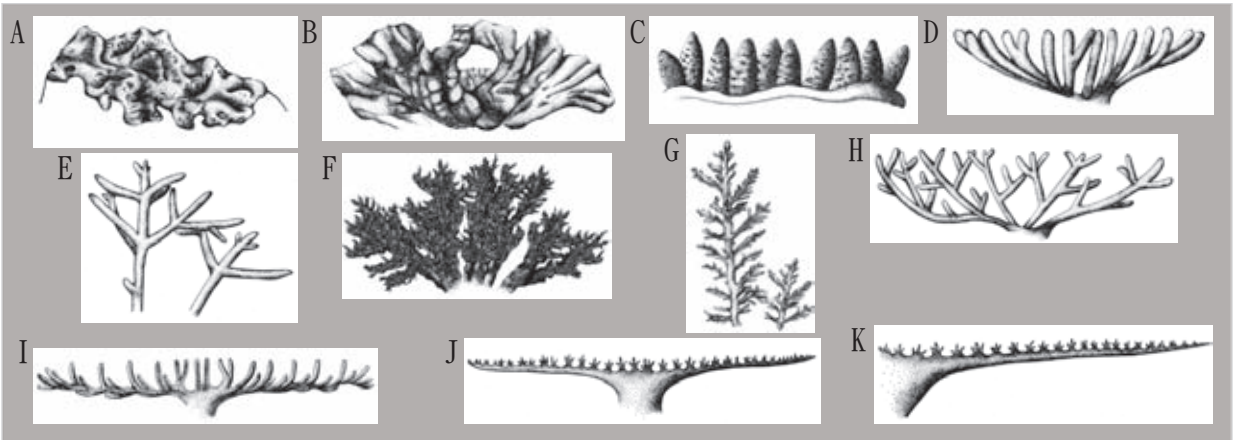


Fig. 9. Growth forms of *Acropora*. (a) encrusting; (b) cuneiform; (c) digitate; (d) corymbose; (e) arborescent; (f) caespitose; (g) hispidose; (h) caespito-corymbose; (i) arborescent table; (j) table; (k) plate (redrawn after Wallace, 1999).

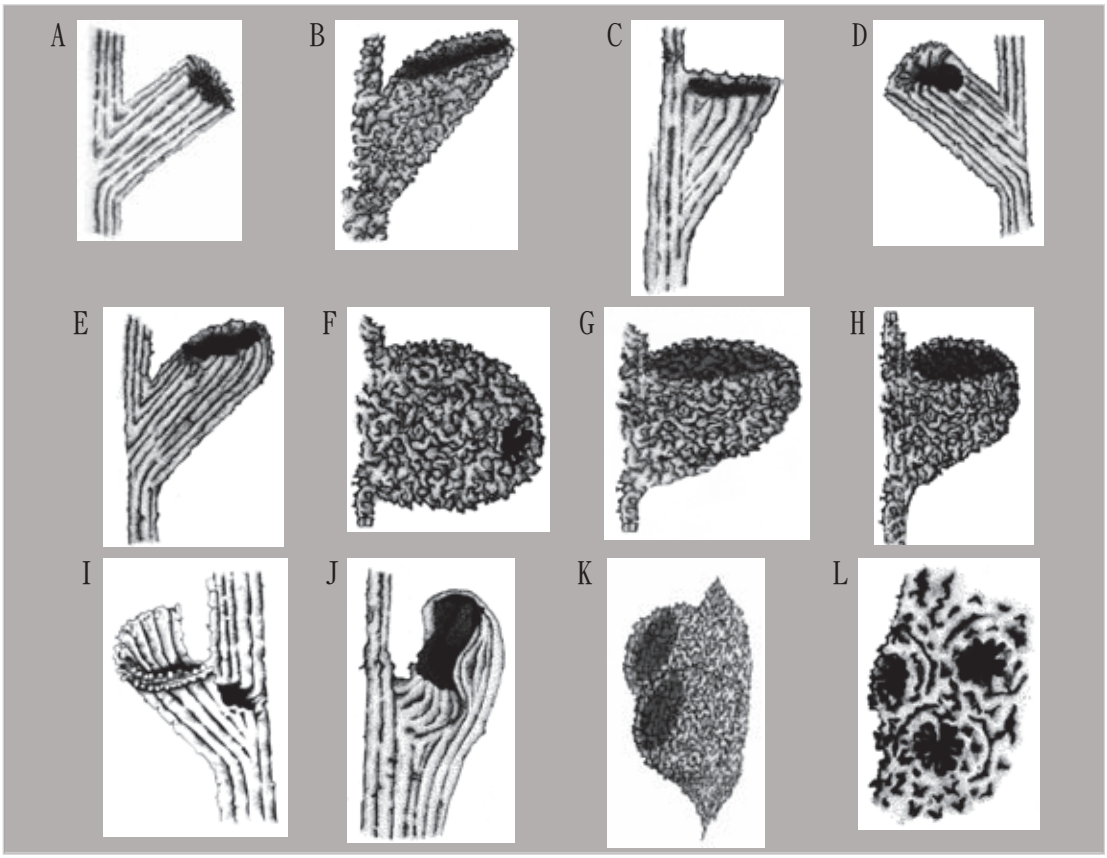


Fig. 10. Radial corallite shapes of *Acropora*. (a) tubular, round opening; (b) tubular, oblique opening; (c) appressed tubular; (d) tubular, dimidiate opening; (e) tubular, nariform opening; (f) rounded tubular; (g) nariform, elongate opening; (h) nariform, round opening; (i) labellate, flaring lip; (j) cochleariform; (k) sub-immersed; (l) immersed (redrawn after Wallace, 1999).

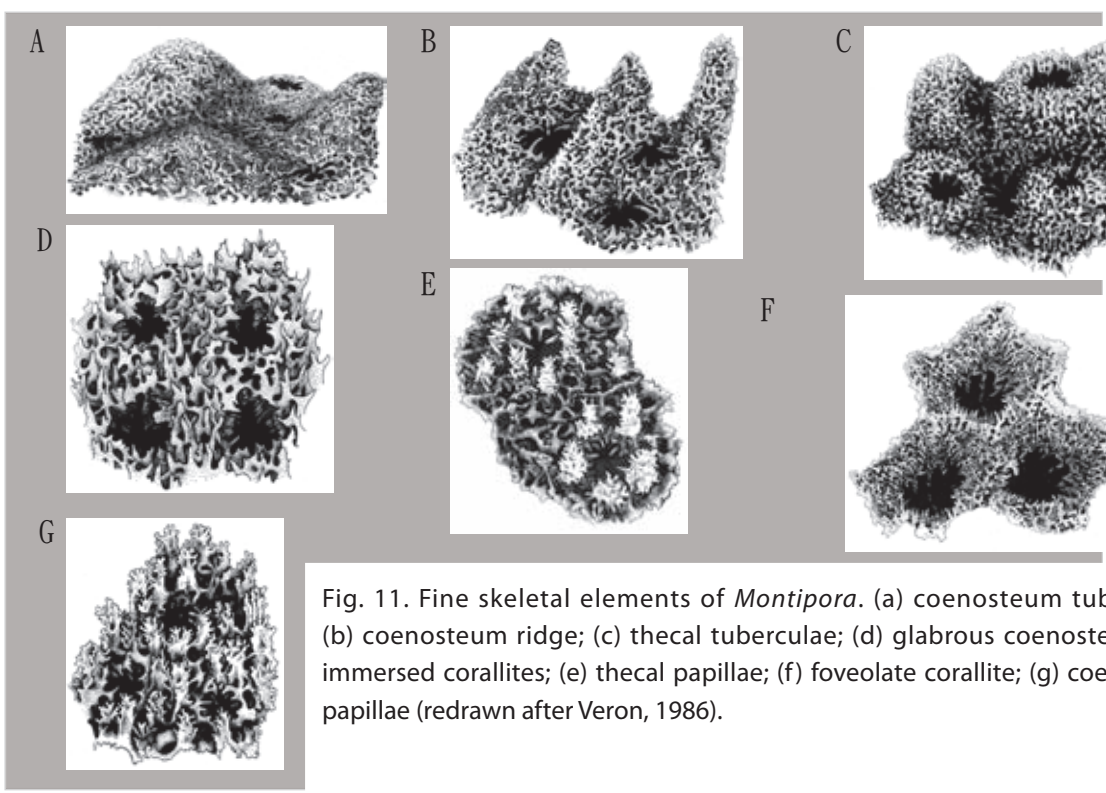


Fig. 11. Fine skeletal elements of *Montipora*. (a) coenosteum tuberculae; (b) coenosteum ridge; (c) thecal tuberculae; (d) glabrous coenosteum with immersed corallites; (e) thecal papillae; (f) foveolate corallite; (g) coenosteum papillae (redrawn after Veron, 1986).

Montipora monasteriata (Forskål, 1775)

Chinese Name 單星表孔珊瑚
Family Acroporidae
Publication *Madrepora monasteriata* Forskål (1775)
Synonymy *Montipora monasteriata* (Forskål); Crossland (1941); Boschma (1951); Ma (1959); Pillai (1967b). Veron & Wallace (1984); Veron (1986); Nishihira & Veron (1995); Veron (2000)
Montipora tuberculosa (Lamarck); Klunzinger (1879); Hoffmeister (1925); Wells (1954)
Montipora lanuginosa Bernard (1897); Yabe & Sugiyama (1935); Ma (1959)
Montipora sinensis Bernard (1897); Yabe & Sugiyama (1935); Ma (1959); Zou (1975)

Taxonomic Description & Diagnosis

Coralla are massive or thick plates, which may be bifacial.

Corallites are evenly distributed and of uniform size. Calices are 0.6-0.7 mm in diameter. Except on concave surface where corallites arevseparated only by coarse spongy reticulum, the reticulum is coarse and uniformly covered with papillae and/or tuberculae 0.4-1.5 mm in diameter. Corallites may become sub-foveolate if papillae and/or tuberculae are sufficiently fused, they may also fuse into short ridges perpendicular to the corallum margin on flat surfaces. All papillae and tuberculae are composed of fine reticulum with elaborated spinules.

Coralla from environments protected from strong wave action have corallites with relatively well-developed septation and small papillae. Those exposed to strong wave action have tuberculae rather than papillae, which are broad and highly fused.

Living colonies are usually pale brown or pink in color, with pink or white margins.

Occurrence

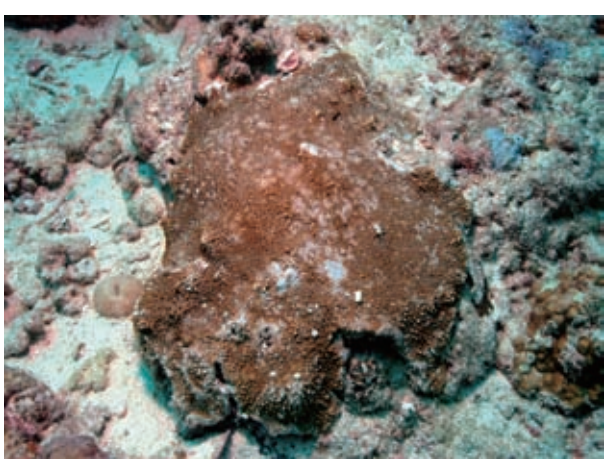
All reef areas around Taiwan and offshore islets.

Distribution

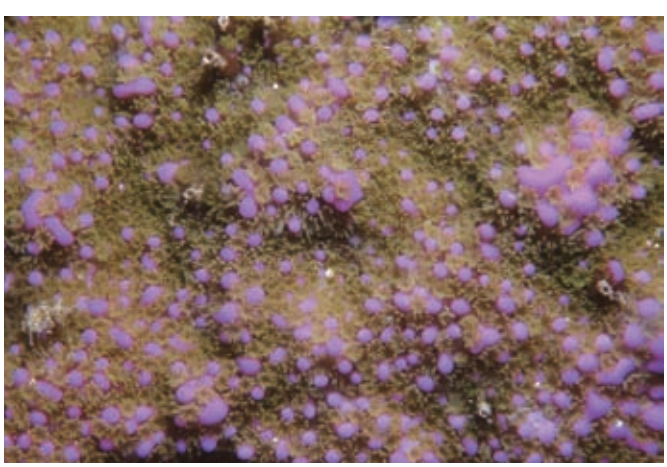
Widespread throughout the Indo-Pacific, from the Red Sea in the west to Hawaii in the east.

Remarks

Montipora monasteriata may be similar to *M. tuberculosa*. The latter has smaller corallites and smaller tuberculae/papillae which are fused into thecal tubes.



A submassive colony of *Montipora monasteriata* (Dongsha).



A close-up view of polyps and papillae. (x 2)

Montipora aequituberculata Bernard, 1897

Chinese Name 瘦葉表孔珊瑚

Family Acroporidae

Publication *Montipora aequituberculata* Bernard (1897)

Synonymy *Montipora aequituberculata* Bernard (1897); Veron & Wallace (1984); Veron (1986); Nishihira & Veron (1995); Veron (2000)

Montipora composita Crossland (1952); Wells (1954); Pillai (1967b); Scheer & Pillai (1974).

Taxonomic Description & Diagnosis

Colonies are foliaceous, composed of thin, flat to contorted lamina, which are often arranged in oblique overlapping whorls.

Calices are 0.4-0.8 mm in diameter. Corallites are exsert to immersed, surrounded by thecal papillae which are highly fused. Fused thecal papillae may form long fine ridges perpendicular to the margins of thin laminae, while being absent from thicker laminae. Or they may form fused cones near the base of laminae. The ridges often form hoods over peripheral corallites which are strongly outwardly inclined.

Reticulum papillae are thick and highly fused, with highly elaborated spinules. Similar spinules may cover the reticulum, giving all coenostial structures a uniform frosted appearance.

Living colonies are usually uniform brown or purple in color.

Ecology

Montipora aequituberculata is one of the most abundant and widespread *Montipora*, also one of the most polymorphic. It is common in shallow reef environments, may be dominant on sheltered reef slopes.

Occurrence

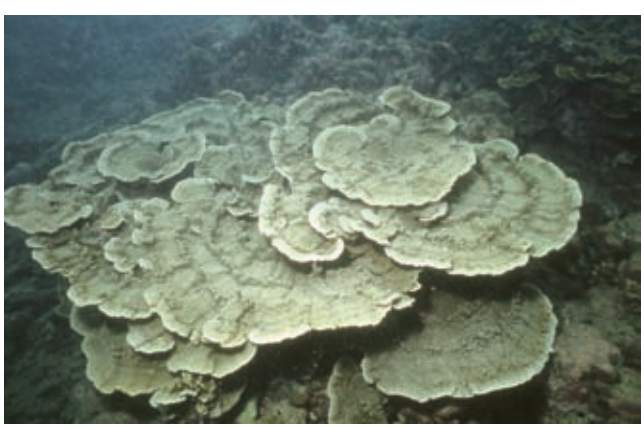
All reef habitats from southern to northern Taiwan

Distribution

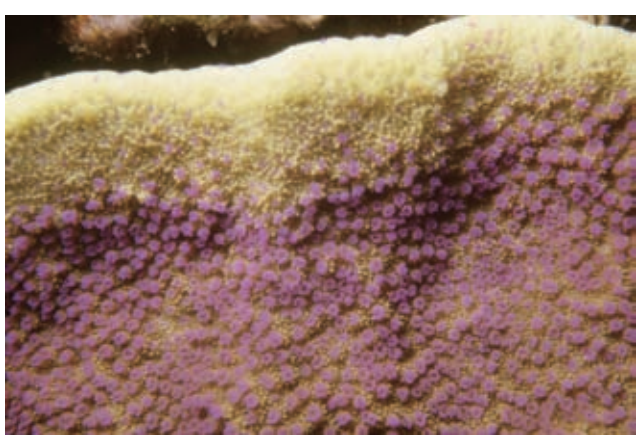
Widely distributed throughout the Indo-Pacific, from East Africa and the Red Sea east to the Pitcairn Islands

Remarks

Montipora aequituberculata highly resembles *M. foliosa* with the same growth form and general appearance, but the reticulum ridges, so characteristic of *M. foliosa*, are poorly developed.



A laminar colony of *Montipora aequituberculata* (Penghu).



A close-up view showing polyps (in red) and papillae (in yellow). (x 2)

Montipora altasepta Nemenzo, 1967

Chinese Name 直枝表孔珊瑚
Family Acroporidae
Publication *Montipora altasepta* Nemenzo (1967)
Synonymy *Montipora altasepta* Nemenzo (1967); Veron (1986); Nishihira & Veron (1995); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are branching, usually occurs in clumps of thin branches with a diameter of 5-6 mm. These upright branches are often irregularly fused at the base.

Corallites are mostly immersed, but have projecting lower lips, thus the surface has a rasp-like appearance underwater.

Living colonies are usually brown or grey, sometimes with white tips.

Distribution

M. altasepta is commonly found in shallow protected reef slopes, usually occurs in protected lagoons or in sandy areas surrounding coral reefs.

Occurrence

Nanwan Bay, Southern Taiwan

Distribution

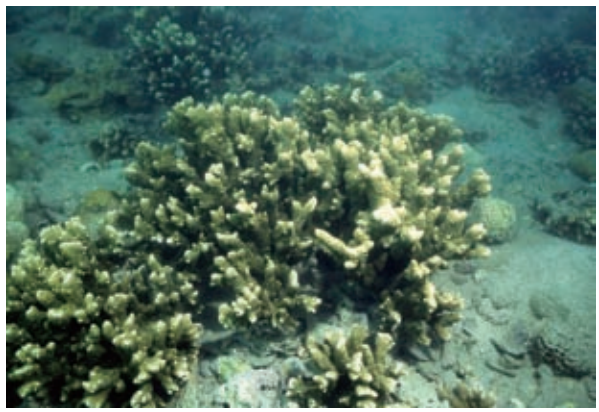
Distributed in western and central Pacific, east from Indonesia to Fiji in the west

A large branching colony of *Montipora altasepta* on sandy bottom (Nanwan).

Branches of *Montipora altasepta.* (x 2)

Montipora cactus Bernard, 1897

Chinese Name 仙掌表孔珊瑚
Family Acroporidae
Publication *Montipora cactus* Bernard (1897)
Synonymy *Montipora cactus* Bernard (1897); Nemenzo (1967); Veron (1986); Nishihira & Veron (1995); Veron (2000)



Branching colonies of *Montipora cactus*.

Taxonomic Description & Diagnosis

Colonies are submassive or form tall columns and branches with laminar bases. Corallites are mostly exsert. The coenosteum is densely covered by papillae of uniform length. Living colonies are brownish, coenosteum papillae usually have white tips, especially on distal parts of branches.

Ecology

They are commonly found in sheltered environments, especially sheltered lagoons with turbid water and soft substrates. Those found in turbid water are usually laminar and digitate, while submassive and columnar forms occur on reef slopes.

Occurrence

Southern Taiwan, Penghu Islands.

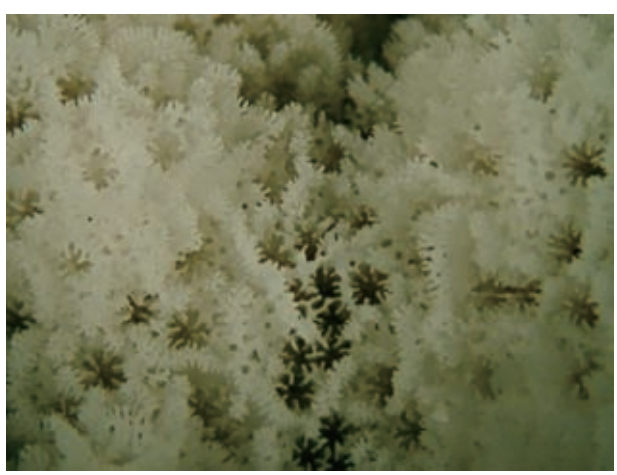
Distribution

Distributed in the west Pacific, from Indonesia in the south, to Okinawa-jima in the north.

Remarks

Montipora cactus resembles *Montipora hispida*, both having a similar general appearance, but is readily distinguished by the tall thecal papillae on its corallites.

A close-up view of branches.



Corallites and coenosteum of *Montipora cactus.* (x 5)

Montipora danae Edwards & Haime, 1851

Chinese Name 圓突表孔珊瑚
Family Acroporidae
Publication *Montipora danae* Edwards & Haime (1851)
Synonymy *Montipora danae* Edwards & Haime (1851); Bernard (1897); Wells (1954); Ma (1959); Nemenzo (1967); Veron & Wallace (1984); Veron (1986); Nishihira & Veron (1995); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are massive, sub-massive, columnar or plate-like, with surface covered with verrucae. Corallites are immersed and situated between verrucae. Columnar colonies have larger and less regular verrucae, while those on massive and sub-massive coralla are contorted and fused into irregular shapes. Plate-like colonies from deep or turbid water tend to have verrucae that are elongate, often fused into long low and widely separated ridges perpendicular to the plate margins, corallites are thus arranged in radiating row.

Calices are 0.6-0.7 mm in diameter. The reticulum is fine and is covered with spinules with elaborated tips.

Living colonies are usually brown or pale blue with paler margins. Polyps are often brightly colored.

Occurrence

All reef areas around Taiwan, except northern Taiwan.

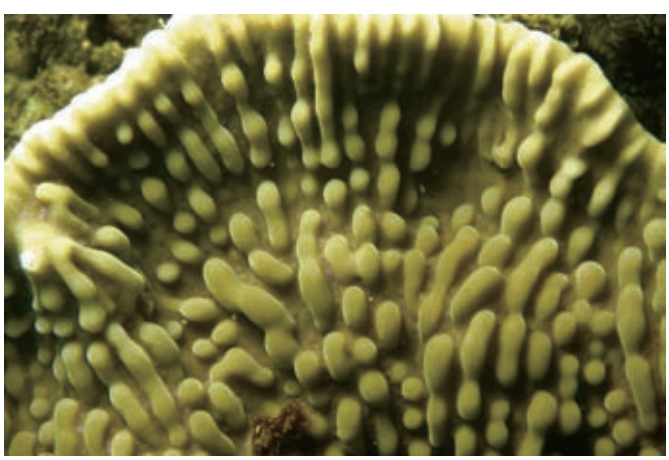
Distribution

Widely distributed from the Red Sea east to the Marshall Islands and French Polynesia.

Remarks

Montipora danae is closest to *M. verrucosa*. It is distinguished by its wider range of growth forms, smaller corallites, and more irregular verrucae. Calices of *M. danae* are shallow while those of *M. verrucosa* are relatively large, open and deep.

A plate-like colony of *Montipora danae* (Nanwan).



A close-up view of verrucae and corallites. (x 2)

Montipora efflorescens Bernard, 1897

Chinese Name 斑疹表孔珊瑚
Family Acroporidae
Publication *Montipora efflorescens* Bernard (1897)
Synonymy *Montipora efflorescens* Bernard, 1897; Eguchi (1938); Veron & Wallace (1984); Veron (1986); Nishihira & Veron (1995); Veron (2000)
Montipora trabeculata Bernard (1897); Hoffmeister (1925); Stephenson & Wells (1955); Zou (1975)

Taxonomic Description & Diagnosis

CColonies are massive, the surface covered by irregular mounds, which are often fused into globular protuberances 12 mm wide and 15 mm high.

Calices are 0.6-0.7 mm in diameter. Corallites are immersed and separated by width of 2-4 calices. The reticulum is coarse and usually obliterated by papillae. Thecal papillae are slightly longer, but not clearly differentiated from reticulum papillae. All papillae are covered with elaborated spinules.

It is usually bright or dark green in color.

Ecology

This species usually occurs on reef slopes where it may be common, also found in shallow turbid environments.

Occurrence

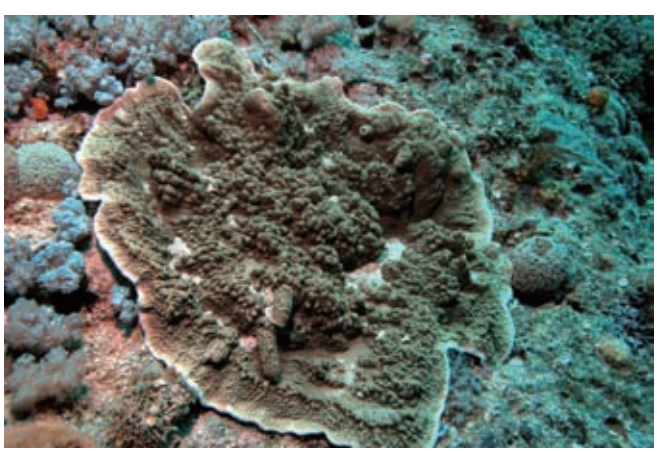
All reef areas around Taiwan and offshore islets.

Distribution

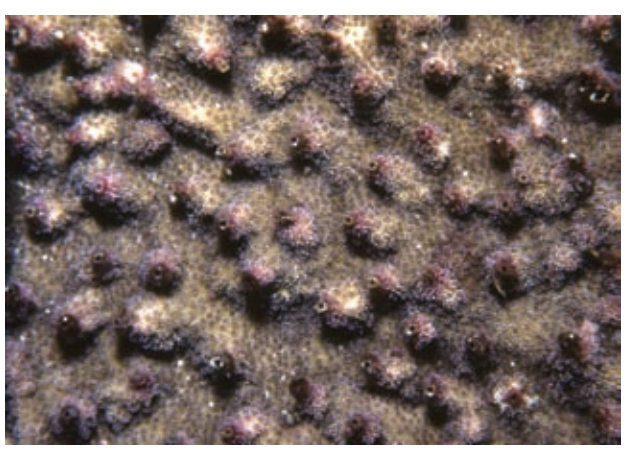
Widely distributed throughout the Indo-Pacific, east to the French Polynesia and west to the Mozambique Channel and Red Sea.

Remarks

Montipora efflorescens may be confused with *M. hispida* and *M. informis*. Massive coralla of *M. hispida* from biotopes exposed to strong wave action may have the same globular protuberances as *M. efflorescens*, both with corallites of similar size. Except the former possess strongly differentiated thecal papillae, while little or no such differentiation is found in the latter. *Montipora informis* is primarily distinguished by its smaller corallites and also in having fine compacted reticulum papillae of uniform length and no thecal papillae.



A colony of *Montipora efflorescens* (Dongsha).



A close-up view of colony surface with irregular protuberances.

Montipora foliosa (Pallas, 1766)

Chinese Name 葉形表孔珊瑚
Family Acroporidae
Publication *Madrepora foliosa* Pallas (1766)
Synonymy *Madrepora foliosa* (Pallas); Bernard (1897); Vaughan (1918); Yabe & Sugiyama (1932, 1935); Eguchi (1938); Crossland (1952); Stephenson & Wells (1955); Ma (1959); Nemenzo (1967); Pillai & Scheer (1976); Veron & Wallace (1984); Veron (1986); Nishihira & Veron (1995); Veron (2000)

A foliaceous colony of *Montipora foliosa.*

Taxonomic Description & Diagnosis

Colonies are mostly encrusting, with broad laminar margins. Large colonies may reach several meters in diameter, the horizontal laminae sometimes forming tiers or whorls. Rarely, parts of colonies may also be sub-massive or develop columns.

Calices 0.6-0.8 mm in diameter. Papillae display great variations. Those on very thin laminae may be the same dimensions as the corallites and may form ridges. These ridges are best developed towards the corallum perimeter, where a series of interconnecting radiating ridges up to 40 mm long may form. In most coralla that were not overshadowed in situ, the larger radiating ridges are much more exsert than the corallites. In submassive or columnar colonies, tuberculae are compacted and finger-like, up to 4 mm long, seldom forming ridges.

The growth form and the fine structure of coralla both vary greatly according to their position on the colony. Thus the uppermost tier of a large colony may have little resemblance to a lower tier which has been partly overgrown.

Living colonies are usually cream, pink or brown, with pale margins.

Ecology

It is common in a wide range of habitats, mostly found on protected upper reef slopes.

Occurrence

All reef sites from southern to northern Taiwan

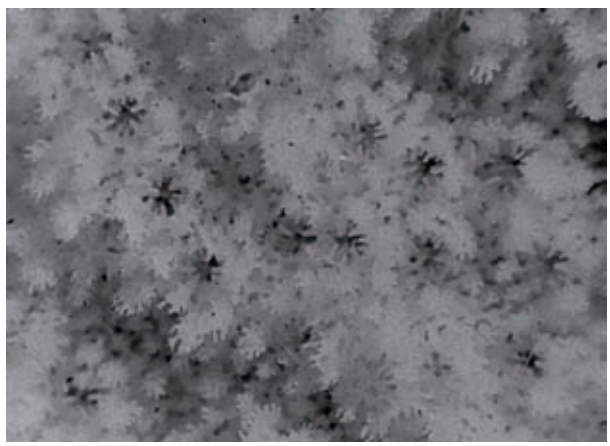
Distribution

Widely distributed in the Indo-Pacific, from East Africa and the Red Sea east to the French Polynesia.

Remarks

Montipora foliosa most closely resembles *M. aequituberculata*, but the lack of reticulum ridges in the latter.

A close view of colony surface with radiating ridges.



Corallites and coenosteum of *Montipora foliosa*. (x 4)

Montipora foveolata (Dana, 1846)

Chinese Name 窪孔表孔珊瑚
Family Acroporidae
Publication *Manopora foveolata* Dana (1846)
Synonymy *Manopora foveolata* (Dana); Bernard (1897); Crossland (1952); Wells (1954); Ma (1959); Nemenzo (1967); Veron & Wallace (1984); Veron (1986); Nishihira & Veron (1995); Veron (2000)
Montipora socialis Bernard (1897); Crossland (1952); Wells (1954)

A submmasive colony of *Montipora foveolata* (Ludao).

Taxonomic Description & Diagnosis

Coralla are massive or form thick plates. Corallites are foveolate or funnel-shaped, the latter is composed of tuberculae which are fused to form a continuous or subcontinuous rim of reticulum around the corallite. Funnel openings are 1.2-2.0 mm in diameter. Mature corallites are 0.8-1.1 mm in diameter, which open at the base of the funnel. This reticulum is covered by spinules with slightly elaborated tips.

The characteristic foveolate appearance is not clear in all coralla. Some may be highly distorted by corallites growing in different directions, or the coenosteum of the funnels may be very reduced thus the corallites are separated by less than a calice diameter.

Living colonies are usually pale brown, blue or cream but may be brightly colored, sometimes with paler funnel rims. Polyps are frequently extended during the day, which are bright blue or green.

Occurrence

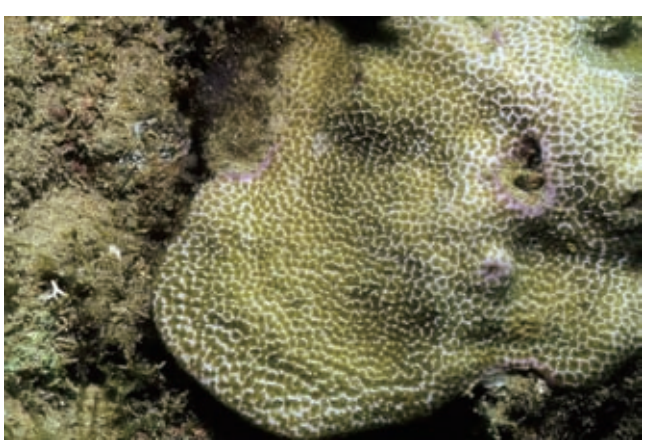
All reef areas around Taiwan and offshore islets.

Distribution

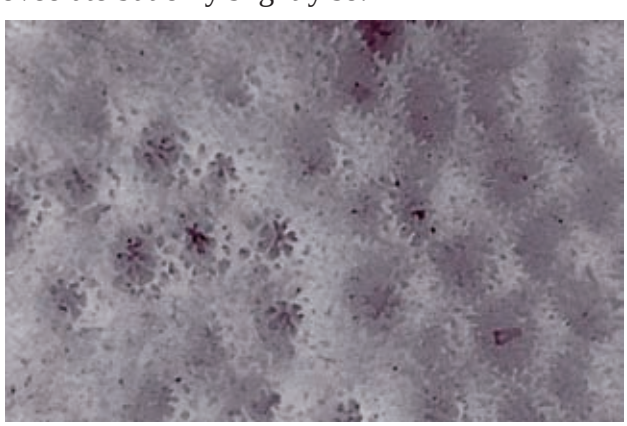
Distributed throughout western and central Pacific, from Indonesia in the west to Pitcairn Island in the east; also recorded in the Andaman Sea.

Remarks

Montipora foveolata may resemble *M. venosa* when corallite funnels are not well developed since the latter also has similar corallites which become foveolate but only slightly so.



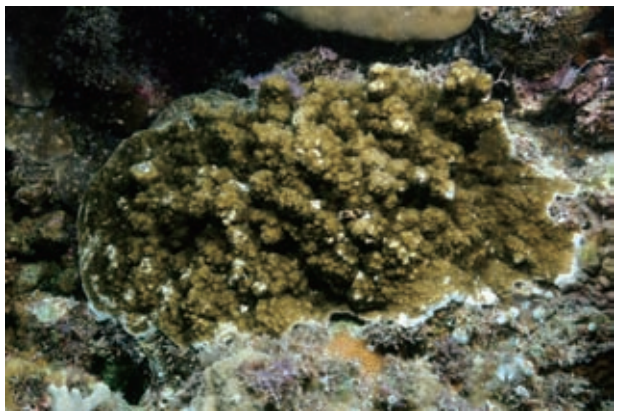
A close view of foveolate corallites.



Corallites of *Montipora foveolata.* (x 4)

Montipora grisea Bernard, 1897

Chinese Name 青灰表孔珊瑚
Family Acroporidae
Publication *Montipora grisea* Bernard (1897)
Synonymy *Montipora grisea* Bernard (1897); Veron & Wallace (1984); Veron (1986); Nishihira & Veron (1995); Veron (2000)



A submasive colony of *Montipora grisea.*

Taxonomic Description & Diagnosis

Colonies are massive, sub-massive or thick encrusting plates. Corallites are exsert, or a mixture of exsert and immersed corallites. Calices are usually 0.6-0.8mm in diameter, but may be smaller occasionally.

All corallites are surrounded by 2-7 partly fused thecal papillae which are much taller than the reticulum papillae. Thecal papillae may form fused cylinders; sometimes those of adjacent corallites are also fused. All papillae are covered with slightly elaborated spinules.

It is usually dark brown or dark green or mixtures of both, but may be various pale colors or even bright blue or pink in shallow water.

Ecology

Montipora grisea occurs in most reef communities, especially on upper reef slopes.

Occurrence

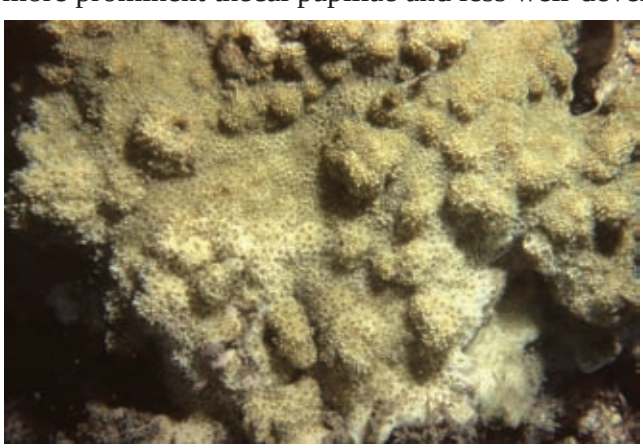
All reef areas around Taiwan.

Distribution

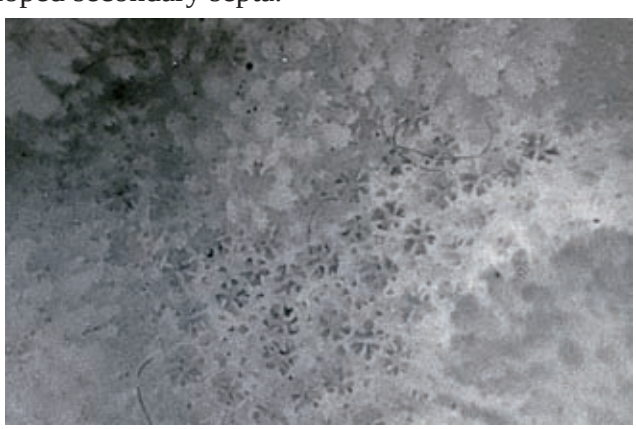
Mainly distributed in the west Pacific, from Indonesia east to Samoa. Also recorded in Pitcairn Islands and west Indian Ocean, from East Africa to the Maldives,

Remarks

Corallites of *Montipora grisea* are very similar to those of *M. hispida*, except the latter displays much more variation. However, massive and sub-massive *M. hispida* may not be separable from *M. grisea* unless both species are collected from the same biotope. In the latter case, *M. hispida* has more prominent thecal papillae and less well-developed secondary septa.



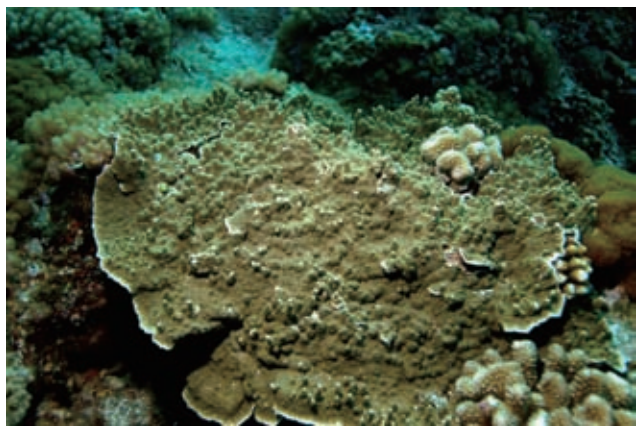
Colony surface of *Montipora grisea.*



Skeleton of *Montipora grisea.* (x 4)

Montipora hispida (Dana, 1846)

Chinese Name 鬃棘表孔珊瑚
Family Acroporidae
Publication *Montipora hispida* Dana (1846)
Synonymy *Montipora hispida* (Dana); Bernard (1897); Stephenson & Wells (1955); Ma (1959); Nemenzo (1967); Eguchi (1968); Zou (1975); Veron & Wallace (1984); Veron (1986); Nishihira & Veron (1995); Veron (2000)



A plate-like colony of *Montipora hispida*.

Taxonomic Description & Diagnosis

Coralla may be massive, sub-massive, columnar, digitate, sub-arborescent, horizontal plates, or various combinations of these forms. Growth form is partly environmentally determined. In well-illuminated biotopes exposed to wave action, colonies are massive, sub-massive or columnar; in more protected biotopes, colonies are digitate or sub-arborescent; in turbid or deep water, colonies are plate-like. However, it is common for a wide range of growth forms to occur in a single biotope, where growth form appears to be primarily determined by space availability.

Calices are 0.6-0.7 mm in diameter. Corallites are immersed to 2mm exsert in a single corallum. Each corallite is surrounded by 4-8 thecal papillae. Reticulum papillae are smaller and more widely spaced. All papillae are covered with spinules, especially at their tips. Individual spinules may also have elaborated tips.

Corallites have a very uniform appearance on upward growing surfaces. Those on flat surfaces tend to be completely immersed with short, less elaborated papillae. On plate-like coralla, papillae may be completely absent. Plates are bifacial with small, widely spaced corallites on the undersurface. Massive coralla have a heavily calcified reticulum.

Living colonies are pale brown, sometimes with white branch-tips and white tentacles.

Occurrence

All reef areas around Taiwan and offshore islets.

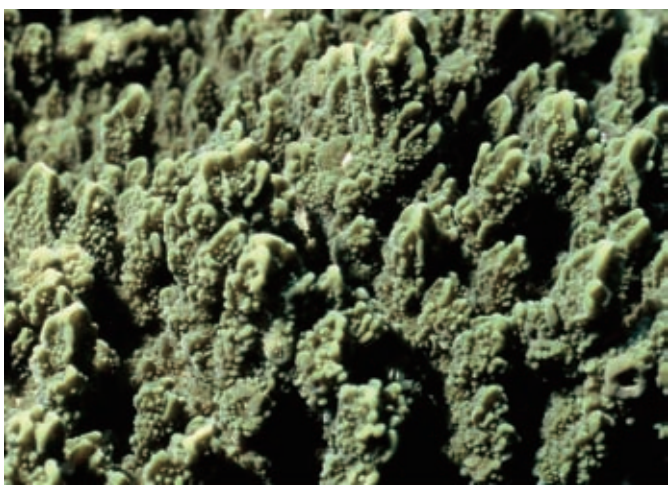
Distribution

Widely distributed in the tropical Indo-Pacific, east to Hawaii and the French Polynesia, west to the Maldives and East Africa.

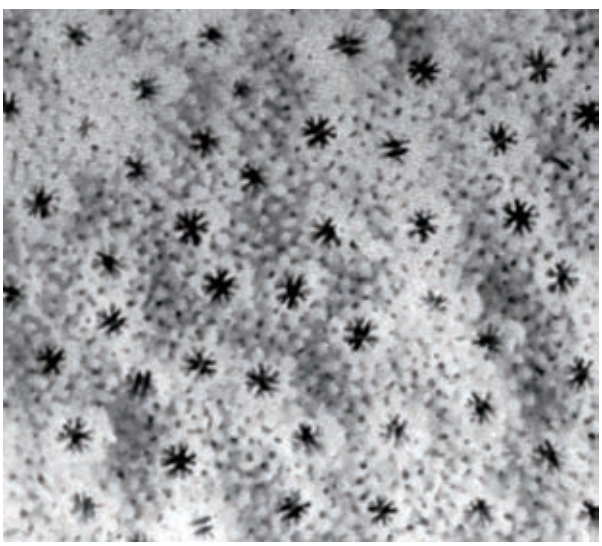
Remarks

Montipora hispida has corallites similar to those of *M. efflorescens* and *M. grisea*, but is readily distinguished from these species by its growth forms. In superficial appearance it is closest to *M. efflorescens* with papillae of almost uniform size, whereas *M. hispida* has thecal papillae clearly larger than reticulum papillae.

Coralla of *M. hispida*, which have immersed corallites and reduced thecal papillae, may be confused with several other species, notably *M. peltiformis.*



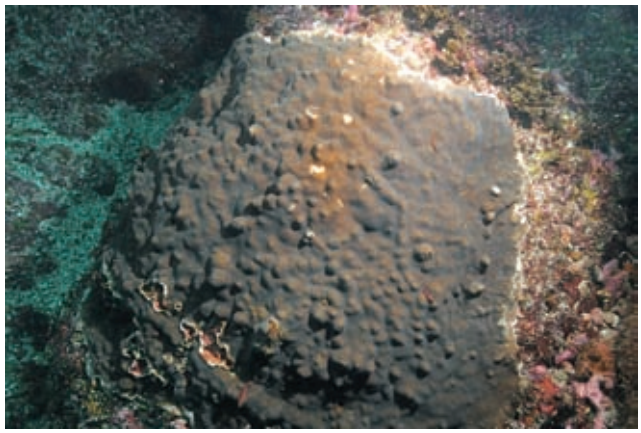
Columnar protuberances on colony surface.



Corallites and coenosteum of *Montipora hispida.* (x 4)

Montipora informis Bernard, 1897

Chinese Name 變形表孔珊瑚
Family Acroporidae
Publication *Montipora informis* Bernard (1897)
Synonymy *Montipora informis* Bernard (1897); Vaughan (1918); Umbgrove (1940); Crossland (1952); Stephenson & Wells (1955); Ma (1959); Scheer & Pillai (1974); Veron (1982). Veron & Wallace (1984); Veron (1986); Nishihira & Veron (1995); Veron (2000)


An encrusting colony of *Montipora informis.*

Taxonomic Description & Diagnosis

Colonies are massive, plate-like or encrusting.

Corallites are uniformly distributed, calices are 0.4-0.6 mm in diameter. Coralla from protected turbid environments have the largest corallites, those from environments exposed to strong wave action have smaller corallites. The reticulum is uniformly covered with elongated papillae, with elaborated ends, of uniform size. No conspicuous thecal papillae are developed. The thickness and length of papillae varies greatly among different coralla; the thickest papillae usually occur on columnar colonies which have the largest calices and are covered with elaborated spinules.

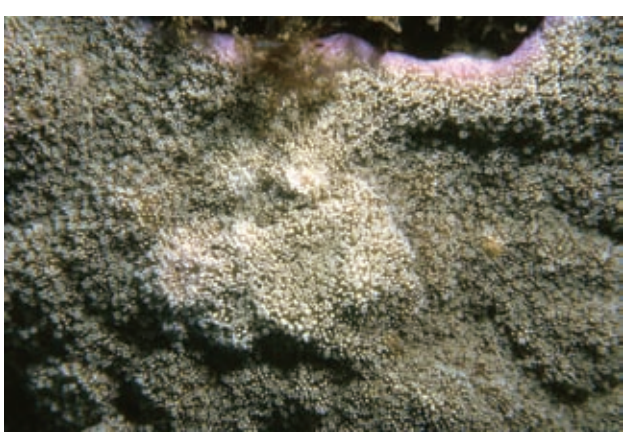
Living colonies are usually brown or mottled brown and white. Papillae often have white or blue tips. White polyps may be extended during the day.

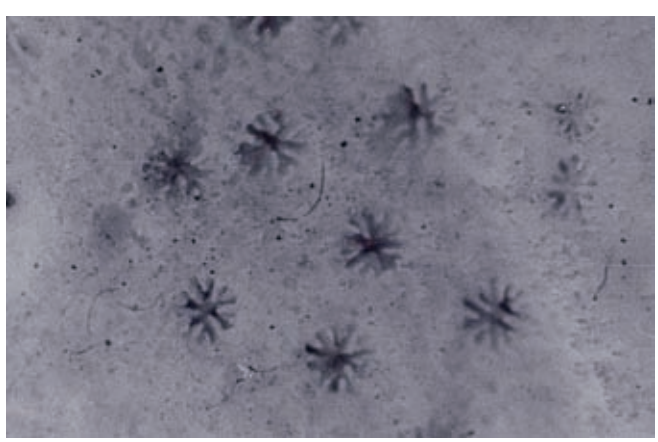
Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

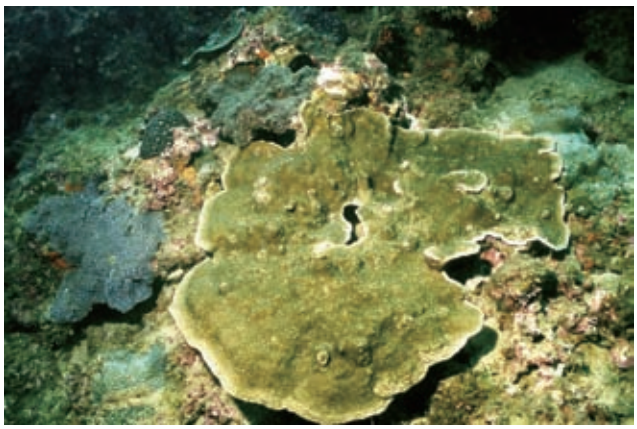
Widely distributed throughout the Indo-Pacific from East Africa and the Red Sea in the west, to French Polynesia in the east.


A close view of colony surface.


Corallites and coenosteum of *Montipora informis.* (x 7)

Montipora millepora Crossland, 1952

Chinese Name 多孔表孔珊瑚
Family Acroporidae
Publication *Montipora millepora* Crossland (1952)
Synonymy *Montipora millepora* Crossland (1952); Veron & Wallace (1984); Veron (1986); Nishihira & Veron (1995); Veron (2000) Nishihira & Veron (1995); Veron (2000)



An encrusting colony of *Montipora millepora.*

Taxonomic Description & Diagnosis

Colonies are massive or encrusting; massive colonies are usually with flattened encrusting margins.

Corallites are immersed, occasionally with a well-defined thecal rim. Calices are 0.4-0.6 mm in diameter. Corallites are evenly distributed between and on the sides of low encrusting tuberculae, which covered the coralla. On the corallum perimeter corallites become very small.

It is usually dark green or dark red.

Ecology

Montipora millepora usually occurs in crevices and beneath overhangs. It is common but inconspicuous.

Occurrence

All reef areas around Taiwan and offshore islets.

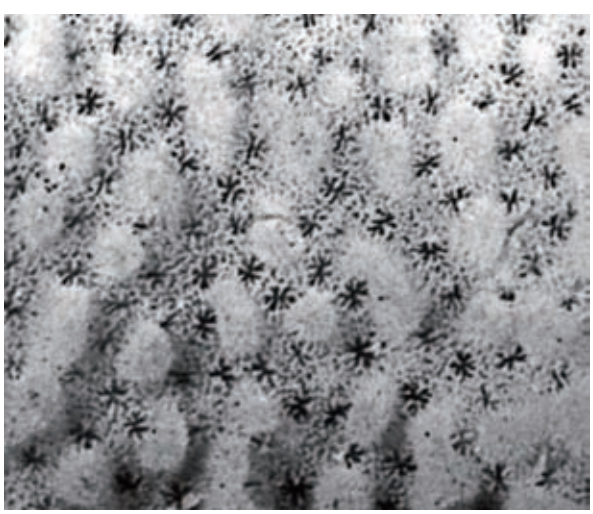
Distribution

Widely distributed throughout the Indo-Pacific, from the Red Sea and East Africa in the west to Fiji in the east.

Remarks

Montipora millepora closely resembles *Stylocoeniella* in situ.

A close view of polyps.



Corallites and tuberculae of *Montipora millepora.* (x 5)

Montipora mollis Bernard, 1897

Chinese Name 柔和表孔珊瑚
Family Acroporidae
Publication *Montipora mollis* Bernard (1897)
Synonymy *Montipora mollis* Bernard (1897); Veron & Wallace (1984); Veron (1986); Nishihira & Veron (1995); Veron (2000)

Plate-like colonies of *Montipora mollis.*

Taxonomic Description & Diagnosis

Colonies are encrusting, bifacial plates, columnar, or short, fused, irregular clumps. Individual columns are <50 mm long and <4.5 mm thick.

Corallites have calices 0.5-0.7 mm in diameter and well-developed thecae. Corallites varies with colony shape, which may be immersed, cucullate, or uniformly surrounded by a tubercular tube. Columnar colonies have some corallites with *Acropora*-like lower lips. Plate-like coralla may have low conical reticulum tuberculae. All coralla have a spongy reticulum which becomes slightly finer on tuberculae and covered with simple spinules.

It usually has a uniform brown color.

Ecology

Montipora mollis occurs primarily on subtidal flats and other inshore habitats.

Occurrence

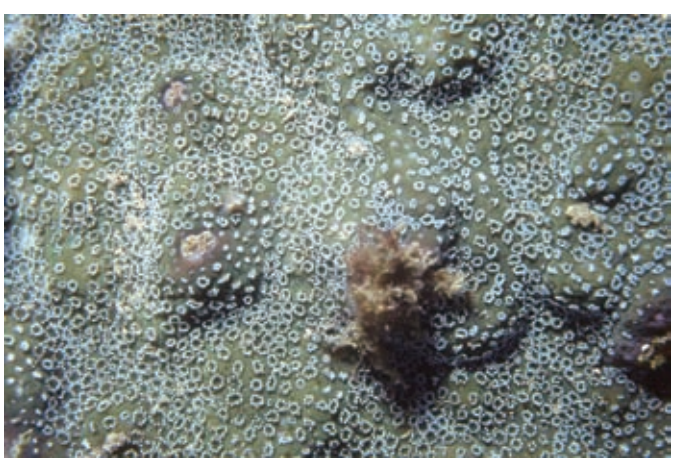
All reef areas around Taiwan and offshore islets.

Distribution

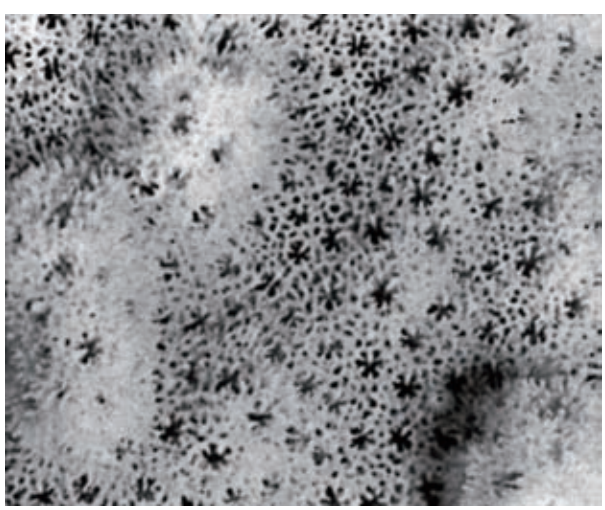
Widely distributed throughout the Indo-Pacific, from the Red Sea to Hawaii.

Remarks

Montipora mollis may resemble *M. turgescens.*



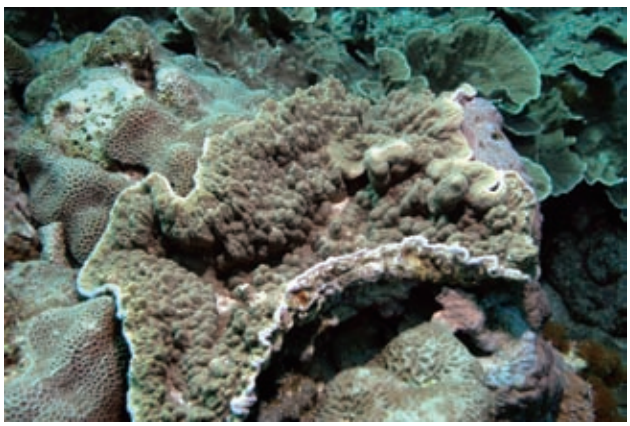
A close view of colony surface with extending polyps.



Corallites and coenosteum of *Montipora mollis.* (x 5)

Montipora peltiformis Bernard, 1897

Chinese Name 翼形表孔珊瑚
Family Acroporidae
Publication *Montipora peltiformis* Bernard (1897)
Synonymy *Montipora peltiformis* Bernard (1897); Nemenzo (1967); Veron & Wallace (1984); Veron (1986); Nishihira & Veron (1995); Veron (2000)



A plate-like colony of *Montipora peltiformis.*

Taxonomic Description & Diagnosis

Colonies are sub-massive or flat plates. Nodular upward growths of irregular size and shape may develop, but do not develop into columns.

Corallites are mostly immersed and crowded with those on concave surfaces between nodules being the most crowded. Calices are approximately 0.6 mm in diameter. Small, widely spaced corallites may be on the undersurface of bifacial plates. Thecal and reticulum papillae are usually slightly different, especially on nodules where the former form a distinct circle around the corallites. Papillae are covered by very elaborated spinules and are usually not fused but sometimes form short ridges. Papillae are usually absent from concave surfaces. The reticulum is coarse and covered with slightly elaborated spinules.

The color is usually brown.

Ecology

This species is usually found on shallow reef slopes.

Occurrence

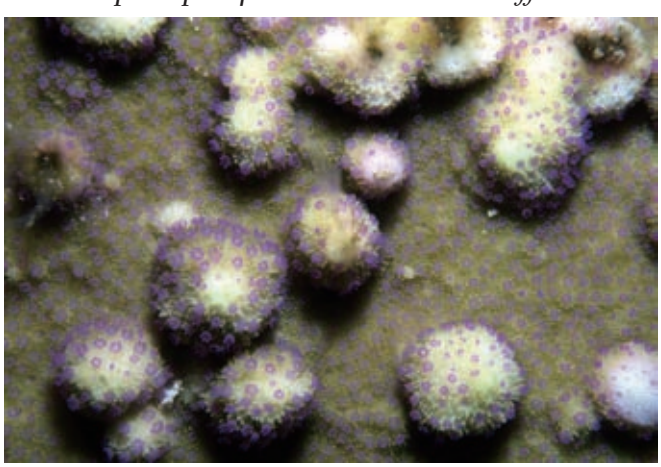
Southern Taiwan, Ludao, Dongsha Atoll.

Distribution

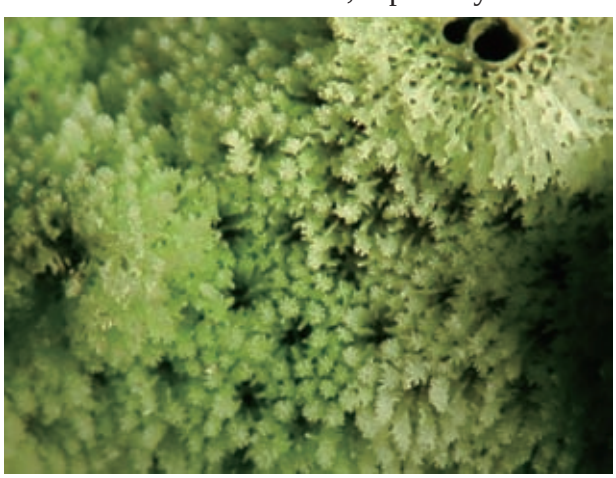
Widely distributed throughout the Indo-Pacific, from the Red Sea to Hawaii.

Remarks

Montipora peltiformis resembles *M. efflorescens.* It also resembles *M. mollis,* especially in situ.



Nodular structures on colony surface.



Corallites and thecal papillae. (x 5)

Montipora spongodes Bernard, 1897

Chinese Name 海綿表孔珊瑚
Family Acroporidae
Publication *Montipora spongodes* Bernard (1897)
Synonymy *Montipora spongodes* Bernard (1897); Veron and Wallace (1984); Veron (1986); Nishihira & Veron (1995); Veron (2000)

An encrusting colony of *Montipora spongodes.*

Taxonomic Description & Diagnosis

Colonies have irregular encrusting or plate-like bases which may have rootlets. Plates have upward projecting ridges or irregular mounds, which may develop into irregularly anastomosing columns.

Corallites are immersed, evenly distributed, and widely spaced by 2-4 calices. Calices are 0.7-0.8 mm in diameter. The reticulum is very uniform, smooth, and completely glabrous. Reticulum spinules have no elaborations.

Colors of living colonies range from uniform pale cream to deep grey.

Occurrence

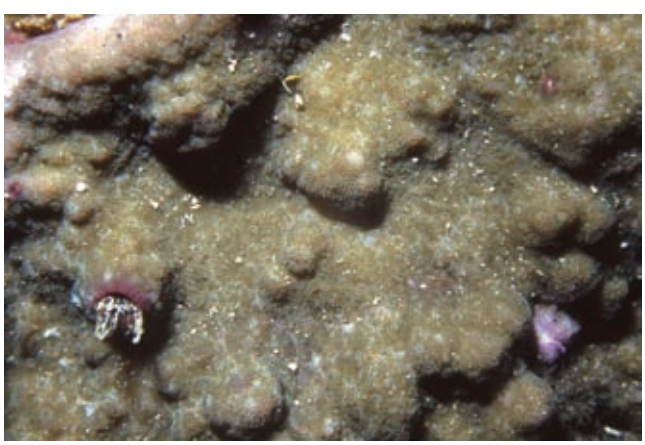
All reef areas around Taiwan and offshore islets.

Distribution

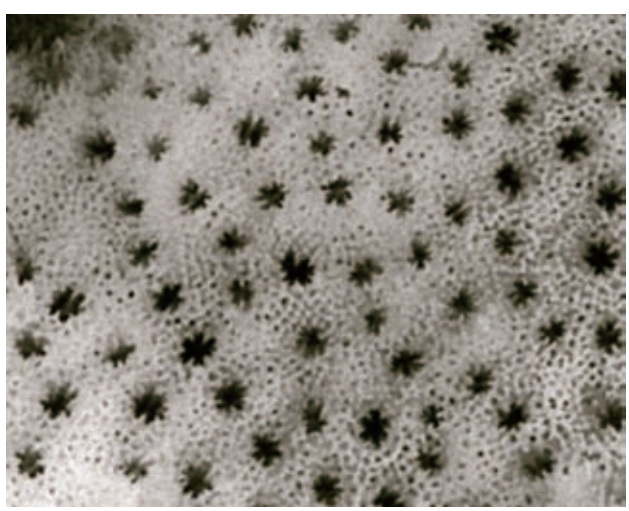
Widely distributed from the western Indian Ocean east to Fiji and Tuvalu.

Remarks

Montipora spongodes can be distinguished from other glabrous species by its growth form and widely spaced corallites. It is most similar to *M. turgescens* which has more compacted corallites with thecal rims and elaborated reticulum spinules.



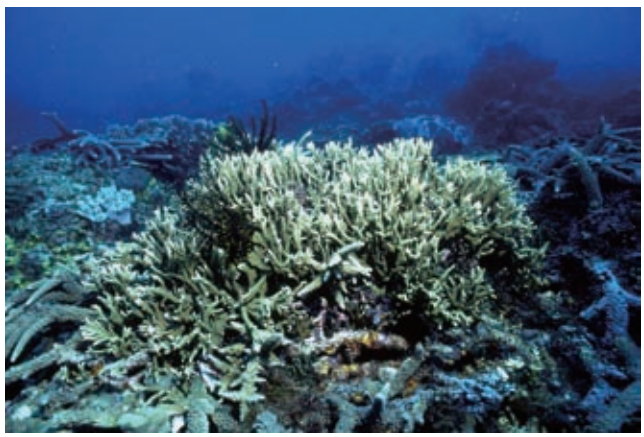
A close view of colony surface showing irregular mounds.



Immersed corallites and uniform reticulum. (x 4)

Montipora stellata Bernard, 1897

Chinese Name 星枝表孔珊瑚
Family Acroporidae
Publication *Montipora stellata* Bernard (1897)
Synonymy *Montipora stellata* Bernard (1897); Veron and Wallace (1984); Veron (1986); Nishihira & Veron (1995); Veron (2000)
Montipora viridis Bernard (1897)
Montipora angularis Crossland (1952)
Montipora strigosa Nemenzo (1967)
Montipora hirsuta Nemenzo (1967)


A branching colony of *Montipora stellata.*

Taxonomic Description & Diagnosis

Colonies are usually small, laminar or branching, < 30cm in height. The former consists of contorted laminae, sometime in tiers or whorls. The latter is sub-arborescent with upright contorted branches which are irregularly anastomosed. These two forms frequently occur together in a single colony giving *M. stellata* highly various appearances.

Corallites are immersed. Calices are of a uniform size, 0.7-0.8 mm in diameter, whereas they may be much smaller in colonies with fine contorted branches. Thecal papillae are numerous and closely compacted, which may develop into short, irregular ridges. Most corallites are surrounded by several thecal papillae slightly larger than the reticulum papillae. The structure of the reticulum varies greatly according to position on the corallum. Reticulum at the base of branches is coarse and spongy, with irregular and small reticulum papillae. Elsewhere, the reticulum is fine and spongy, has a frosted appearance with elaborated spinules.

Living colonies are usually cream, blue or brown with white ridges.

Ecology

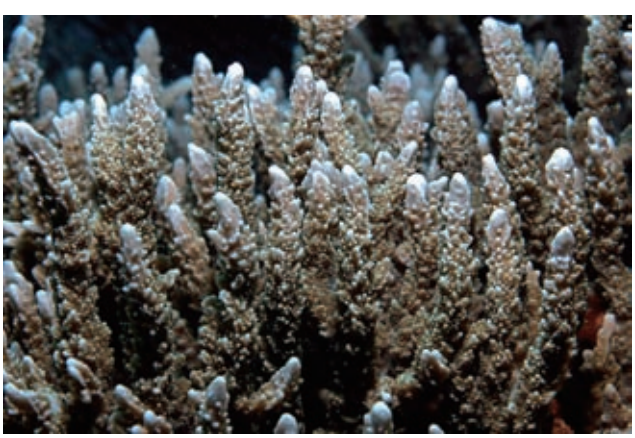
Montipora stellata is most common in protected turbid water.

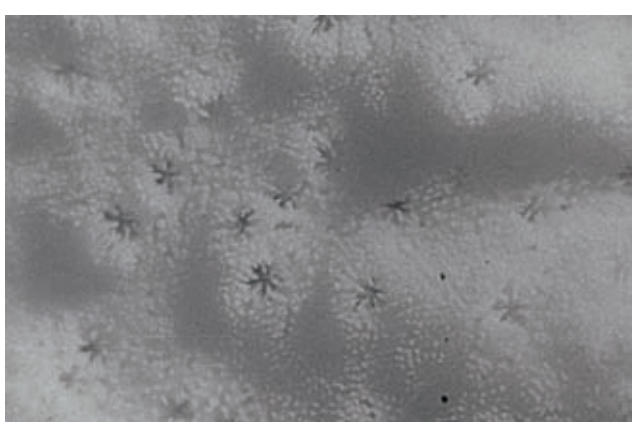
Occurrence

All reef areas around Taiwan, except northern Taiwan.

Distribution

Distributed in the western Pacific, east from Indonesia to the Solomon Islands in the west, Okinawa in the north, Australia in the south; also recorded in the Red Sea.


A close view of branches.


Corallites and thecal papillae. (x 5)

Montipora taiwanensis Veron, 2000

Chinese Name 台灣表孔珊瑚
Family Acroporidae
Publication *Montipora taiwanensis* Veron (2000)

Taxonomic Description & Diagnosis

Colonies are submassive to encrusting, robust and conspicuous, up to 0.5 m in diameter. The surface is covered with contorted, irregular, large verrucae. These verrucae are not fused into any pattern.

Corallites are large and are slightly foveolate. The average diameter is about 1 mm at the upper margin of the foveolae and slightly less at the level of the theca. Thecae are inconspicuous. Septa are generally arranged in two orders, with first order 0.5-0.7 R in length and the second order much shorter or absent. The coenosteum is uniform and moderately coarse.

Living colonies are usually pale brown or purple.

Ecology

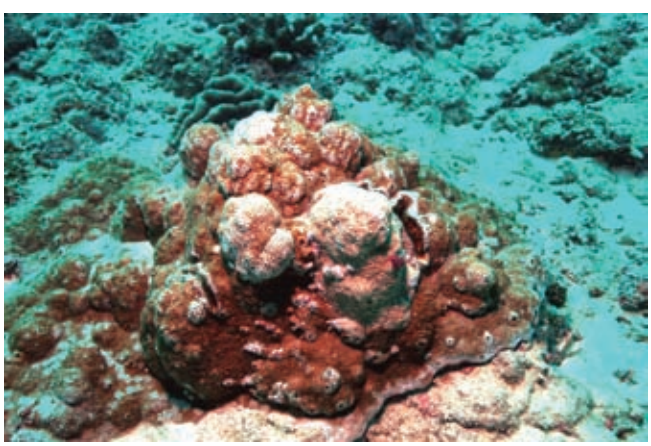
Montipora taiwanensis is an endemic species of Taiwan. It is rare, usually occurs in shallow water exposed to wave action.

Occurrence

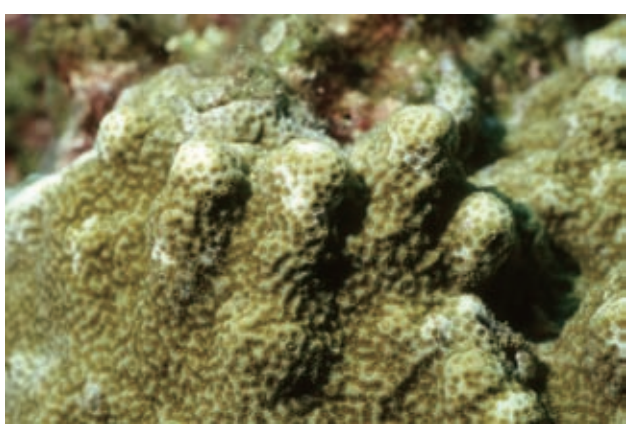
Nanwan Bay, Hengchun; Penghu Islands

Distribution

It has only been recorded in Taiwan and the Philippines.



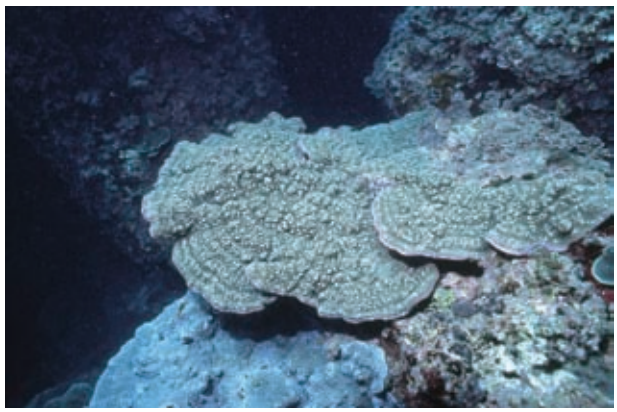
A submassive colony of *Montipora taiwanensis* (Nanwan).



A close view of colony surface.

Montipora tuberculosa (Lamarck, 1816)

Chinese Name 結節表孔珊瑚
Family Acroporidae
Publication *Porites tuberculosa* Lamarck (1816)
Synonymy *Montipora tuberculosa* (Lamarck); Bernard (1897); Hoffmeister (1925); Wells (1954); Veron & Wallace (1984); Veron (1986); Nishihira & Veron (1995); Veron (2000)



A plate-like colony of *Montipora tuberculosa* (Ludao).

Taxonomic Description & Diagnosis

Colonies are submassive, encrusting or plate-like, sometimes with irregular mounds on its surface.

Corallites are small, immersed or exsert, and evenly distributed. Calices are 0.4-0.7 mm in diameter. Corallites may be completely surrounded by thecal papillae, or only partly surrounded by papillae which are conical or fused into incomplete circles. The reticulum is always spongy and coarse. Reticulum papillae are relatively uncommon. All papillae are covered by highly elaborated projecting spinules.

Colonies from environments exposed to strong wave action have regular septa composed of thick spines which may be granulated; all septa are of irregular lengths in colonies from deep water.

It is usually dull brown or green but may be brightly colored in shallow water.

Ecology

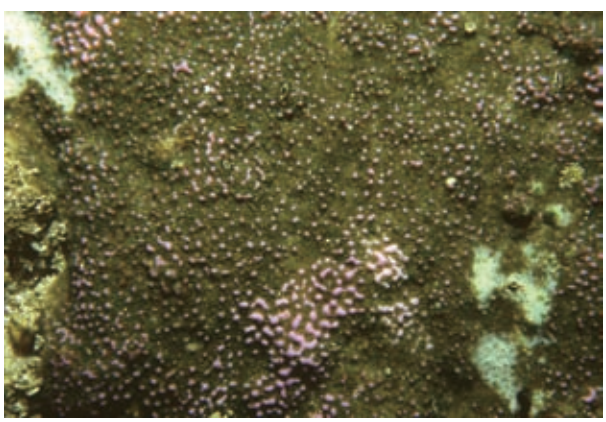
Montipora tuberculosa occurs over a wide environmental range.

Occurrence

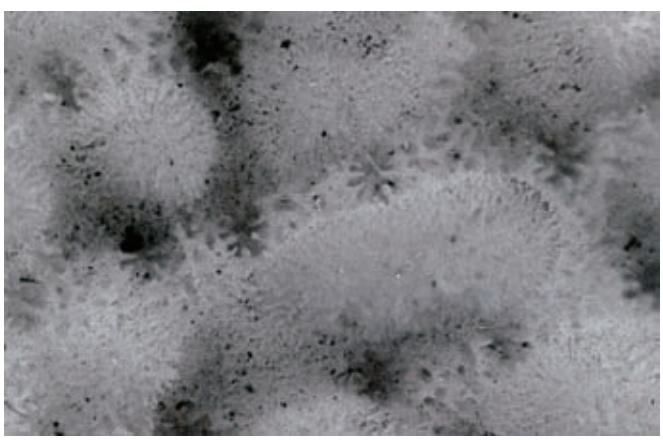
Reefs sites from southern to northern Taiwan.

Distribution

Widespread in the tropical Indo-Pacific, although most records are obscured by taxonomic problems.



A close view of colony surface showing polyps and thecal papillae.



Skeleton of *Montipora tuberculosa.* (x 10)

Montipora turgescens Bernard, 1897

Chinese Name 膨脹表孔珊瑚
Family Acroporidae
Publication *Montipora turgescens* Bernard (1897)
Synonymy *Montipora turgescens* Bernard (1897); Scheer & Pillai (1974); Zou (1975); Veron and Wallace (1984); Veron (1986); Nishihira & Veron (1995); Veron (2000)

A flattened colony of *Montipora turgescens* (Ludao).

Taxonomic Description & Diagnosis

Colonies are massive, flattened, hemispherical, plate-like or columnar. The surface may be raised into convex subcircular mounds of 3-12 mm in diameter.

Corallites are immersed and uniformly distributed on and between these mounds. Calices are 0.7-0.9 mm in diameter. Immature corallites appear as clusters of thin irregular septal spines, similar to reticulum spinules, but without elaborations, which are budded in undifferentiated reticulum. The reticulum is uniform in structure, spongy, covered with highly elaborated spinules.

Development of the surface mounds vary greatly, even in a single corallum. These may be small or absent on flat or concave surfaces, and vary greatly in size on convex surfaces. In some coralla, they may be small enough to form the walls of single corallites which consequently appear to be exsert.

Living colonies are uniform in color, usually brown, cream or purple.

Occurrence

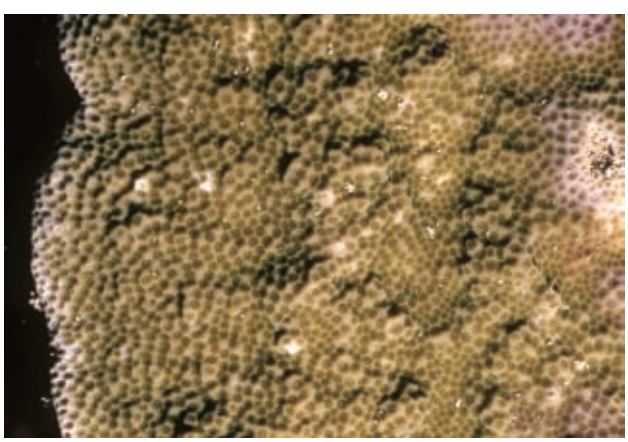
All reef areas around Taiwan and offshore islets.

Distribution

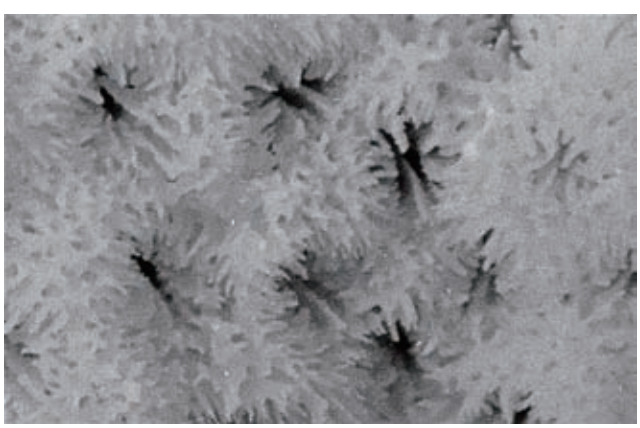
Widely distributed throughout the Indo-Pacific, from the Red Sea and East Africa to Hawaii and French Polynesia.

Remarks

Coralla from shallow protected biotopes may resemble *M. mollis* and *M. spongodes*. The former is distinguished by its differing growth form and smaller corallites.



A close view of colony surface showing immersed corallites.



Corallites and reticulum spinules. (x 12)

Montipora undata Bernard, 1897

Chinese Name 波形表孔珊瑚
Family Acroporidae
Publication *Montipora peltiformis* Bernard (1897)
Synonymy *Montipora undata* Bernard (1897); Ma (1959); Veron and Wallace (1984); Veron (1986); Nishihira & Veron (1995); Veron (2000)
Montipora denticulata Bernard (1897); Ma (1959)

A large colony of *Montipora undata*.

Taxonomic Description & Diagnosis

Colonies are plate-like or columnar. Plates may be horizontal or vertical, which may be contorted into whorls or tubes. Columns are thick which may be flattened or branching. The whole surface is covered with tuberculae which are usually fused into ridges. These ridges are usually parallel and perpendicular to the corallum margins on flat surfaces. On columns the ridges slope in groups to form a pattern similar to that of Porites rus (Forskål).

Corallites are immersed, and are restricted between the ridges. Calices are 0.4-0.6 mm in diameter. The reticulum is medium-fine, that of the ridges and valleys being similar.

Living colonies are usually uniform purple, pink or brown and frequently have pale growing margins.

Ecology

This species is usually found on shallow reef slopes.

Occurrence

Southern Taiwan, Ludao, Lanyu, Dongsha Atoll.

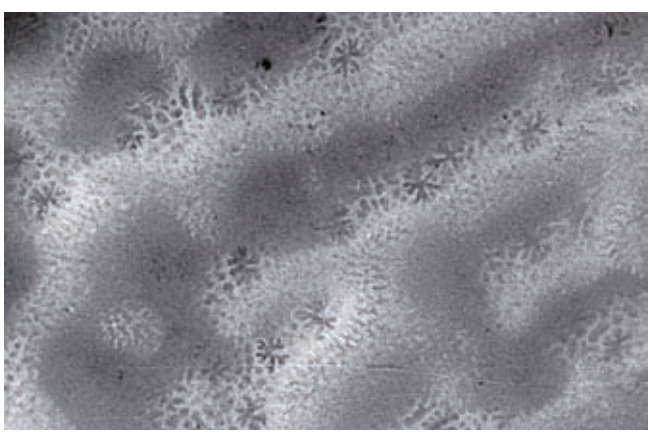
Distribution

Widely distributed throughout the Indo-Pacific, east from Sri Lanka to Fiji and Tuvalu in the west, also recorded in Maldives, Mauritius, and Madagascar.

Remarks

Montipora undata resembles *M. danae*. It is distinguished by having thin coenostial ridges and smaller corallites with less well-developed septa.

A close view of colony surface showing corallites and ridges.



Skeleton of *Montipora undata*. (x 10)

Montipora venosa (Ehrenberg, 1834)

Chinese Name 脈結表孔珊瑚
Family Acroporidae
Publication *Porites venosa* Ehrenberg (1834)
Synonymy *Montipora venosa* (Ehrenberg); Vaughan (1918); Umbgrove (1940); Crossland (1952); Wells (1954); Stephenson & Wells (1955); Veron and Wallace (1984); Veron (1986); Nishihira & Veron (1995); Veron (2000)

A submassive colony of *Montipora venosa*.

Taxonomic Description & Diagnosis

Colonies are massive or sub-massive. Corallites are a mixture of forms, may be slightly exsert, immersed or funnel-shaped. Calices are 0.8-1.0 mm in diameter. Corallites may be with or without common reticulum walls which is similar to that of *M. foveolata*, although it is slightly coarser and forms a funnel only slightly wider than the calice diameter. High variation is seen in the degree of development of the corallite funnels; development is uniform in some colonies, while in others, it varies greatly between adjacent corallites.

Living colonies are usually pale brown or blue.

Occurrence

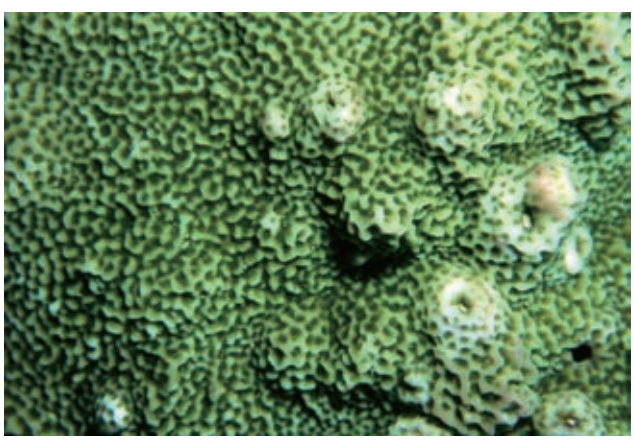
All reef areas around Taiwan and offshore islets.

Distribution

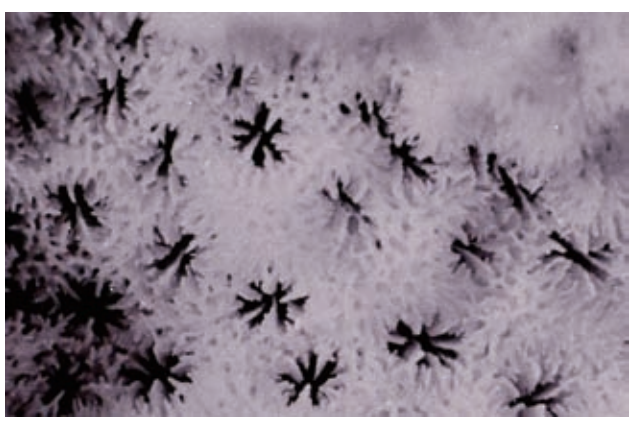
Widely distributed in the tropical Indo-Pacific, from the Red Sea and Mozambique Channel to the Marshall Islands and French Polynesia.

Remarks

Montipora venosa is like a diminutive *M. foveolata*



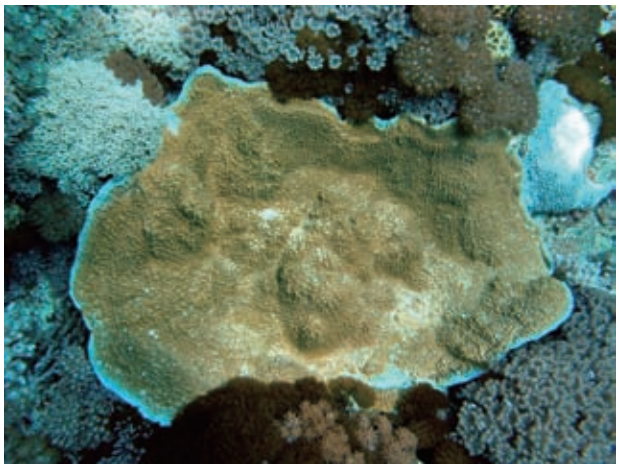
A close view of colony surface showing funnel-shaped corallites.



Corallites and reticulum structures. (x 10)

Montipora verrucosa (Lamarck, 1816)

Chinese Name 疣突表孔珊瑚
Family Acroporidae
Publication *Porites verrucosa* Lamarck (1816)
Synonymy *Montipora verrucosa* (Lamarck); Yabe & Sugiyama (1935); Eguchi (1938); Crossland (1952); Boschma (1954); Wells (1954); Ma (1959); Nemenzo (1967); Chevalier (1968); Veron and Wallace (1984); Veron (1986); Nishihira & Veron (1995); Veron (2000)
Montipora papillosa (Lamarck); Bernard (1897); Ma (1959)



A plate-like colony of *Montipora verrucosa* (Ludao).

Taxonomic Description & Diagnosis

Colonies are sub-massive or plate-like, the surfaces are covered with verrucae of uniform size and shape, which are usually 2.0-3.5 mm in diameter.

Corallites are immersed and are uniformly interspersed in the flat reticulum between, never on, the verrucae. Calices are 0.9-1.3mm in diameter. The small verrucae along the periphery of plate-like colonies usually are joined to form short ridges perpendicular to the margin. The reticulum is spongy, except that of the verrucae which is relatively fine and covered with elaborated spinules.

Living colonies are usually blue or brown, either uniformly colored or mottled. Bright blue or green polyps are frequently extended during the day.

Occurrence

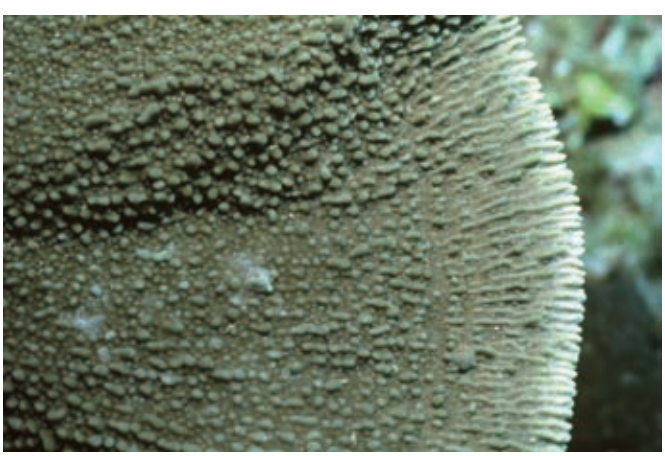
All reef areas around Taiwan, except northern Taiwan.

Distribution

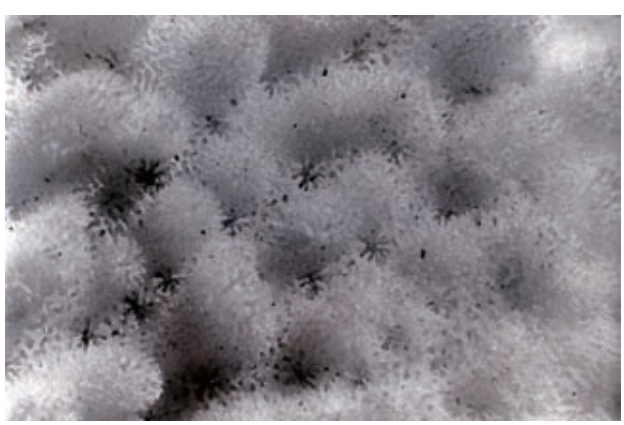
Widely distributed in the tropical Indo-Pacific, from the Red Sea and Mozambique Channel east to the French Polynesia.

Remarks

Montipora verrucosa closely resembles *M. danae*.



A close view of colony surface showing verrucae and corallites.



Skeleton of *Montipora verrucosa.* (x 5)

Montipora angulata (Lamarck, 1816)

Chinese Name 角枝表孔珊瑚
Family Acroporidae
Publication *Porites angulata* Lamarck (1816)
Synonymy *Montipora angulata* Veron & Wallace (1984); Veron (1986); Nishihira & Veron (1995); Veron (2000)
Montipora ramosa Nemenzo (1967)
Montipora cocosensis Vaughan (1918); Scheer & Pillai (1974)
Montipora fossae Crossland (1952)

Taxonomic Description & Diagnosis

Colonies are encrusting, with short, contorted, clump-like branches. Corallites are immersed and evenly distributed, but may appear foveolate when the reticulum forms fine ridges between corallites. Calices are 0.7-1.0 mm in diameter. Septa are arranged in two complete cycles, with non-tapering septal spines arranged in rows. Primary septa are 2/3-3/4R, may form a columella plug deep within the corallite. Secondary septa are 1/4-1/2R. The reticulum is usually coarse and not spinulated.

Living colonies are pale brown.

Ecology

Usually found on fringing reef flats, but is rare.

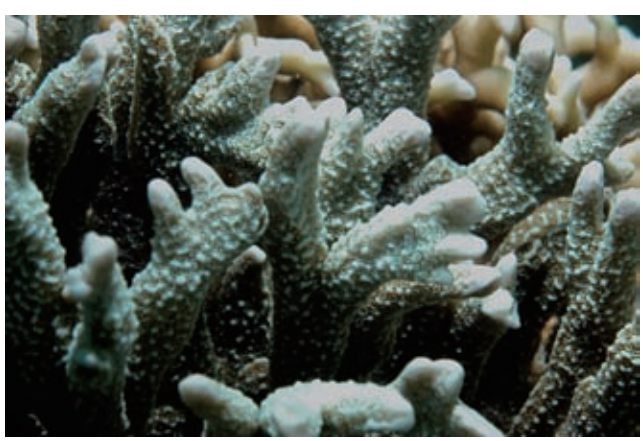
Occurrence

Nanwan Bay, Penghu Islands, and Ludao.

Distribution

Widely distributed throughout the Indo-Pacific, from Sri Lanka to French Polynesia.

Branches of *Montipora angulata* (Dongsha).



A close view of branches.

Montipora digitata (Dana, 1846)

Chinese Name 指形表孔珊瑚
Family Acroporidae
Publication *Manopora digitata* Dana (1846)
Synonymy *Montipora digitata* Crossland (1952); Scheer & Pillai (1974); Veron & Wallace (1984); Veron (1986); Nishihira & Veron (1995); Veron (2000)
Montipora tortuosa Vaughan (1918); Eguchi (1938)
Montipora rubra Nemenzo (1967)
Montipora levis Vaughan (1918)
Montipora irregularis Nemenzo (1967)
Montipora fruticosa Crossland (1952); Nemenzo (1967); Zou (1975)
Montipora marenzelleri Nemenzo (1967)
Montipora alcicornis Nemenzo (1967)
Montipora ramosa Vaughan (1918); Eguchi (1938); Crossland (1952); Ma (1959)

Taxonomic Description & Diagnosis

Colonies are digitate to arborescent, with branches irregularly anastomosing. Branches become thinner, anastomosing, terete or tapering from colonies in protected subtidal biotopes. Corallites are immersed, relatively small, shallow, and compacted on colonies from intertidal biotopes, and becoming progressively larger, more excavated and wider spaced on those from deeper waters. Living colonies are pale cream to brown. Corallites are fine, with calices of 0.3-0.5 mm in diameter. Primary septa are complete, <1/2R, and consist of only irregular spines.

Ecology

Occurs in most reef environments.

Occurrence

Southern Taiwan, Xiaoliuchiu, Ludao, and Penghu Islands.

Distribution

Widely distributed throughout the Indo-Pacific, from and east Africa, to Marshall Islands and Fiji.

A digitate colony of *Montipora digitata*.

A close view of branches.

Montipora hoffmeisteri Wells, 1954

Chinese Name 賀氏表孔珊瑚
Family Acroporidae
Publication *Montipora hoffmeisteri* Wells (1954)
Synonymy *Montipora hoffmeisteri* Veron & Wallace (1984); Veron (1986); Nishihira & Veron (1995); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are thick, submassive plates. Conical tuberculae of 2-4 mm in diameter, are distributed throughout the colony surface, and they may be irregularly fused. Corallites are immersed, mainly concentrated between the tuberculae, but may also be situated on the top or sides of the tuberculae. Calices are 0.7-0.9 mm in diameter. Septa are arranged in two cycles. Primary septa are complete, up to 2/3R, with non-tapered septal spines arranged in rows. Secondary septa are incomplete to absent, up to 1/3R, with rows of smaller spines. Reticulum is moderately coarse, spongy, and spinulate.

Living colonies are cream or brown, sometimes may be brightly colored.

Ecology

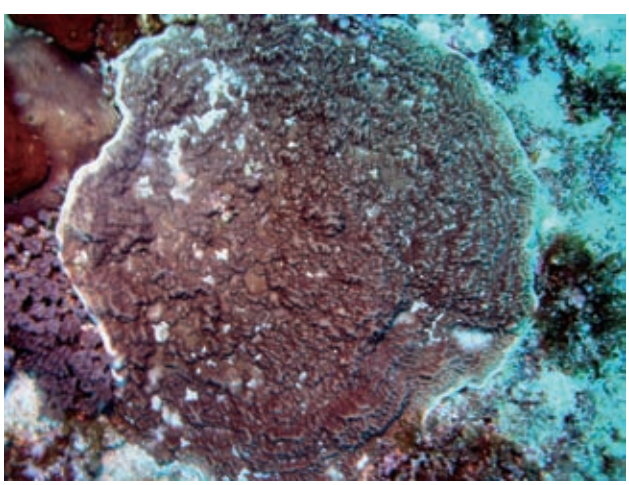
Found in most reef environment, common but inconspicuous.

Occurrence

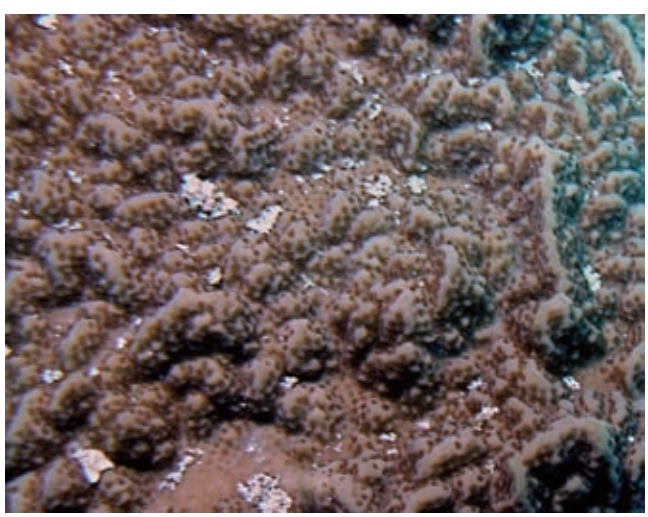
Southern Taiwan and Donghsa Atoll.

Distribution

Widely distributed throughout the west Pacific, from the Indonesian Archipelago to Okinawa.



A thick encrusting colony of *Montipora hoffmeisteri* (Dongsha).



A close view of colony surface.

Montipora incrassata (Dana, 1846)

Chinese Name 厚板表孔珊瑚
Family Acroporidae
Publication *Manopora incrassata* Dana (1846)
Synonymy *Montipora incrassata* Veron & Wallace (1984); Veron (1986); Nishihira & Veron (1995); Veron (2000)
Montipora prominula Crossland (1952)

Taxonomic Description & Diagnosis

Colonies are thick laminar plates, with or without contorted nodular columns which are covered with irregularly fused ridges or nodules. Corallites are a mixture of forms, being immersed or exsert, the latter usually on the sides or tops of tuberculae, which may be tubular. They are irregularly distributed, with calices of approximately 1 mm in diameter, but smaller (0.7-0.8 mm) for those on column tops. Septa are in two complete cycles, with rows of septal spines usually fused into a dentate plate deep within the corallite. Primary septa are up to 3/4R or may fuse deep in the corallite to form a columella plug. Secondary septa are sub-equal to 1/3R. Reticulum is spongy and covered with slightly elaborated spinules. Tuberculae may be fused into ridges perpendicular to the colony periphery.

Living colonies are usually brown or purple, may be uniformly colored or mottled. Polyps are usually white.

Ecology

Occurs mostly on upper reef slopes, but is uncommon.

Occurrence

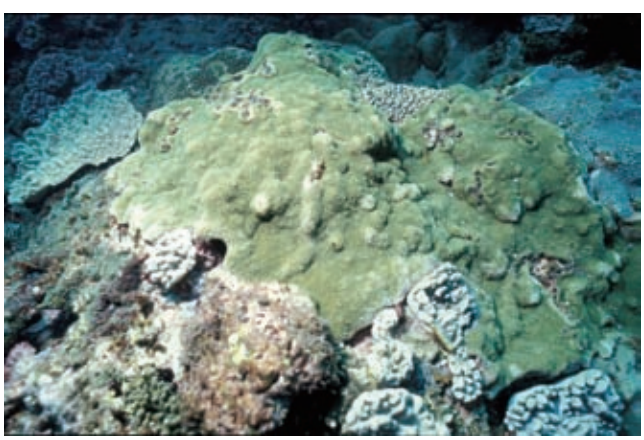
Southern Taiwan, Ludao.

Distribution

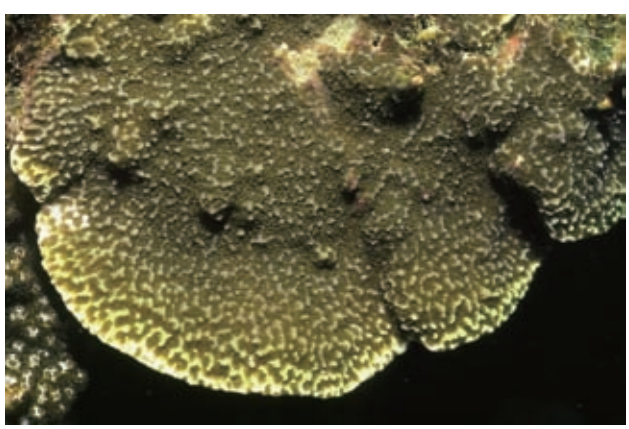
Widely distributed throughout west Pacific, from the Indonesian Archipelago to Okinawan, eastward to Fiji and Hawaii.

Remarks

This species is similar to *M. monasteriata*, but the latter does not have tubular tuberculae. It may also resemble *M. foveolata*, but it is distinguished from the latter by having smaller, not foveolate corallites.



A thick laminar colony of *Montipora incrassata*.



A close view showing corallites and tuberculae.

Montipora nodosa (Dana, 1846)

Chinese Name 柱節表孔珊瑚
Family Acroporidae
Publication *Manopora nodosa* Dana (1846)
Synonymy *Montipora nodosa* Ma (1959); Veron & Wallace (1984); Veron (1986); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are massive or thick, unifacial, laminar plates. Corallites are a mixture of forms, being immersed and exsert. Calices are 0.7-1.3 mm in diameter, surrounded by thecal papillae that are fused into tubes, which in turn may be fused with the theca. Septa are in two complete cycles, from 1/2-2/3R. Septal spines are arranged in rows, with those of the first cycle being thicker than the second one. Reticulum is coarse, either spongy or spinulate. Reticulum and thecal papillae are present, both bearing highly elaborated spinules.

Living colonies are pale brown.

Ecology

Usually found on shallow reef environment, but is usually uncommon.

Occurrence

Southern Taiwan and Penghu Islands.

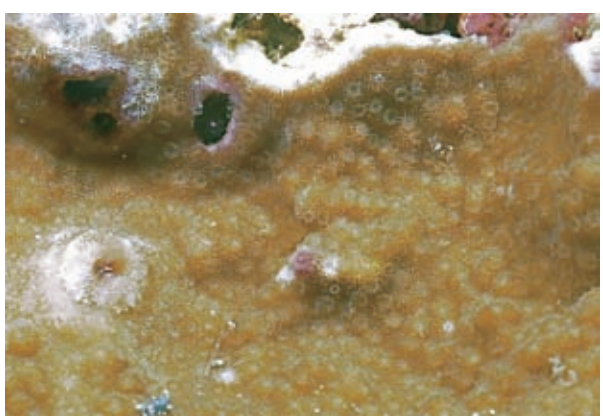
Distribution

Widely distributed throughout the Pacific, from the Indonesian Archipelago to Taiwan, eastward to Fiji and Easter Island. Also recorded from the Red Sea.

Remarks

This species is similar to *M. hispida*, but the latter has different growth forms, and when colonies are plate-like, the plates are much thinner. It also resembles *M. grisea*, but the latter is distinguished by their smaller corallites, more numerous and finer reticulum papillae.

A digitate colony of *Montipora nodosa*.



A close view of colony surface showing corallites and thecal papillae.

Montipora spumosa (Lamarck, 1816)

Chinese Name 泡沫表孔珊瑚
Family Acroporidae
Publication *Porites spumosa* Lamarck (1816)
Synonymy *Montipora spumosa* Vaughan (1918); Ma (1959); Veron & Wallace (1984); Veron (1986); Nishihira & Veron (1995); Veron (2000)
Montipora guppyi Eguchi (1938); Ma (1959)

Taxonomic Description & Diagnosis

Colonies are encrusting, and may develop upward columnar or plate-like branches. Plate-like branches are always convoluted and may be bifacial; columnar ones are often hollow tubes composed of irregularly fused ridges. Rootlets are usually developed in encrusting colonies. Corallites are immersed, irregularly distributed and widely spaced. Calices are 0.6-0.8 mm in diameter. Septa are arranged in two orders, with the secondary septa being incomplete or absent. Primary septa are <2/3R, and bear irregular, widely spaced spines. Irregular tuberculae may be developed in between ridges and larger mounds on colony surface. Coenosteum is coarse, with highly elaborated spinules and uniform in structure.

Living colonies are usually brown, cream, or blue, either uniformly colored or mottled. Sometimes they may have distinctly colored margins.

Ecology

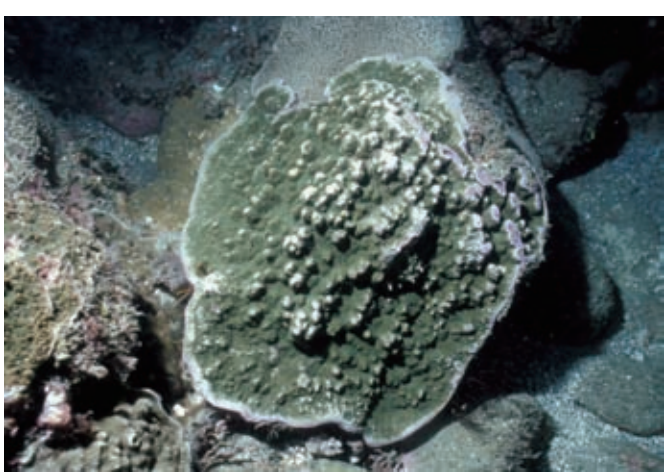
Occurs in most reef environments.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

Widely distributed throughout the Indo-Pacific, from east Africa to French Polynesia.



An encrusting colony of *Montipora spumosa*.

A close view of colony surface.

Acropora aculeus (Dana, 1846)

Chinese Name 尖銳軸孔珊瑚
Family Acroporidae
Publication *Madrepora aculeus* Dana (1846)
Synonymy *Acropora aculeus* (Dana); Faustino (1927); Nemenzo (1967); Wallace (1978); Veron and Wallace (1984); Veron (1986); Wallace and Dai (1997); Wallace (1999)
Specimen MTQ: G45895, Penghu, Chinwan; G45914, Maoao; G45927, Shenao; G47587 -8, Ludao, Haisenping; G47589, Ludao, Chaikochiao; TUIO: CC7245, Penghu, Chinwan; C7246, Maoao; C7247 -9, Ludao.

Taxonomic Description & Diagnosis

Flattened, corymbose colonies to about 40 cm diameter, with very slender vertical branchlets. Branching corymbose, short slender branchlets up to 4 mm diameter and 50 mm length, arising from a horizontal plate or table; axial corallites outer diameter 1.6-2.4 mm, inner diameter 0.8-1.0 mm, primary septa to 2/3 R, secondary septa absent or some present to 1/3 R; radial corallites regularly sized and arranged on branches, not touching, appressed tubular with round openings; primary septa to 1/2 R, secondary septa absent to just visible; coenosteum dense reticulate with simple spinules or lines of simple spinules throughout.

Known colors bright blue, bright yellow-green, brown, or blue-gray.

Ecology

Occurs subtidally on reef slopes.

Occurrence

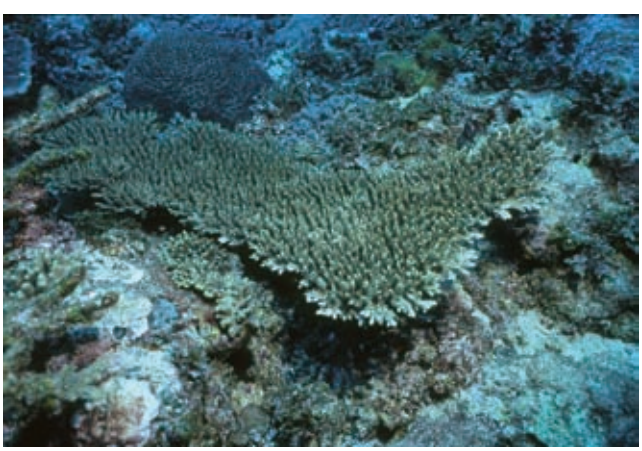
All reef areas around Taiwan.

Distribution

Widely distributed throughout the Indo-Pacific.

Remarks

This species co-occurs with A. *latistella*. Sometimes the 2 species can only be distinguished in the laboratory.



A corymbose colony of *Acropora aculeus*.

A close view of branches.

Acropora acuminata (Verrill, 1864)

Chinese Name 繁枝軸孔珊瑚
Family Acroporidae
Publication *Madrepora acuminata* Verrill (1864)
Synonymy *Acropora acuminata* (Verrill); Verrill (1902); Wells (1954); Veron and Wallace (1984); Veron (1986); Wallace and Dai (1997); Wallace (1999)
Specimen MTQ: G43849, G45834, G45842, Nanwan, Tiaoshi; G47582, Ludao, Haisenping; G47590, Ludao, Chaikochiao; G47601, Ludao, Nanliao; TUIO: C7190, C7191, Nanwan, Tiaoshi; C7192 -4, Ludao.

Taxonomic Description & Diagnosis

Small arborescent table; branches appear prickly because of occasional protruding radial corallites. Branches widely separated and arching upwards, maximum diameter 10 mm; axial corallites outer diameter 1.6 to 2.9 mm, inner diameter 0.6-1.0mm, primary septa to 2/3 R, secondary septa to 1/3 R; radial corallites mostly not touching on branch, tubular with oval to nariform openings; some radial corallites longer than average, primary septa to 1/2 R, secondary septa to 1/4 R; coenosteum costate on radial corallites, with spinules on costae; reticulate with occasional simple spinules between radial corallites.

Known colors brown or blue.

Ecology

Found subtidally on reef slopes.

Occurrence

Southern Taiwan, Ludao, Lanyu. Xiaoliuchiu, Dongsha Atoll, Taiping Island.

Distribution

Distributed throughout eastern Indian Ocean and the west Pacific.

Remarks

As noted by Wells (1954), specimens of this species tend to blacken on exposure to air.

An arborescent table of *Acropora acuminata*.

A close view of branches with protruding radial corallites.

Acropora austera (Dana, 1846)

Chinese Name 簡單軸孔珊瑚
Family Acroporidae
Publication *Madrepora austera* Dana (1846)
Synonymy *Acropora austera* (Dana); Verrill (1902); Wallace (1978); Veron and Wallace (1984); Veron (1986); Wallace and Dai (1997); Wallace (1999)
Specimen MTQ: G35497, Nanwan; G45788, G45806, Tiaoshi; G45944, Ludao, Nanliao; G47583 -4, Ludao, Haisenping; G47597 -8, Ludao, Chaikochiao; TUIO: C7202 -3, Nanwan, Tiaoshi; C7104 -8, Ludao.

Taxonomic Description & Diagnosis

Hispidose to arborescent, sometimes forming large thickets several meters across; corallites large and obvious, with obvious calices. Irregular branching; axial corallites outer diameter 2.4-3.8 mm, inner diameter 1.0-1.5 mm, primary septa to 2/3 R, secondary septa to 1/2 R; radial corallites rounded tubular, with round to square calices, primary septa to 1/3 R, directive septa may be larger, secondary cycle absent to incomplete; coenosteum dense reticulate with scattered elaborate spinules throughout, sometimes slightly costate on radial corallites.

Known colors pale brown; sometimes with yellow radial corallites and purple axial corallites, or lavender.

Ecology

Found in subtidal habitats.

Occurrence

Southern Taiwan, Ludao, Lanyu, Dongsha Atoll

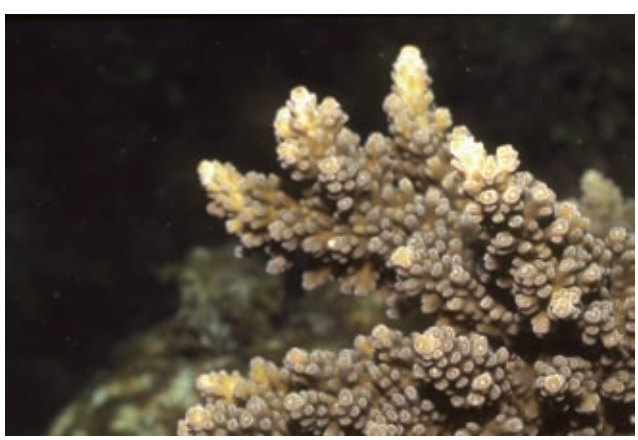
Distribution

Widely distributed throughout the Indo-Pacific.

Remarks

This is a common species on the southeastern reefs of Taiwan.

An arborescent colony of *Acropora austera*.



A close view of axial and radial corallites.

Acropora azurea Veron and Wallace, 1984

Chinese Name 天藍軸孔珊瑚
Family Acroporidae
Publication *Acropora azurea*, Veron & Wallace (1984)
Synonymy *Acropora azurea* Veron and Wallace (1984); Veron (1986); Wallace & Dai (1997); Wallace (1999); Veron (2000)
Specimen MTQ: G35495, Nanwan

Taxonomic Description & Diagnosis

Small rounded colonies with slender branches up to 5.5 mm in diameter. Caespitose branching, branches up to 80 mm long and 5 mm in diameter, mainly vertical from a solid base; axial corallites outer diameter 1.5-1.8 mm, inner diameter 0.6-0.8 mm, primary septa to 3/4 R, secondary septa absent or a few just visible; radial corallites primary septa to 2/3 R, secondary septa absent to some present to 1/4 R; coenosteum dense reticulate with simple spinules or lines of simple spinules throughout.

Known color bright blue.

Ecology

Found intertidally or just subtidally on reef edge.

Occurrence

Nanwan Bay in southern Taiwan, Ludao, Dongsha Atoll, Taiping Island.

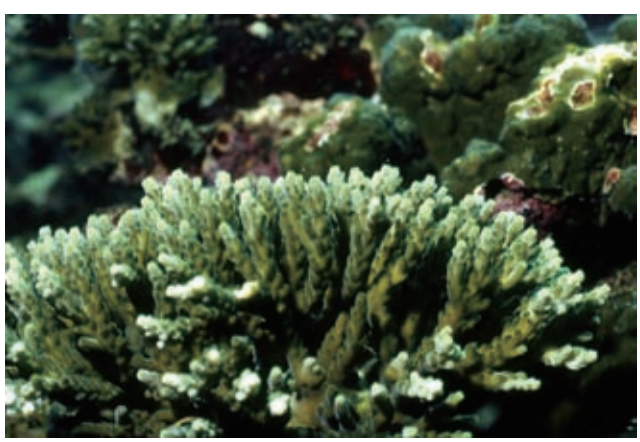
Distribution

Found only in Taiwan, southern Japan, and east Australia.

Remarks

This species is very similar to *A. nana*, and may be a synonym. This is the first record of this species outside the Great Barrier Reef.

A small colony of *Acropora azurea.*



Branches of *Acropora azurea.*

Acropora clathrata (Brook, 1891)

Chinese Name 方格軸孔珊瑚
Family Acroporidae
Publication *Madrepora clathrata* Brook (1891)
Synonymy *Acropora clathrata* (Brook); Wallace (1978); Veron & Wallace (1984); Veron (1986); Wallace & Dai (1997); Wallace (1999); Veron (2000)
Specimen MTQ: G43847, Nanwan, Tiaoshi; G45940, Ludao, Nanliao; G47575 -6, Ludao, Haisenping; G47593, Ludao, Chaikochiao; TUIO: C7271, Nanwan, Tiaoshi; C7272 -5, Ludao.

Taxonomic Description & Diagnosis

Large tables or side-attached plates with a very flat surface. Tabulate, branching beyond the stalk entirely horizontal or almost so, branches anastomosed and flattened, diameter 6-10 mm; axial corallites outer diameter 1.6-3.0 mm, inner diameter 0.5-0.9 mm, primary septa to 1/3 R, secondary septa absent or a few just visible as points; radial corallites evenly sized or of mixed sizes, closely arranged on branches, nariform or appressed tubo-nariform, sometimes with rostrate developments in the form of single or double extensions to the outer corallite wall, primary septa absent or a few just visible as points, secondary septa absent; coenosteum costate or lines of densely arranged laterally flattened or forked spinules on radial corallites, reticulate with scattered spinules in intercorallite areas.

Known colors brown, blue, lavender, or green.

Ecology

Found subtidally on reef tops, slopes, and walls, to about 15 m depth.

Occurrence

Southern Taiwan, Ludao, Lanyu, Dongsha Atoll, Taiping Island.

Distribution

Widely distributed throughout the Indo-Pacific.

Remarks

This species is very distinctive and not readily confused with any other; branch thickness varies from very sturdy to quite delicate, the table top can be heavily anastomosed or open, and radial corallites vary from evenly sized and shaped to very irregular.

A tabulate colony of *Acropora clathrata*.

A close view of anastomosing branches.

Acropora cytherea (Dana, 1846)

Chinese Name 輻板軸孔珊瑚
Family Acroporidae
Publication *Madrepora cytherea* Dana (1846)
Synonymy *Acropora cytherea* (Dana); Hoffmeister (1929); Crossland (1952); Wallace (1978); Veron & Wallace (1984); Veron (1986); Wallace & Dai (1997); Wallace (1999)
Specimen MTQ: G43848, Nanwan, Tiaoshi; G45943, G45946, Ludao, Nanliao; G47609, Ludao, Haisenping; TUIO: C7222, Nanwan, Tiaoshi; C7223 -4 Ludao, Haisenping.

Taxonomic Description & Diagnosis

Forms large flat tables with low vertical branchlets and fine, crumbly structure. Tabular branching: from anastomosing, horizontal branches, groups of vertical branchlets up to 15 mm long and 2 mm in diameter are given off; axial corallites outer diameter 1.3-2.5 mm, inner diameter 0.7-1.0 mm, primary septa to 2/3 R, secondary septa absent to incomplete; radial corallites with elongate upwardly pointing lips, septa absent to a few primaries just visible; coenosteum costate on radial corallites, reticulate with scattered laterally-flattened spinules in intercorallite areas, coenosteum may also bear calcite deposits, giving the cleaned skeleton a yellowed appearance.

Known colors pale brown, less commonly pink-, yellow- green- or blue-brown, or brown-gray.

Ecology

Occurs subtidally on reef slopes and submerged reefs.

Occurrence

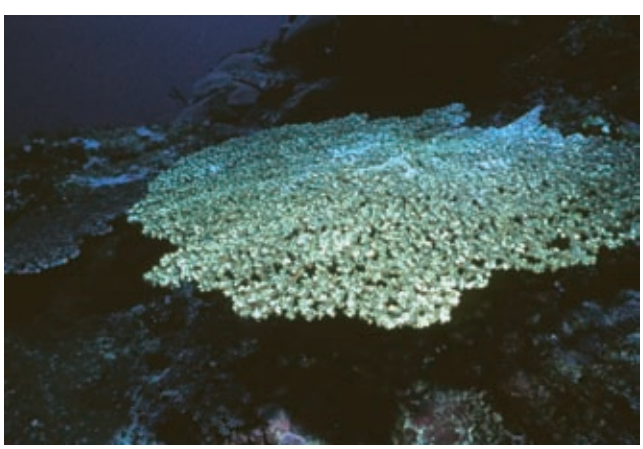
All reef areas around Taiwan except northern Taiwan.

Distribution

Widely distributed throughout the Indo-Pacific.

Remarks

This species can be confused with *A. hyacinthus*, from which it can be distinguished in the field by its crumbly structure, and by the grouping of its branchlets into 2s and 3s; in the laboratory, it is separated by its scattered radial corallites with elongate lips.



A flat table of *Acropora cytherea* (Nanwan).

A close view of the edge of a colony.

Acropora danai (Edwards and Haime, 1860)

Chinese Name 達氏軸孔珊瑚
Family Acroporidae
Publication *Madrepora danai* Edwards and Haime (1860)
Synonymy *Acropora danai* (Edwards and Haime); Wells (1954); Veron & Wallace (1984); Veron (1986); Wallace & Dai (1997); Wallace (1999)
Specimen MTQ: G45810, Nanwan, Tiaoshi; TUIO: C7172, Nanwan, Tiaoshi.

Taxonomic Description & Diagnosis

Colonies consist of thick main branching units which proliferate distally as short branchlets. Broad branches extend horizontally and proliferate into small, fused branchlets distally, some upright branches at center of colony; axial corallites outer diameter 2.0-2.5 mm, inner diameter 0.7-1.2 mm, primary septa to 2/3 R, secondary septa to 1/4 R; radial corallites dimorphic: long tubular corallites with dimidiate openings are interspersed with subimmersed forms: dimorphism most obvious towards edge of colony, primary septa to 1/3 R, secondary septal cycle incomplete or absent, to 1/4 R; coenosteum dimorphic: costate on radials, reticulate between.

Known colors brown or pinkish-brown.

Ecology

Found on shallow reef tops and edges.

Occurrence

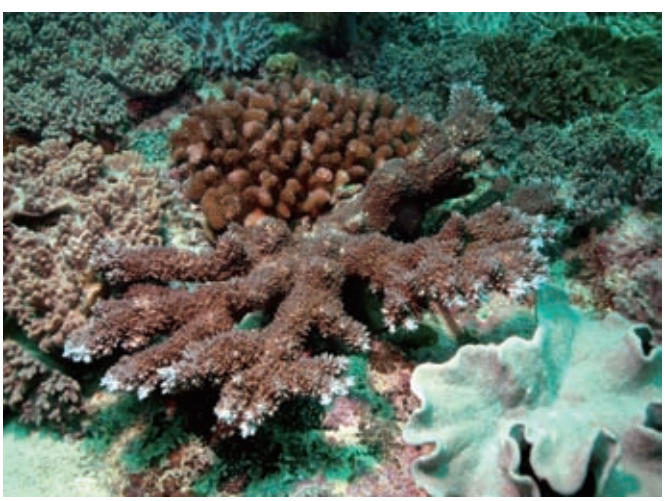
Southern Taiwan, Ludao, Lanyu, and Dongsha Atoll.

Distribution

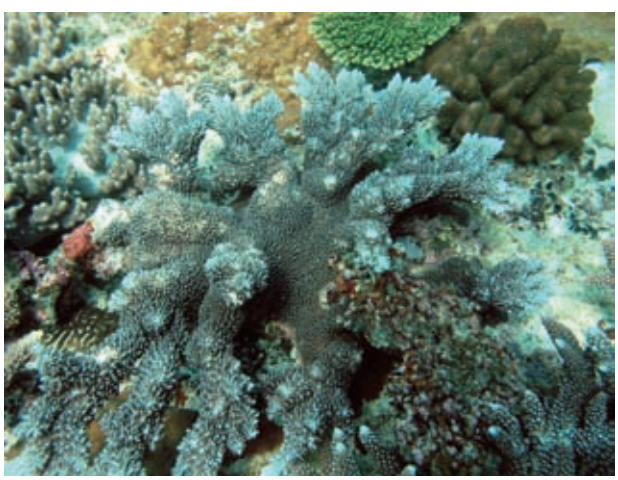
Widely distributed throughout the Indo-Pacific.

Remarks

This species co-occurs with *A. robusta*; the 2 species are very similar in all characters except the proliferation of small branches at the branch tips in *A. danai*, and *A. danai* never has the green/pink coloration seen in many *A. robusta* colonies.



A colony of *Acropora danai* with broad branches (Dongsha).



A colony of *Acropora danai* with broad base.

Acropora digitifera (Dana, 1896)

Chinese Name 指形軸孔珊瑚
Family Acroporidae
Publication *Madrepora digitifera* Dana (1846)
Synonymy *Acropora digitifera* (Dana); Verrill (1902); Crossland (1952); Wells (1954); Nemenzo (1967); Veron & Wallace (1984); Veron (1986); Wallace & Dai (1979); Wallace (1999)
Specimen MTQ: G45816 -7, Penghu; G35492, Nanwan; TUIO: C7164, Penghu.

Taxonomic Description & Diagnosis

Colonies digitate to corymbose; branches short and thin relative to those of other members of group; radial corallites closely arranged on branches. Corymbose, branches moderately tapering, up to 20 mm diameter; axial corallites outer diameter 2.8-3.8 mm, inner diameter 0.8-1.6 mm, primary septa to 2/3 R, secondary septa incomplete to 1/4 R; radial corallites dimidiate, evenly arranged closely together with thickened walls and little or no inner wall so that lower wall looks like a lip; primary septa to 3/4 R, secondary septa incomplete to 1/4 R; coenosteum a dense arrangement or laterally flattened spinules, sometimes formed into costae, throughout.

Known colors cream or pale brown, usually with blue tips.

Ecology

Found in intertidal reef top locations

Occurrence

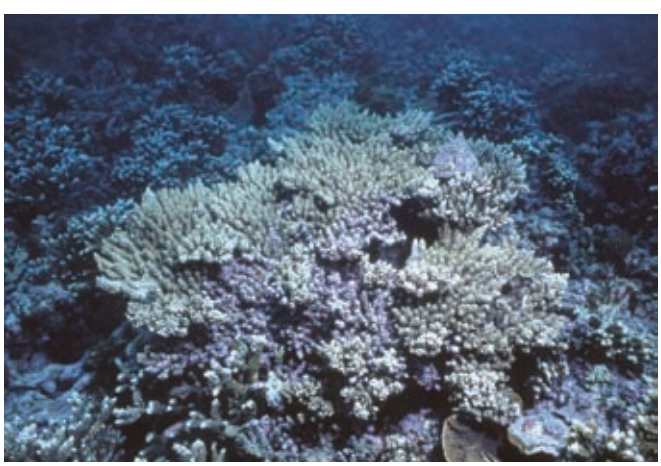
All reef areas around Taiwan.

Distribution

Widely distributed throughout the Indo-Pacific.

Remarks

Specimens from Penghu are irregular in colony shape with some long branches and thicker than usual radial corallite walls.



Corymbose colony of *Acropora digitata* (Nanwan).

A close view of branches showing axial and radial corallties.

Acropora divaricata (Dana, 1846)

Chinese Name 兩叉軸孔珊瑚
Family Acroporidae
Publication *Madrepora divaricata* Dana (1846)
Synonymy *Acropora divaricata* (Dana); Wallace (1978); Veron & Wallace (1984); Veron (1986); Wallace & Dai (1997); Wallace (1999)
Specimen MTQ: G45805, Nanwan, Tiaoshi; G47608, Penghu, Fenguei; TUIO: C7276, Penghu, Fenguei

Taxonomic Description & Diagnosis

Colonies have a distinctive divergent branching pattern within a bracket or rounded arborescent table. Branching open caespito-corymbose with branches up to 15 mm diameter curving and anastomosing to form a network within the colony; axial corallites outer diameter 1.8-3.0 mm, inner diameter 0.7-1.1 mm, primary septa to 1/2 R, secondary septa to 1/4 R; radial corallites evenly sized and spaced on branches, just touching, nariform, with large, open calices; distal radial corallites are tubo-nariform and towards the base of branches they may be appressed tubular; sometimes walls extended outwards by a rostrate development, primary septa to 1/2 R, secondary septa to 1/4 R; coenosteum reticulate with dense arrangement of rows of laterally flattened or forked spinules on radial corallites, reticulate with spinules less densely arranged in intercorallite areas.

Known colors brown or greenish brown, usually with blue branch tips.

Ecology

Found subtidally on reef slopes.

Occurrence

All reef areas around Taiwan.

Distribution

Widely distributed throughout the Indo-Pacific.

Remarks

The few specimens of this species recorded in Taiwan may actually be juveniles of *Acropora solitaryensis.*

A colony of *Acropora divaricata* with divergent branching pattern (Penghu).

A close view of branches.

Acropora donei Veron and Wallace, 1984

Chinese Name 董氏軸孔珊瑚
Family Acroporidae
Publication *Acropora donei* Veron & Wallace (1984)
Synonymy *Acropora donei* Veron and Wallace (1984); Veron (1986); Nishihira & Veron (1995); Wallce & Dai (1997); Wallace (1999); Veron (2000)
Specimen MTQ: G43839 -40, G45821 -4, Nanwan, Tiaoshi; G45942, G45945, Ludao, Nanliao; G47591, Ludao, Chaikochiao; TUIO: C7214 -7 Nanwan, Tiaoshi; C7218 -20 Ludao.

Taxonomic Description & Diagnosis

Large arborescent tables or side-attached plates up to 3 m in diameter. Open corymbose branching, the branches widely spaced and up to 5 mm in diameter; axial corallites outer diameter 2.5-4.2 mm, inner diameter 1.0-1.4 mm, primary septa to 2/3 R, secondary septa to 1/3 (sometimes 2/3 R); radial corallites scattered, cochleariform but with lip reduced, primary septa to 1/2 R, secondary septa to 1/3 R; coenosteum costate or lines of simple spinules on radial corallites, reticulate with scattered simple spinules in intercorallite areas.

Known colors cream, gray, or white, sometimes white with bright blue branch tips.

Ecology

Occurs subtidally.

Occurrence

Southern Taiwan, Ludao, Lanyu, Dongsha Atoll, Taiping Island.

Distribution

Distributed throughout east Indian Ocean and the west Pacific.

Remarks

This species is common throughout the South China Sea.

An arborescent table of *Acropora donei.*

Branches of *Acropora donei.*

Acropora elseyi (Brook, 1892)

Chinese Name 旁枝軸孔珊瑚
Family Acroporidae
Publication *Madrepora elseyi* Brook (1892)
Synonymy *Acropora elseyi* (Brook); Crossland (1952); Pillai & Scheer (1976); Wallace (1978); Veron & Wallace (1984); Wallace & Dai (1997); Wallace (1999)
Specimen MTQ: G45777, Penghu; G45833, Nanwan, Tiaoshi; TUIO: C7287, Nanwan, Tiaoshi.

Taxonomic Description & Diagnosis

Colonies have irregular hispidose shape ranging from compact "bottlebrush" branches to shrubby and arborescent forms. Hispidose branching pattern, branchlets of irregular length; axial corallites outer diameter 1.6-3.2 mm, inner diameter 0.5-1.0 mm, primary septa to 2/3 R, secondary septa only a few present, to 1/4 R; radial corallites appressed tubular with oblique openings and slightly thickened outer wall, primary septa present to 1/3 R, secondary septa absent to a few just visible; coenosteum both on and between radials is a dense arrangement of elaborate spinules.

Known colors white, brown with white branch tips, brown, or bright yellow.

Ecology

Found at low tide and shallow subtidal habitats.

Occurrence

Southern Taiwan, Penghu Islands, Ludao.

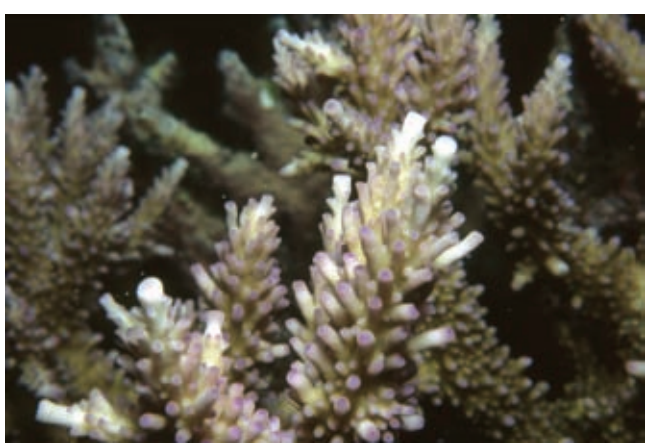
Distribution

Distributed throughout east Indian Ocean and the Pacific. Also recorded from the Maldives and Hawaii.

Remarks

At the Penghu Islands, the large assemblages of variable *Acropora muricata* may also contain some colonies of *A. elseyi.*

A colony of *Acropora elseyi* with irregular hispidose branches (Penghu).



Hispidose branching pattern of *Acropora elseyi.*

Acropora florida (Dana, 1846)

Chinese Name 佛州軸孔珊瑚
Family Acroporidae
Publication *Madrepora florida* Dana (1846)
Synonymy *Acropora florida* (Dana); Wallace (1978); Veron & Wallace (1984); Veron (1986); Wallace & Dai (1997); Wallace (1999); Veron (2000)
Specimen MTQ: G43845, Nanwan, Tiaoshi; G45913, Maoao; G45926, Shenao; G45933 -4, Ludao, Haisenping; TUIO: C7288, Nanwan, Tiaoshi; C7289, Shenao; C7290, Maoao; C7291 -2, Ludao

Taxonomic Description & Diagnosis

Colonies have sturdy upright or horizontal hispidose branches (mostly horizontal in Taiwan colonies). Branches hispidose with evenly distributed short secondary branches; axial corallites outer diameter 2.0-3.0 mm, inner diameter 0.8-1.4 mm, primary septa to up to 2/3 R, secondary septa to 1/2 R; radial corallites evenly sized and distributed, with rounded lower wall, approaching a lipped shape, primary septa to 1/2 R, secondary septa to 1/4 R; coenosteum costate on radial corallites, reticulate in intercorallite areas.

Known colors greenish or pinkish brown, yellow or brown.

Ecology

Found subtidally on reef tops and slopes.

Occurrence

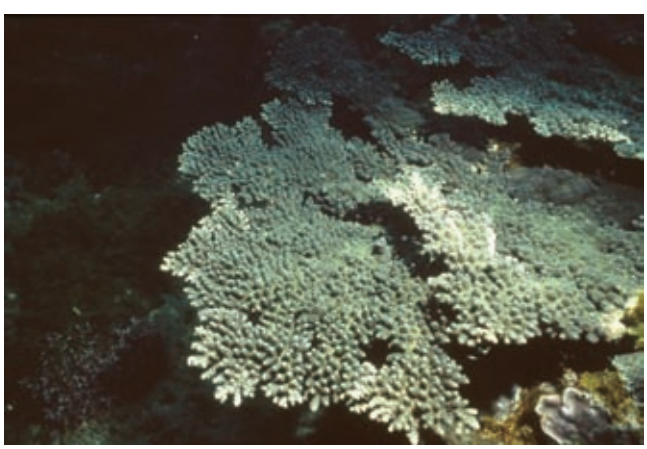
All reef areas around Taiwan.

Distribution

Widely distributed throughout the Indo-Pacific.

Remarks

This is a very broadly distributed species. On Taiwan reefs, colonies usually occur as tables with the separate branching units still being recognized. The secondary branches are only developed on the upper surface.



A colony of *Acropora florida* (Nanwan).

Horizontal hispidose branches of *Acropora florida.*

Acropora gemmifera (Brook, 1892)

Chinese Name 芽枝軸孔珊瑚
Family Acroporidae
Publication *Madrepora gemmifera* Brook (1892)
Synonymy *Acropora gemmifera* (Brook); Vaughan (1918); Crossland (1952); Veron & Wallace (1984); Veron (1986); Wallace & Dai (1997); Wallace (1999); Veron (2000)
Specimen MTQ: G45843, Nanwan, Tiaoshi; G47592, G47611, Ludao, Chaikochiao; TUIO: C7158, Nanwan, Tiaoshi; C7159, C7160, Ludao, Chaikochiao

Taxonomic Description & Diagnosis

Sturdy, digitate to corymbose colonies; large axial corallites and 2 distinct sizes of radial corallites are obvious. Branches up to 25 mm diameter and tapering; axial corallites outer diameter 2.8-4.2 mm, inner diameter 1.0-1.3 mm, primary septa to 3/4 R, secondary septa to 2/3 R; 2 sizes of radial corallites: larger radial corallites short tubular, with dimidiate openings and thickened walls, smaller radial corallites sub-immersed, primary septa to 3/4 R, secondary septa incomplete to 1/4 R; coenosteum a dense arrangement of laterally flattened elaborated spinules, sometimes formed into costae, throughout.

Known colors cream, brown, blue, purple, cream with blue tips.

Ecology

Found in reef top and upper slope habitats.

Occurrence

Southern Taiwan, Ludao, Lanyu, Dongsha Atoll, Taiping Island.

Distribution

Widely distributed throughout the Indo-Pacific.

Remarks

It is often difficult to distinguish between the 2 species *Acropora humilis* and *A. gemmifera* (see remarks in Wells 1954, Wallace 1978, Veron and Wallace 1984).

A sturdy, digitate colony of *Acropora gemmifera.*

A close view of branches.

Acropora glauca (Brook, 1893)

Chinese Name 板葉軸孔珊瑚
Family Acroporidae
Publication *Madrepora glauca* Brook (1893)
Synonymy *Acropora glauca* (Brook); Veron & Wallace (1984); Veron (1986); Wallace & Dai (1997); Wallace (1999)
Specimen MTQ: G45794 -7, G45802 -3, G45847, G47606, Penghu; G47612, Ludao, Chaikochiao; TUIO: C7168 -9, Penghu; C7170, Ludao.

Taxonomic Description & Diagnosis

Colonies corymbose to anastomosed corymbose plates with side to central attachment; radial corallites very evenly shaped and arranged. Corymbose with branches short and terete up to 16 mm in diameter; axial corallites outer diameter 3.1-4.1 mm, inner diameter 1.0-1.3 mm, primary septa to 3/4 R, secondary septa to 2/3 R, occasionally a 3rd cycle is partially developed; radial corallites evenly distributed, equal in shape and size, appressed rounded tubular with large round openings, primary septa to 3/4 R, secondary septa to 1/2 R; coenosteum reticulate or finely costate throughout.

Known color pale cream, brown, or dark green.

Ecology

Found on reef tops and upper slopes

Occurrence

All reef areas around Taiwan and offshore islets.

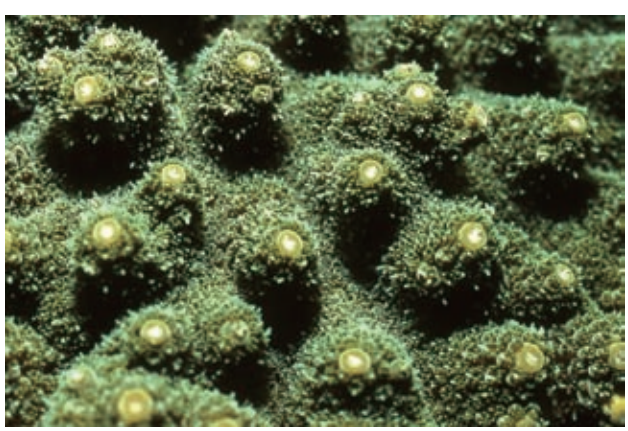
Distribution

Recorded in Taiwan, Japan, reefs of the South China Sea, Australia, French Polynesia, and Madagascar.

Remarks

Records indicate that this species is restricted to fringing reef. It is a common species on reefs of Taiwan.

A colony of *Acropora glauca* with corymbose plates (Penghu).



A close view of branches showing axial and radial corallites.

Acropora humilis (Dana, 1846)

Chinese Name 趾形軸孔珊瑚
Family Acroporidae
Publication *Madrepora humilis* Dana (1846)
Synonymy *Acropora humulis* (Dana); Crossland (1952); Wells (1954); Nemenzo (1967); Zou (1975); Veron & Wallace (1984); Veron (1986); Wallace & Dai (1997); Wallace (1999)
Specimen MTQ: G45814, Penghu; G45905, Penghu, Fenguei; G35500, Nanwan, Tiaoshi; G45936, Ludao, Chaikochiao; TUIO: C7155, Penghu; C7156, Penghu, Fenguei; C7157, Ludao.

Taxonomic Description & Diagnosis

Sturdy, digitate to corymbose colonies with large obvious axial corallites. Branches up to 30 mm diameter and tapering; axial corallite outer diameter 3.0-8.0 mm, inner diameter 1.0-1.6 mm, primary septa to 1/2 R, secondary septa to 1/4 R; radial corallites evenly distributed, short tubular with dimidiate openings and thickened walls, primary septa to 1/3 R, secondary septa incomplete, to 1/4 R; coenosteum a dense arrangement of laterally flattened elaborated spinules, sometimes formed into costae, throughout.

Known colors cream, brown, blue, purple, cream with blue tips, yellow-green; found in reef top and upper slope habitats.

Ecology

Found in reef top and upper slope habitats.

Occurrence

All reef areas around Taiwan except northern Taiwan.

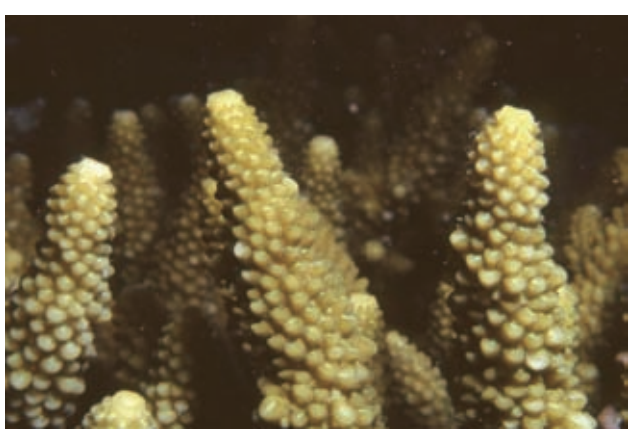
Distribution

Widely distributed throughout the Indo-Pacific.

Remarks

This is a very variable species and specimens from Taiwan reflect this; the Penghu specimens, in particular, have very thick-walled, crowded radial corallites and relatively thin and elongate branches.

A digitate colony of *Acropora humilis*.



Branches of *Acropora humilis*

Acropora hyacinthus (Dana, 1846)

Chinese Name 桌形軸孔珊瑚
Family Acroporidae
Publication *Madrepora hyacinthus* Dana (1846)
Synonymy *Acropora hyacinthus* (Dana); Wells (1954); Nemenzo (1967); Wallace (1978); Veron & Wallace (1984); Veron (1986); Wallace & Dai (1997); Wallace (1999)
Acropora spicifera (Dana); Nemenzo (1967)
Specimen MTQ: G45798 -800, G45812, Penghu; G35496, Nanwan; G43842 -3, G46533, Nanwan, Tiaoshi; G47581, Ludao, Haisenping; G47600, Ludao, Nanliao; TUIO: C7226 -7, Nanwan, Tiaoshi; C7228 -9, Ludao

Taxonomic Description & Diagnosis

Colonies are large tables or plates with a flat top on which the short, regular, rosette-like branchlets can be seen. Tabular branching: from anastomosing, horizontal branches, vertical branchlets up to 15 mm long and 2 mm in diameter are given off; axial corallites outer diameter 1.4-2.0 mm, 0.5-1.1 mm, primary septa to 3/4 R, secondary septa absent or some present to 1/4 R; radial corallites crowded on branchlets, labellate with flaring lip and arranged in neat rosette around axial corallite, primary septa to 1/2 R, secondary septa to 1/4 R; coenosteum costate on radial corallites, reticulate with scattered laterally-flattened spinules in intercorallite areas.

Known colors brown, brown with blue or pink edges, or blue.

Ecology

Occurs intertidally on reef flats and subtidally on upper reef slopes and submerged reefs.

Occurrence

All reef areas around Taiwan except northern Taiwan.

Distribution

Widely distributed throughout the Indo-Pacific.

Remarks

Included with this species are some specimens from Penghu with a caespito-corymbose form and longer than usual branchlets. These specimens, like the unusual A. *formosa* specimens referred to above, indicate unusual environmental conditions and/or differentiation events in the Taiwan Strait.

Large tabular colonies of *Acropora hyacinthus* (Nanwan).

A close view of branches.

Acropora intermedia (Brook, 1891)

Chinese Name 中間軸孔珊瑚
Family Acroporidae
Publication *Madrepora intermedia* Brook (1891)
Synonymy *Acropora intermedia* (Brook); Crossland (1952); Wallace (1978); Wallace & Dai (1997); Wallace (1999)
Acropora nobilis (Dana); Veron & Wallace (1984)
Specimen MTQ: G43838, G43846, Nanwan, Tiaoshi; G47617, Nanwan; G47580, Ludao, Haisenping; G47599, Ludao, Chaikochiao; G45947, Ludao, Nanliao; TUIO: C7173 -4, Nanwan, Tiaoshi; C7175, Ludao, Haisenping; C7176, Ludao, Chaikochiao; C7177, Ludao, Nanliao.

Taxonomic Description & Diagnosis

Arborescent, forming compact colonies or large thickets; radial corallite dimorphism and dimidiate openings of large radials clearly visible. Arborescent branches given off at wide angles (45- to 90-), up to 25 mm diameter and tapering gradually; axial corallites outer diameter 2.5-4.0 mm, inner diameter 0.8-1.1 mm, primary septa to 2/3 R, secondary septa to 1/4 R; radial corallites dimorphic: long tubular radial corallites with dimidiate or oblique openings primary septa to 2/3 R, secondary septa to 1/4 R; between these are immersed corallites in which septa are hardly visible; coenosteum strongly costate on radial corallite walls, reticulate between corallites.

Known colors cream, brown, pale green, or blue.

Ecology

Found in most subtidal reef locations.

Occurrence

Southern Taiwan, Ludao, Lanyu, Dongsha Atoll, Taiping Island.

Distribution

Widely distributed throughout the Indo-Pacific.

Remarks

This species was recorded as *Acropora nobilis* (Dana, 1846) by Veron and Wallace (1984, p. 214). Many of the colonies from Taiwan do not always have the distinctive dimidiate openings to the radial corallites that are usual in this species: instead, most long radials have oblique openings, so that the colonies may be easily confused with *A. formosa.*

An arborescent colony of *Acropora intermedia*.

A close view of branches.

Acropora latistella (Brook, 1892)

Chinese Name 盤枝軸孔珊瑚
Family Acroporidae
Publication *Madrepora latistella* Brook (1892)
Synonymy *Acropora latistella* (Brook); Hoffmeister (1925); Crossland (1952); Veron & Wallace (1984); Veron (1986); Wallace & Dai (1997); Wallace (1999)
Specimen MTQ: G35541 Kenting National Park; G45906 -12, Maoao; G45923 -5, Shenao; G47610, Ludao, Haisenping; "anastomosed form": G45928, G45929, Shenao; TUIO: C7230 -6, Maoao; C7237 -9, Shenao; C7240, Ludao.

Taxonomic Description & Diagnosis

Corymbose colonies with slender branches. Corymbose branching, with compactly arranged terete branches up to 40 mm in length and 5 mm in diameter, forming thick plates with a side attachment; axial corallites outer diameter 2.0-3.0 mm, inner diameter 0.6-0.9 mm, primary septa to 3/4 R, secondary septa to 1/2 R; radial corallites as a group with well developed septa, primary septa to 1/2 R, secondary to 1/4 R; coenosteum lines of spinules both on radial corallites and in intercorallite areas.

Known colors brown, yellow, yellow-gray, blue, or blue-brown.

Ecology

Occurs subtidally on outer reef flats, reef slopes and submerged reefs.

Occurrence

All reef areas around Taiwan.

Distribution

Widely distributed throughout the Indo-Pacific.

Remarks

In situations of strong current, the branches of the table become fully anastomosed, so that the colony forms a solid plate.

A corymbose colony of *Acropora latistella* (Nanwan).

A close view of branchlets.

Acropora listeri (Brook, 1893)

Chinese Name 列枝軸孔珊瑚
Family Acroporidae
Publication *Madrepora listeri* Brook (1893)
Synonymy *Acropora listeri* (Brook); Thiel (1932); Veron & Wallace (1984); Wallace & Dai (1997); Wallace (1999)
Specimen MTQ: G47595, Ludao, Chaikochiao; G35493, Nanwan; G35494, Nanwan, Hsiangchiaowan; TUIO: C7178, Ludao, Chaikochiao

Taxonomic Description & Diagnosis

Colonies irregular subarborescent to corymbose; colony up to 0.5 m in diameter. Branches irregular in size and may have incipient branchlets developed along them; axial corallites outer diameter 2.5-4.0 mm, inner diameter 0.8-1.0 mm; radial corallites dimorphic: long tubular radial corallites with dimidiate or oblique openings, primary septa to 2/3 R, secondary septa to 1/4 R; between these are immersed corallites in which septa are hardly visible; coenosteum strongly costate on radial corallite walls, reticulate between corallites.

Known colors cream or brown.

Ecology

Found on reef edges.

Occurrence

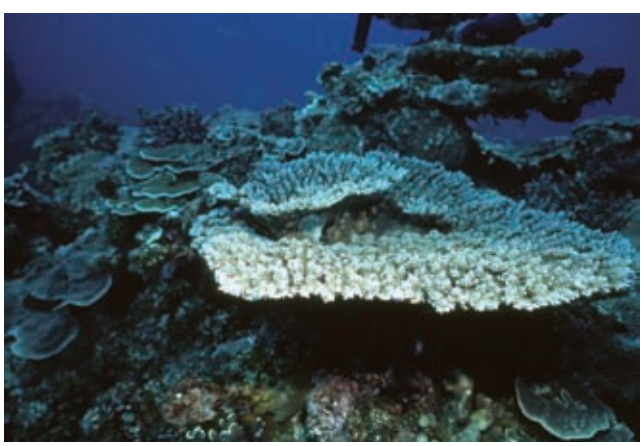
All reef areas around Taiwan except northern Taiwan.

Distribution

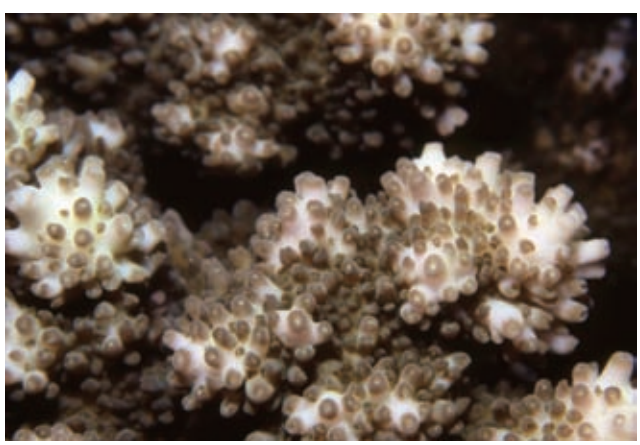
Widely distributed throughout the Indo-Pacific, west from Sri Lanka.

Remarks

There is some possibility that this species may be a synonym of *A. polystoma* (Brook 1891) (see Veron and Wallace 1984).



An arborescent colony of *Acropora listeri*.



A close view of branches with dimorphic radial corallites.

Acropora lutkeni Crossland, 1952

Chinese Name 粗短軸孔珊瑚
Family Acroporidae
Publication *Acropora lutkeni* Crossland (1952)
Synonymy *Acropora lutkeni* Crossland (1952); Veron & Wallace (1984); Veron (1986); Wallace & Dai (1997); Wallace (1999)
Specimen MTQ: G43853, Nanwan, Tiaoshi; G45937, G47596, Ludao, Chaikochiao; G47579, Ludao, Haisenping; TUIO: C7267, Nanwan, Tiaoshi; C7268 -70, Ludao.

Taxonomic Description & Diagnosis

Corymbose to irregular caespitose colonies with sturdy branches in which can be seen the mixture of corallite lengths. Irregular branching, with sturdy branches up to 45 mm in diameter, arising from a central to side-attached base but ending at different heights, sometimes corymbose; axial corallites outer diameter 2.6-4.3 mm, inner diameter 0.7-1.2 mm, primary septa to 2/3 R, secondary septa to 1/3 R; radial corallites in mixed sizes up to 5 mm long, touching or just separated on branches, tubular with mostly rounded or slightly nariform openings, primary septa to 1/3 R, secondary septa to 1/2 R; coenosteum a dense arrangement of laterally flattened spinules on radial corallites, reticulate with flaky spinules in intercorallite areas.

Known colors brown, purple, or blue.

Ecology

Found on reef edge or subtidally on upper slopes and submerged reefs.

Occurrence

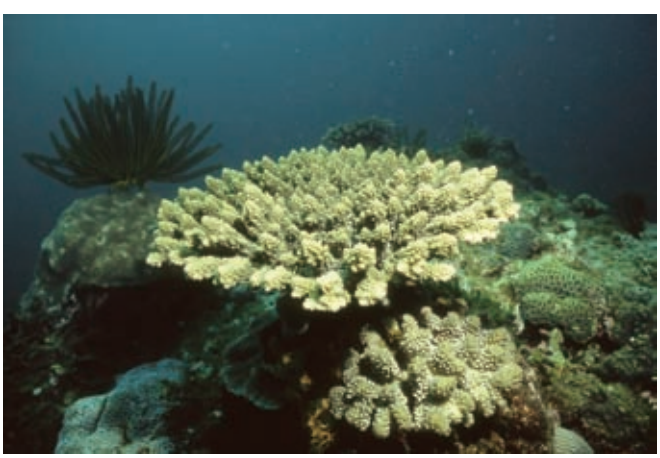
All reef areas around Taiwan except northern Taiwan.

Distribution

Distributed throughout east Indian Ocean and the west Pacific.

Remarks

Because of the irregular mode of growth, the appearance of colonies is variable, which makes *A. lutkeni* a difficult species to identify in the field. Corymbose colonies can be confused with *A. secale.*



A colony of *Acropora lutkeni*.

Irregular and sturdy branches of *Acropora lutkeni.*

Acropora microclados (Ehrenberg, 1846)

Chinese Name 灌叢軸孔珊瑚
Family Acroporidae
Publication *Heteropora microclados* Ehrenberg (1834)
Synonymy *Acropora microclados* (Ehrenberg); Veron & Wallace (1984); Veron (1986); Nishihira & Veron (1995); Wallace & Dai (1997); Wallace (1999); Veron (2000)
Specimen MTQ: G43854, Nanwan, Tiaoshi; TUIO: C7225, Nanwan, Tiaoshi.

Taxonomic Description & Diagnosis

Colonies thick plates: difficult to identify in the field. Tabular or corymbose branching, with branches up to 8 mm in length and 5 mm in diameter; axial corallites outer diameter 1.3-1.8 mm, inner diameter 0.7-0.9 mm, primary septa to 1/2 R, secondary septa incomplete, to 1/4 R; many radial corallites are nariform or tubular with nariform openings rather than labellate, primary septa to 1/3 R, secondary septa absent or some present to 1/4 R; coenosteum costate on radial corallites, reticulate with scattered simple spinules or lines of spinules in intercorallite areas.

Ecology

Probably a reef-edge species.

Occurrence

Southern Taiwan, Ludao, Lanyu.

Distribution

Distributed throughout the west Pacific. Also recorded from the Red Sea.

Remarks

This species is difficult to identify in the field, often being confused with *A. cerealis* or slender branching forms of *A. nasuta*.

A table colony of *Acropora microclados*.

A close view of branches.

Acropora microphthalma (Verrill, 1864)

Chinese Name 小葉軸孔珊瑚
Family Acroporidae
Publication *Madrepora microphthalma* Verrill (1869)
Synonymy *Acropora microphthalma* (Verrill); Nemenzo (1967); Wallace (1978); Veron & Wallace (1984); Veron (1986); Nishihira & Veron (1995); Wallace & Dai (1997); Wallace (1999); Veron (2000)
Specimen MTQ: G45893 -4, Penghu, Chinwan; G45902, Penghu, Fengguei; G43855, G45827 -8, G46430 -1, Nanwan, Tiaoshi; G47619, Nanwan; TUIO: C7196 -8, Nanwan, Tiaoshi; C7199, C7200 -1, Penghu, Chinwan

Taxonomic Description & Diagnosis

Fine-branching dense arborescent thickets. Branching arborescent, with slender branches, up to 15 mm diameter; axial corallites outer diameter 1.8-2.3 mm, inner diameter 0.6-1.0 mm, primary septa to 3/4 R, secondary septa absent or some present to 1/4 R; radial corallites tubular with round to oblique openings, crowded on branches, primary septa to 2/3 R, secondary absent or just visible; coenosteum densely arranged simple spinules on and between radial corallites.

Known colors cream or white, occasionally pale blue.

Ecology

Found in subtidal habitats.

Occurrence

All reef areas around Taiwan except northern Taiwan.

Distribution

Widely distributed throughout the Indo-Pacific.

Remarks

This is a common species throughout the western Pacific and South China Sea. It can sometimes be confused with *A. formosa*, which differs by having sturdier branches.

A dense arborescent thicket of *Acropora microphthalma.*

Branches of *Acropora microphthalma.*

Acropora millepora (Ehrenberg, 1834)

Chinese Name 多孔軸孔珊瑚
Family Acroporidae
Publication *Heteropora millepora* Ehrenberg (1834)
Synonymy *Acropora singularis* Nemenzo (1967)
Acropora librata Nemenzo (1967)
Acropora millepora (Ehrenberg); Nemenzo (1967); Wallace (1978); Veron & Wallace (1984); Veron (1986); Nishihira & Veron (1995); Wallace & Dai (1997); Wallace (1999); Veron (2000)
Specimen MTQ: G45838, Nanwan, Tiaoshi; TUIO: C7210, Nanwan, Tiaoshi.

Taxonomic Description & Diagnosis

Corymbose colonies from a central to peripheral attachment; radial corallites very evenly distributed and sized, appearing scale-like. Corymbose branching, with terete branches up to 10 mm diameter; axial corallites outer diameter 2.4-3.9 mm, inner diameter 0.9-1.6 mm, primary septa to 1/2 R, secondary septa to 1/4 R; radial corallites equally sized labellate, with flaring lips, primary septa to 2/3 R, secondary septa to 1/4 R; coenosteum costate on radial corallites, reticulate with scattered spinules in intercorallite areas.

Known colors green with orange branch tips, orange-brown, pink, or blue.

Ecology

Found on reef flat or shallow subtidal areas.

Occurrence

Southern Taiwan, Ludao, Lanyu, Penghu Island, Dongsha Atoll.

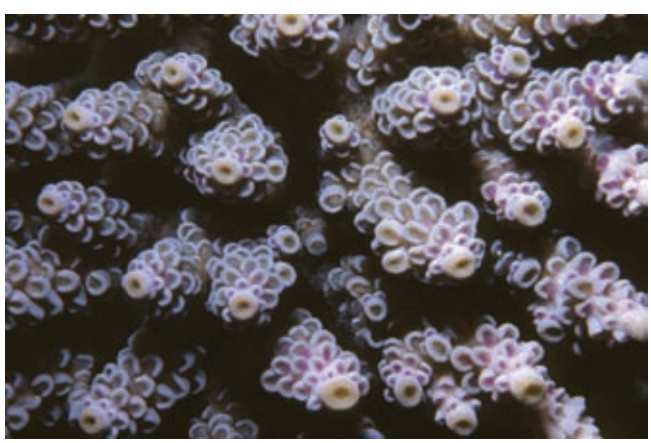
Distribution

Distributed throughout east Indian Ocean and the west Pacific.

Remarks

The specimens recorded in Taiwan correspond with the “thin-branched” morph, which is identified with *A. millepora* sensu stricto.

A corymbose colony of *Acropora millepora*.



A close view of branches with axial and radial corallites.

Acropora muricata (Dana, 1846)

Chinese Name 美麗軸孔珊瑚
Family Acroporidae
Publication *Acropora muricata* Verrill (1869)
Synonymy *Acropora formosa* (Dana); Hoffmeister (1925); Nemenzo (1967); Wallace (1978); Veron & Wallace (1984); Wallace & Dai (1997)
Acropora muricata (Dana); Wallace (1999)
Specimen MTQ: G45893 -4, Penghu, Chinwan; G45902, Penghu, Fengguei; G43855, G45827 -8, G46430 -1, Nanwan, Tiaoshi; G47619, Nanwan; TUIO: C7196 -8, Nanwan, Tiaoshi; C7199, C7200 -1, Penghu, Chinwan

Taxonomic Description & Diagnosis

Arborescent thickets with slender to moderately thick branches; radial corallites evenly sized, tubular and close together. Arborescent branching; axial corallites outer diameter 1.5-3.0 mm, inner diameter 0.6-1.2 mm, primary septa to 1/3 R, secondary septal cycle incomplete; radial corallites crowded on branches, evenly sized, tubular with small round to oval openings, primary septa to 2/3 R, secondary septa to 1/3 R; coenosteum costate or neatly arranged simple spinules on radial corallites, intercorallite areas similar, or reticulate with scattered simple spinules.

Known color brown or cream, sometimes with blue tips.

Ecology

Found intertidally and subtidally in most reef habitats.

Occurrence

All reef areas around Taiwan, but very rare in northern Taiwan.

Distribution

Widely distributed throughout the Indo-Pacific.

Remarks

This species is very common on the shallow reefs of the Penghu Islands, where there is such variability in characters, particularly length and frequency of branching, that adjacent colonies may look like separate species.

Arborescent thickets of *Acropora muricata.*

A close view of branches.

Acropora nana (Studer, 1878)

Chinese Name 細枝軸孔珊瑚
Family Acroporidae
Publication *Madrepora nana* Studer (1878)
Synonymy *Acropora nana* (Studer); Wells (1954); Wallace (1978); Veron & Wallace (1984); Veron (1986); Nishihira & Veron (1995); Wallace & Dai (1997); Wallace (1999); Veron (2000)
Specimen MTQ: G45825 -6, G45829, Nanwan, Tiaoshi; TUIO: C7241 -4, Nanwan, Tiaoshi

Taxonomic Description & Diagnosis

Small rounded corymbose colonies (maximum colony diameter around 15 cm), with slender branches. Branches 4-10 mm diameter and up to 18 mm in length, arising vertically from a solid base or short stalk; axial corallites outer diameter 1.8-2.0 mm, inner diameter 0.9-1.0 mm, primary septa to R, secondary septa to 3/4 R; radial corallites regular in size, regularly arranged and just touching, appressed tubular with round to oval openings and outer wall extended upwards, sometimes giving a nariform appearance; primary septa to 1/2 R, secondary septa to 1/4 R; coenosteum dense reticulate with simple spinules or lines of simple spinules throughout.

Known colors brown, blue, or purple.

Ecology

Found at reef edge and subtidally around the top of the reef slope.

Occurrence

Southern Taiwan, Ludao, Lanyu, Dongsha Atoll.

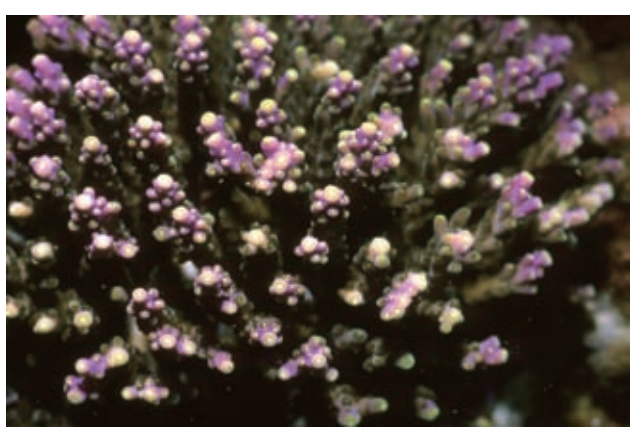
Distribution

Distributed throughout the eastern Indian Ocean and the west Pacific. Also recorded from Madagascar to Maldives.

Remarks

This is a common species in Nanwan Bay, Kenting National Park. It is restricted to the Pacific Ocean, South China Sea, and northern and eastern parts of the Indo-Australian arc.

A small colony of *Acropora nana*.



A close view of branches.

Acropora nasuta (Dana, 1846)

Chinese Name 鼻形軸孔珊瑚
Family Acroporidae
Publication *Madrepora nasuta* Dana (1846)
Synonymy *Acropora nasuta* (Dana); Wells (1954); Nemenzo (1967); Wallace (1978); Veron & Wallace (1984); Veron (1986); Nishihira & Veron (1995); Wallace & Dai (1997); Wallace (1999); Veron (2000)
Specimen MTQ: G35499 Kenting National Park; G45844 Kenting National Park, Tiaoshi

Taxonomic Description & Diagnosis

Corymbose colonies, usually with a short thick stalk. Corymbose branching, branches up to 12 mm in diameter arising from a central to side attachment; axial corallites outer diameter 2.0-3.0 mm, inner diameter 0.6-1.1 mm, primary septa to 3/4 R, secondary septa to 1/4 R; radial corallites evenly arranged nariform along branches, forming a neat rosette pattern when viewed from the branch tip, primary septa to 2/3 R, secondary septa to 1/4 R; coenosteum densely costate or lines of laterally flattened spinules on radial corallites, reticulate with scattered spinules in intercorallite areas.

Known colors pale brown with blue tips, blue, purple, or green.

Ecology

Found subtidally on reef edge, reef slope and submerged reefs.

Occurrence

All reef areas around Taiwan except northern Taiwan.

Distribution

Widely distributed throughout the Indo-Pacific.

Remarks

A. cerealis has more elongate radial corallite openings and more slender branches than *A. nasuta*, giving a spiky appearance to the colony in the field. *A. cerealis* is always a pale brown or cream in color.

A corymbose colony of *Acropora nasuta* (Nanwan).

Branches of *Acropora nasuta* showing nariform corallites.

Acropora pulchra (Brook, 1891)

Chinese Name 叉枝軸孔珊瑚
Family Acroporidae
Publication *Madrepora pulchra* Brook, 1891
Synonymy *Acropora pulchra* (Brook); Vaughan (1918); Nemenzo (1967); Zou (1975); Wallace (1978); Veron & Wallace (1984); Veron (1986); Nishihira & Veron (1995); Wallace & Dai (1997); Wallace (1999); Veron (2000)
Specimen MTQ: G45785, Penghu; G47618, Taiwan; TUIO: C7209, Penghu.

Taxonomic Description & Diagnosis

Open arborescent, thicket-like colonies, may appear corymbose when occurring at low tide mark; radial corallites scattered and not very obvious. Open to compact arborescent branching, branches up to 12 mm diameter and terete; axial corallites outer diameter 2.0-3.5 mm, inner diameter 0.6-1.2 mm, primary septa to 2/3 R, secondary cycle incomplete, to 1/4 R; radial corallites a mixture of large and small, larger corallites labellate with pointed lip, smaller corallites subimmersed with a reduced lip, primary septa to 2/3 R, secondary septa incomplete, to 1/4 R; coenosteum costate on radial corallites, open reticulate with scattered simple spinules in intercorallite areas.

Known colors brown, brown with blue tips.

Ecology

Occurs subtidally in reef flat and shallow habitats.

Occurrence

All reef areas around Taiwan.

Distribution

Widely distributed throughout the Indo-Pacific.

Remarks

This species is usually the shallowest-occurring of *Acropora*, and it may be found with rubble or algae within a few meters of the shore.

An arborescent colony of *Acropora pulchra* (Nanwan).

Branches of *Acropora pulchra*.

Acropora robusta (Dana, 1846)

Chinese Name 強壯軸孔珊瑚
Family Acroporidae
Publication *Madrepora robusta* Dana (1846)
Synonymy *Acropora robusta* (Dana); Nemenzo (1967); Wallace (1978); Veron & Wallace (1984); Veron (1986); Nishihira & Veron (1995); Wallace & Dai (1997); Wallace (1999); Veron (2000)
Specimen MTQ: G45841, Nanwan, Tiaoshi; TUIO: C7171, Nanwan, Tiaoshi.

Taxonomic Description & Diagnosis

Sturdy low arborescent colonies with digitate central branches and curving peripheral branches. Branches arborescent to digitate (depending on position in colony), 10 to 40 mm diameter; axial corallites outer diameter 2.1-3.5 mm, inner diameter 0.5-1.5 mm, primary septa to 3/4 R, secondary septa to 1/3 R; radial corallites dimorphic: long tubular corallites with dimidiate openings are interspersed with subimmersed forms: dimorphism not obvious on digitate central branches, but distinctive towards branch tips; coenosteum dimorphic: costate on radials, reticulate between.

Known colors green with pink branch tips or pale brown.

Ecology

Found on shallow reef tops and edges.

Occurrence

Dongsha Atoll, Ludao, Nanwan Bay in southern Taiwan.

Distribution

Widely distributed throughout the Indo-Pacific.

Remarks

This is a common Indo-Pacific coral which does not vary greatly throughout its range.

A low arborescent colony of *Acropora robusta* (Dongsha).

Corallites of *Acropora robusta.*

Acropora sarmentosa (Brook, 1892)

Chinese Name 短小軸孔珊瑚
Family Acroporidae
Publication *Madrepora sarmentosa* Brook (1892)
Synonymy *Acropora sarmentosa* (Brook); Nemenzo (1967); Wallace (1978); Veron & Wallace (1984); Veron (1986); Nishihira & Veron (1995); Wallace & Dai (1997); Wallace (1999); Veron (2000)
Acropora vermiculata Nemenzo (1967)
Specimen MTQ: G47613, Nanwan

Taxonomic Description & Diagnosis

Colonies usually have 1 or 2 thick, hispidose branching units which extend horizontally; large, rounded corallites can be seen in the field. Branching hispidose, branchlets more strongly developed on upper surface; axial corallites outer diameter 3.0-4.0 mm, inner diameter 1.0-2.0 mm, primary septa to 3/4 R, secondary septa to 1/2 R; radial corallites evenly sized and arranged, touching, rounded tubular, primary septa to 2/3 R, secondary septa to 1/4 R; coenosteum a dense reticulum with evenly distributed laterally flattened or slightly elaborated spinules throughout.

Known colors pinkish or greenish brown.

Ecology

Found subtidally on reef tops and slopes.

Occurrence

Southern Taiwan, Ludao, Dongsha Atoll.

Distribution

Distributed throughout east Indian Ocean and the Pacific.

Remarks

This species appears to be uncommon in Taiwan and the specimen examined shows a more open arrangement of secondary branches than that described in Wallace (1978) or Veron and Wallace (1984).

A hispidose colony of *Acropora sarmentosa.*

A close-up view of branches.

Acropora secale (Studer, 1878)

Chinese Name 穗枝軸孔珊瑚
Family Acroporidae
Publication *Madrepora secale* Studer (1878)
Synonymy *Acropora secale* (Studer); Verrill (1902); Nemenzo (1967); Scheer & Pillai (1974); Veron & Wallace (1984); Veron (1986); Nishihira & Veron (1995); Wallace & Dai (1997); Wallace (1999); Veron (2000)
Specimen MTQ: G45813, G45818, Penghu

Taxonomic Description & Diagnosis

Colonies corymbose or caespito-corymbose, side attached or with a central stalk; mixture of long tubular and short nariform corallites obvious. Corymbose or caespito-corymbose branching, branches 7-20 mm in diameter and 20-70 mm long; axial corallites outer diameter 2.4-3.3 mm, inner diameter 0.7-1.2 mm, primary septa to 3/4 R, secondary septa to 1/3 R; radial corallites a mixture of long tubular with round to nariform openings and shorter nariform, just touching and with the 2 types often arranged in separate rows along the branches, primary septa to 1/3 R, secondary septa absent or some present to 1/4 R; coenosteum a dense arrangement of spinules on radial corallites, reticulate with evenly distributed spinules in intercorallite areas.

Known colors purple with yellow corallite tips, brown, brown with blue branch tips, or green.

Ecology

Found subtidally on reef flat, edge and upper slope.

Occurrence

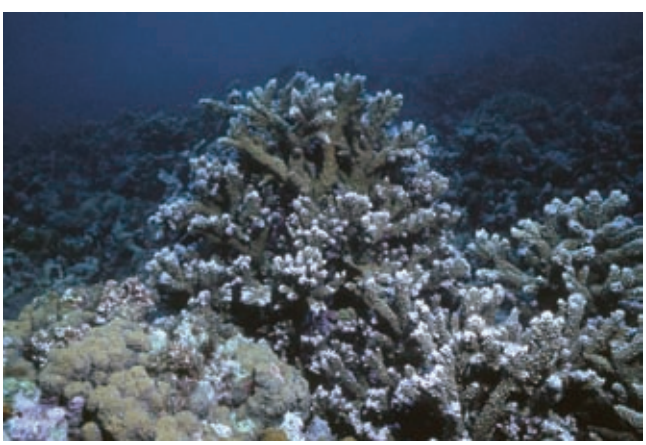
All reef areas around Taiwan except northern Taiwan.

Distribution

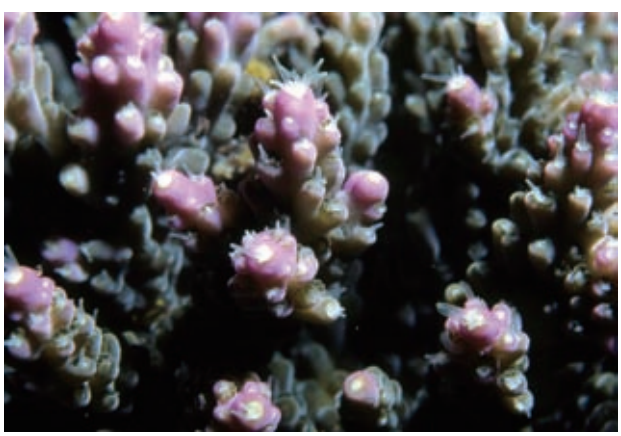
Widely distributed throughout the Indo-Pacific.

Remarks

See notes for *A. valida* regarding field separation of the 2 species.



A caespito-corymbose colony of *Acropora secale* (Penghu).



A close-up view showing axial and radial corallites.

Acropora solitaryensis Veron and Wallace, 1984

Chinese Name 單獨軸孔珊瑚
Family Acroporidae
Publication *Acropora solitaryensis* Veron and Wallace (1984)
Synonymy *Acropora solitaryensis* Veron and Wallace (1984); Veron (1986); Veron & Nishihira (1995); Wallace & Dai (1997); Wallace (1999); Veron (2000)
Specimen MTQ: G45830 -2, G45835 -7, G46532, Nanwan, Tiaoshi; G47585, Ludao, Haisenping; G47602, Shenao; G47603, Maoao; TUIO: C7277 -83, Nanwan, Tiaoshi; C7284, Ludao; C7285, Shenao; C7286, Maoao.

Taxonomic Description & Diagnosis

Occurs as stalked tables up to 3 m in diameter with widely spaced and anastomosing branchlets and large, obvious, radial corallites. Anastomosing branches with curved secondary branches rising from them; axial corallites outer diameter 1.6-3.4 mm, inner diameter 0.5-1.1 mm, primary septa to 1/2 R, secondary septa to 1/4 R; radial corallites evenly sized and arranged, large appressed tubular with nariform openings, primary septa to 1/3 R, secondary septa to 1/4 R; coenosteum reticulate with dense arrangement of rows of laterally flattened or forked spinules on radial corallites, reticulate with spinules less densely arranged in intercorallite areas.

Known colors brown or greenish brown, usually with blue edge to table.

Ecology

Found subtidally on reef slopes and submerged reefs.

Occurrence

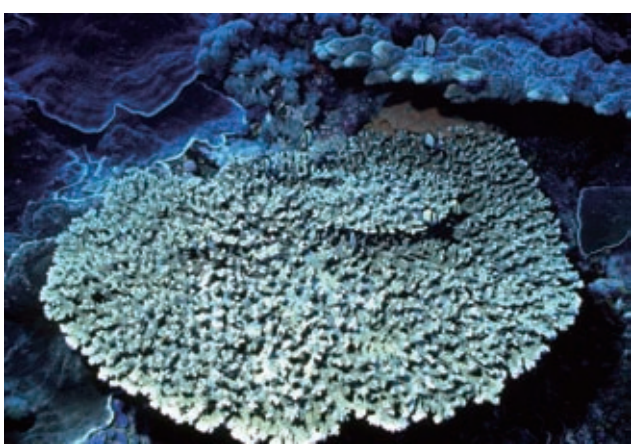
All reef areas around Taiwan, more abundant in northern reefs.

Distribution

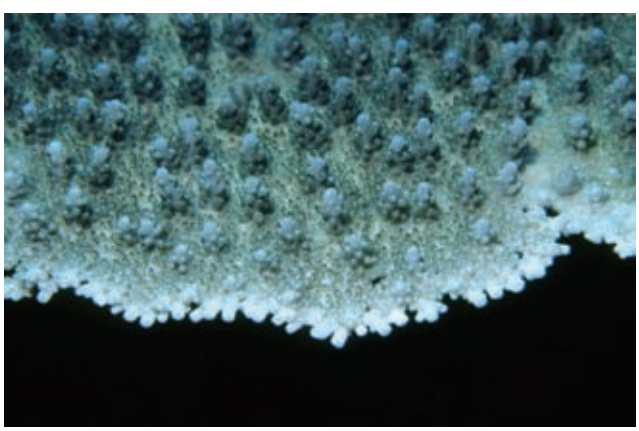
Distributed throughout east Indian Ocean and the west Pacific.

Remarks

This species looks like a flattened version of *A. divaricata*, with lower branches so much anastomosed that they sometimes form a solid plate. It is a very common species in Taiwan as well as Indonesia and the South China Sea.



A table-like colony of *Acropora solitaryensis* (Nanwan).



A close-up view of solid plate of *Acropora solitaryensis.*

Acropora subulata (Dana, 1846)

Chinese Name 淺盤軸孔珊瑚
Family Acroporidae
Publication *Madrepora subulata* Dana (1846)
Synonymy *Acropora subulata* (Dana); Stephenson & Wells (1955); Nemenzo (1967); Veron & Wallace (1984); Veron (1986); Wallace & Dai (1997); Wallace (1999)
Specimen MTQ: G45896, Penghu, Chinwan; G46530, Penghu.

Taxonomic Description & Diagnosis

Large tables with regular and well-spaced upright branches which break easily. Tabular branching: branchlets of up to 4 mm diameter and 40 mm in length extending vertically from horizontal branches; axial corallites outer diameter 1.4-1.9 mm, inner diameter 0.8-1.2 mm, primary septa to 3/4 R, secondary septa to 1/2 R; radial corallites scattered labellate or tubular with oblique calice, primary septa to 1/3 R, secondary septa to 1/4 R; coenosteum costate on radial corallites, costate or reticulate between.

Known color brown.

Ecology

Found subtidally on submerged reef tops and gentle slopes.

Occurrence

Southern Taiwan, Penghu Islands, Ludao.

Distribution

Widely distributed throughout the Indo-Pacific, west from Sri Lanka, east to the French Polynesia.

Remarks

In the field this species is sometimes confused with *A. hyacinthus* and *A. cytherea*, as the size of the tables may be similar; however, the branches of this species are longer and more widely spaced than those of the other 2 species.

A large table-like colony of *Acropora subulata* (Ludao).

Tubular branches of *Acropora subulata*.

Acropora tenuis (Dana, 1846)

Chinese Name 柔枝軸孔珊瑚
Family Acroporidae
Publication *Madrepora tenuis* Dana (1846)
Synonymy *Acropora tenuis* (Dana); Faustino (1927); Wallace (1978); Veron & Wallace (1984); Veron (1986); Wallace & Dai (1997); Wallace (1999)
Acropora macrostoma (Brook); Crossland (1952); Nemenzo (1967)
Acropora plana Nemenzo (1967)
Specimen MTQ: G43841, G45839, Nanwan, Tiaoshi; G45941, Ludao, Nanliao; TUIO: C7211 -2, Nanwan, Tiaoshi; C7213, Ludao

Taxonomic Description & Diagnosis

Corymbose to caespito-corymbose colonies with narrow branches, radial corallites evenly sized with obvious, flaring lips. Corymbose branching with terete branches up to 10 mm in diameter; axial corallites outer diameter 2.4-3.4 mm, inner diameter 0.8-1.2 mm, primary and secondary septa to 1/3 R; radial corallites evenly arranged and close together on branches, cochleariform, the lip rounded and flaring broadly; primary septa to 2/3 R, secondary septa to 1/4 R; coenosteum costate or rows of simple spinules on radial corallites, reticulate with scattered simple spinules in intercorallite areas.

Known colors pale cream, pale brown, or blue.

Ecology

Found in shallow subtidal areas.

Occurrence

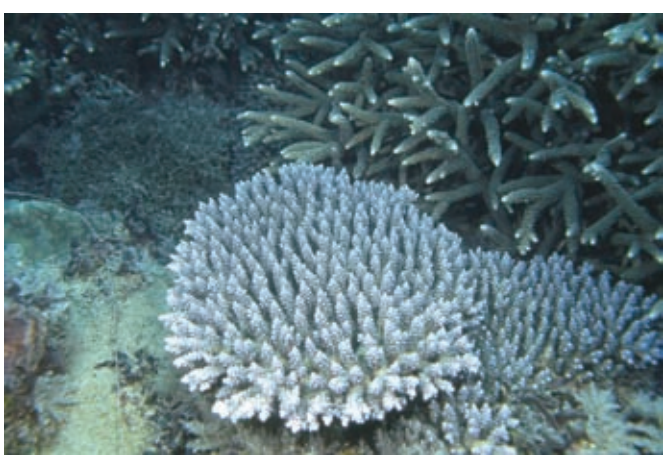
All reef areas around Taiwan except northern Taiwan.

Distribution

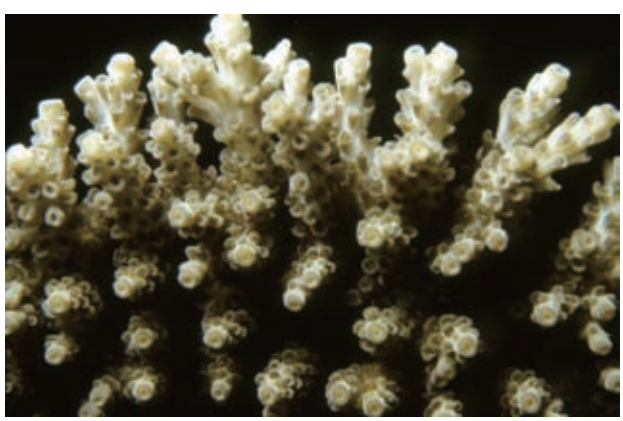
Widely distributed throughout the Indo-Pacific.

Remarks

This species can sometimes be confused in the field with *A. latistella*, from which it can be distinguished by its large, even, flaring-lipped cochleariform corallites, and by the fact that its colonies are usually pale cream or brown (the blue color is unusual).



A corymbose colony of *Acropora tenuis* (Nanwan).



Branches of *Acropora tenuis.*

Acropora valenciennesi (Edwards and Haime, 1860)

Chinese Name 華倫軸孔珊瑚
Family Acroporidae
Publication *Madrepora valenciennesi* Edwards and Haime (1860)
Synonymy *Acropora valenciennesi* (Edwards and Haime); Veron & Wallace (1984); Veron (1986)l Wallace & Dai (1997); Wallace (1999)
Acropora splendida Nemenzo (1967)
Specimen MTQ: G45903, Penghu, Fenguei; TUIO: C7195, Penghu, Fenguei.

Taxonomic Description & Diagnosis

Large open arborescent table. Branches widely separated, arching upwards; axial corallites outer diameter 2.0-3.5 mm, inner diameter 0.8-1.5 mm, primary septa to 1/3 R, secondary septa to 1/4 R; radial corallites evenly sized and distributed, tubular with oval to nariform openings, directive septa obvious, other primary septa to 1/3 R, secondary septa absent to all present to 1/4 R; coenosteum open reticulate on and between radial corallites: almost no spinules.

Known colors brown, brown with blue tips, or green with paler tips.

Ecology

Found on reef slopes and subtidal reef tops.

Occurrence

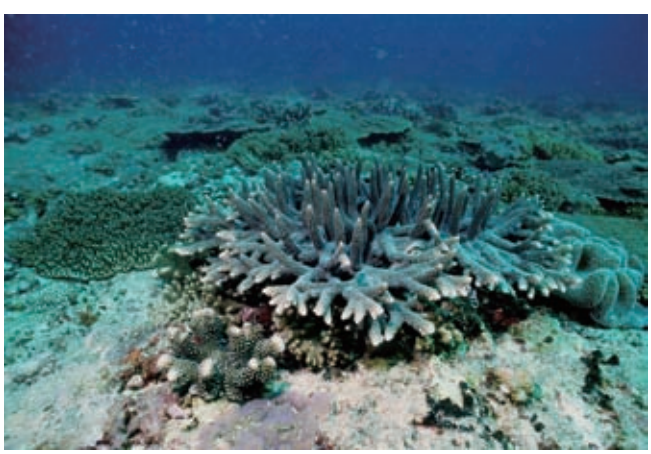
Southern Taiwan, Penghu Islands, Ludao, Lanyu, Dongsha Atoll.

Distribution

Widely distributed throughout the Indo-Pacific.

Remarks

This does not seem to be a common species in Taiwan.



An open arborescent colony of *Acropora valenciennes*i (Dongsha).

Branches of *Acropora valenciennesi.*

Acropora valida (Dana, 1846)

Chinese Name 變異軸孔珊瑚
Family Acroporidae
Publication *Madrepora valida* Dana (1846)
Synonymy *Acropora valida* (Dana); Verrill (1902); Wells (1954); Nemenzo (1967), Zou (1975); Veron & Wallace (1984); Veron (1986); Wallace & Dai (1997); Wallace (1999)
Acropora variabilis (Klunzinger); Crossland (1952); Scheer & Pillai (1974); Wallace (1978)
Specimen MTQ: G35542, G45804, G45819 -20, Nanwan, Tiaoshi; G45801, Penghu; G45815, Penghu; G45898 -901, Chinwan; G45917 -22, G47604 -5, Maoao; G45930 -2, Shenao; G45939, Ludao, Nanliao; G47416 Keelung; G47577 -8, Ludao, Haisenping; G47594, Ludao, Chaikochiao; TUIO: C7250 -2, Nanwan, Tiaoshi; C7253 -7, Penghu; C7258 -61, Maoao; C7262 -3, Shenao; C7264 -6, Ludao.

Taxonomic Description & Diagnosis

Small rounded corymbose to caespito-corymbose colonies or thick tables. Corymbose to caespito-corymbose branches, 7-20 mm diameter; axial corallites outer diameter 1.6-2.8 mm, inner diameter 0.7-0.9 mm, primary septa to 1/2 R, secondary septa to 1/3 R; radial corallites similar sizes or a mixture of sizes, crowded on branch, appressed tubular or tubo-nariform, with rounded to slightly elongate openings, primary septa to 2/3 R, secondary septa to 1/4 R; coenosteum reticulate with densely and evenly arranged spinules throughout.

Known colors purple with yellow corallite tips or purple, brown, or green.

Ecology

Found on outer reef flat, reef edge, and subtidally on upper reef slope and submerged reefs.

Occurrence

All reef areas around Taiwan.

Distribution

Widely distributed throughout the Indo-Pacific.

Remarks

The purple and yellow color combination is also seen in some colonies of *A. secale*, so that the 2 species are sometimes difficult to distinguish in the field. *A. valida* has more slender branches and lacks the prominent tubular radial corallites of *A. secale*.

A corymbose colony of *Acropora valida* (Nanwan).

Branches of *Acropora valida.*

Acropora verweyi Veron and Wallace, 1984

Chinese Name 小叢軸孔珊瑚
Family Acroporidae
Publication *Acropora verweyi* Veron and Wallace (1984)
Synonymy *Acropora verweyi* Veron & Wallace (1984); Veron (1986); Wallace & Dai (1997); Wallace (1999)
Specimen MTQ: G43851, Nanwan, Tiaoshi; G45915 -6, Maoao; TUIO: C7156 Nanwan, Tiaoshi; C7167, Maoao

Taxonomic Description & Diagnosis

Small, irregular caespitose colonies up to 30 cm in diameter, with obvious radial corallites because of wide open calices and thickened walls. Caespitose, with branches terete, to 9 in mm diameter; axial corallites outer diameter 2.8-3.5 mm, inner diameter 0.8-1.1 mm, primary septa to 3/4 R, secondary septa present to 1/2 R or reduced and incomplete; radial corallites evenly sized, tubular appressed with round openings, wall around opening a little thickened; primary septa to 1/4 R, secondary septa absent or a few just visible as points; coenosteum evenly distributed with simple spinules throughout.

Known color cream or pale brown with yellow or purple axial polyps.

Ecology

Found in reef top habitats.

Occurrence

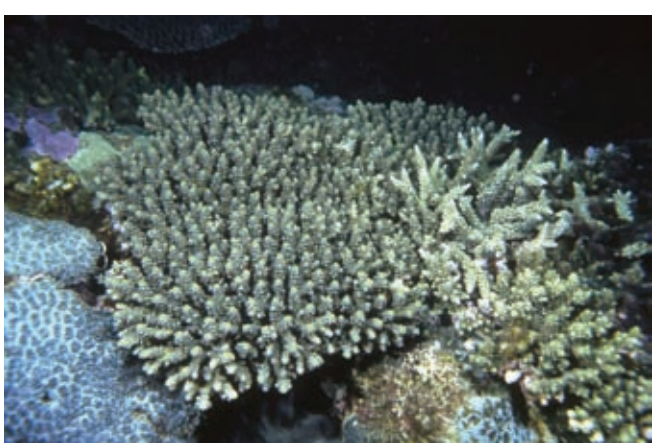
All reef areas around Taiwan.

Distribution

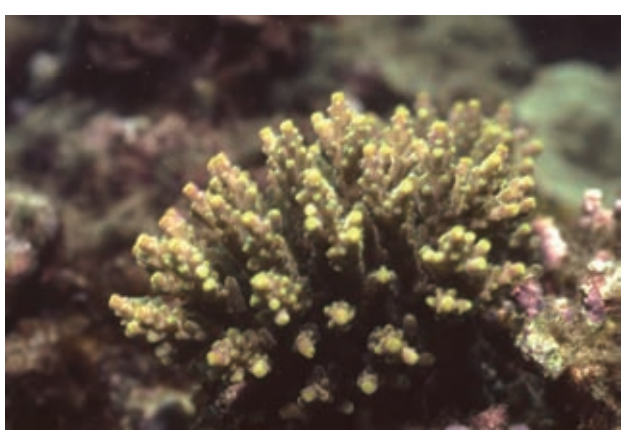
Widely distributed throughout the Indo-Pacific.

Remarks

This species tends to occur within a limited reef zone toward the seaward edge of reef tops, where it can be quite common.



A colony of *Acropora verweyi* (Nanwan).



Branches of *Acropora verweyi.*

Acropora yongei Veron and Wallace, 1984

Chinese Name 楊氏軸孔珊瑚
Family Acroporidae
Publication *Acropora yongei* Veron and Wallace (1984)
Synonymy *Acropora yongei* Veron & Wallace (1984); Veron (1986); Wallace & Dai (1997); Wallace (1999)
Specimen MTQ: G47586, Ludao, Haisenping; TUIO: C7221, Ludao

Taxonomic Description & Diagnosis

Colonies open arborescent, sometimes forming thickets, sometimes small patches. Arborescent branching, the branches up to 15 mm in diameter; axial corallites outer diameter 2.2-3.5 mm, inner diameter 0.8-1.2 mm, primary septa to 2/3 R, secondary septa to 1/3 R; radial corallites primary septa to 1/2 R, sometimes to R, secondary septa to 1/2 R, sometimes incomplete; coenosteum costate or lines of simple spinules on radial corallites, reticulate with scattered simple spinules in intercorallite areas.

Known colors pale brown, yellow-brown, pink-brown, or cream, sometimes with polyps colored differently.

Ecology

Occurs subtidally.

Occurrence

Southern Taiwan, Ludao, Lanyu.

Distribution

Distributed throught east Indian Ocean and the west Pacific. Also recorded from Madagascar to Maldives.

An arborescent colony of *Acropora yongei* (Ludao).

Branches of *Acropora yongei.*

Acropora aspera (Dana, 1846)

Chinese Name 矛枝軸孔珊瑚
Family Acroporidae
Publication *Madrepora aspera* Dana (1846)
Synonymy *Acropora manni* Nemenzo (1967)
Acropora hebes Vaughan (1918); Crossland (1952); Wells (1954); Nemenzo (1967)
Acropora aspera Crossland (1952); Nemenzo (1967); Veron & Wallace (1984); Veron (1986); Nishihira & Veron (1995); Wallace (1999); Veron (2000)
Acropora yaeyamaensis Eguchi & Shirai (1977)

Taxonomic Description & Diagnosis

Colonies are arborescent to caespitose from protected biotopes, but becomes corymbose from exposed reefs and when occurring at low tide mark; when corymbose, branch height is often related to tidal height. Branches are tapering, 5-18 mm in diameter, and up to 18 cm in length. Axial corallites: outer diameter 3.5-4.5 mm, inner diameter 1.0-1.8 mm, primary septa to 2/3R, secondary septa to 1/3R, tertiary cycle partially developed. Radial corallites: a mixture of two types and sizes, touching on shorter branches and not touching on long arborescent branches, larger radial corallite has lower wall thickened as arounded lip, smaller radial corallite is sub-immersed to immersed, primary septa to 1/3R, secondary septa incomplete, to 1/4R. Coenosteum costate on radial corallites, open reticulate with laterally flattened spinules scattered in intercorallite areas.

Known colors pale blue-grey, green or cream.

Ecology

Occurs in most reef environments, especially reef flats and shallow lagoons.

Occurrence

Southern Taiwan, Ludao, Lanyu, Dongsha Atoll, Taiping Island.

Distribution

Widely distributed throughout the Indo-Pacific, from Chagos Archipelago, to Marshall Islands, and Samoa.

Remarks

Corymbose *A. aspera* resembles *A. millepora*, but the latter is distinguished by having radial corallites of one type. *A. aspera* also resembles *A. pulchra*, but the latter is distinguished by finer, smaller radial corallites.

A large colony of *Acropora aspera* (Nanwan).

A close-up view of the branches.

Acropora cerealis (Dana, 1846)

Chinese Name 黍軸孔珊瑚
Family Acroporidae
Publication *Madrepora cerealis* Dana (1846)
Synonymy *Acropora cerealis* Nemenzo (1967); Wallace (1978); Veron & Wallace (1984); Veron (1986); Wallace (1999); Nishihira & Veron (1995); Veron (2000)
Acropora hystrix Wells (1954)
Acropora tizardi Wells (1954); Zou (1975)
Specimen MTQ: G45935, Ludao, Haisenping; G45938, Lutao, Nanliao; TUIO: C7293 -4, Ludao

Taxonomic Description & Diagnosis

Colonies are corymbose with central or side attachment, branches regularly spaced, or caespito-corymbose, branches irregularly sprawled. Branches terete to slightly tapering, 4-10 mm in diameter and up to 50 mm long. Axial corallites: outer diameter 1.0-2.2 mm, inner diameter 0.3-0.8 mm, primary septa to 2/3R, secondary septa to 1/4R. Radial corallites: evenly and neatly arranged and uniform in size, just touching and appressed tubular with nariform to slightly elongate openings, outer wall extends outward and sometimes hooked upward, outer diameter 1.0-1.9 mm, inner diameter 0.6-0.8 mm, primary septa to 1/3 R, secondary septa absent or just visible as spines. Coenosteum costate or densely arranged lines of laterally flattened spinules.

Known colors are pale brown, cream, green-brown or yellow-brown, with branch tips purple, pink, blue or cream.

Ecology

Found mostly on upper reef slopes and outer reef flats.

Occurrence

Southern Taiwan, Xiaoliuchiu, Penghu Islands, Ludao, Lanyu

Distribution

Widely distributed throughout the Indo-Pacific.

Remarks

A. cerealis is similar to *A. nasuta*, but the former is distinguished by its thinner branches and the extended outer radial corallite walls, giving it a spiny appearance.

A colony of *Acropora cerealis* (Nanwan).

Branches of *Acropora cerealis.*

Acropora derawanensis Wallace, 1997

Chinese Name 細緻軸孔珊瑚
Family Acroporidae
Publication *Acropora derawanensis* Wallace (1997)
Synonymy *Acropora derawanensis* Wallace (1999); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are arborescent to irregular hispidose, with upright or prostrate, tapering branches that may be intertwined. Branches are thin and delicate, 2-4 mm in diameter and up to 80 mm long. Axial corallites: outer diameter 1.1-1.4 mm, inner diameter 0.5-1.0 mm, primary septa to 3/4R, secondary septa absent to complete, to 1/4R. Radial corallites: scattered with only up to 10 per branch, not touching and of uniform size, appressed tubular with round openings, primary septa to 1/4R, secondary septa absent or with a few just visible as spines. Coenosteum is covered with fine spinules which are mostly densely arranged in lines and occasionally joining as costae.

Known colors brown, reddish-brown or blue, with blue or white branch tips.

Ecology

Occurs in shallow protected reef environments, especially in lagoon areas.

Occurrence

Only found in the lagoon of Dongsha Atoll.

Distribution

Distributed mainly in the west Pacific, from the Indonesia Archipelago, to Papua New Guinea.

Remarks

The slender and delicate branches of *A. derawanensis*, with the upright branching mode, make it the most fragile *Acropora*.

An arborescent colony of *Acropora derawanensis* (Dongsha).

A close-up view of branches.

Acropora echinata (Dana, 1846)

Chinese Name 刺刷軸孔珊瑚
Family Acroporidae
Publication *Madrepora echinata* Dana (1846)
Synonymy *Acropora echinata* Vaughan (1918); Eguchi (1938); Wells (1954); Nemenzo (1967); Wallace (1978); Veron & Wallace (1984); Veron (1986); Nishihira & Veron (1995); Wallace (1999); Veron (2000)
Acropora procumbens Nemenzo (1967)

Taxonomic Description & Diagnosis

Colonies are hispidose, composed of irregularly dividing, prostrate or sprawling, sometimes intertwined bottlebrush branches. Main branches are up to 35 mm wide and 100 mm long, with branchlets 1.5-3.0 mm wide and up to 20 mm long. Axial corallites: outer diameter 0.8-1.8 mm, inner diameter 0.5-1.0 mm, primary septa to 2/3R, secondary septa absent or just a few are visible. Radial corallites: not touching and uniform in sizes, evenly distributed, appressed tubular with large round, oval or nariform openings; radials are immersed on main branches, primary septa to 1/4 R, secondary septa absent or just visible as spines. Coenosteum on and between radials may be perforate, costate, or with spinules arranged in lines.

Ecology

Occurs mostly in protected reef environments with clear water, such as sandy slopes and lagoon floors.

Occurrence

Only found in the lagoon of Dongsha Atoll.

Distribution

Widely distributed throughout the Indo-Pacific, from Madagascar to Marshall Islands and Fiji.

Remarks

A. echinata is similar to *A. subglabra*, but the former is distinguished by its broader, less contracted calices, lighter structured corallite walls and coenosteum.

Hispidose colonies of *Acropora echinata* (Dongsha).

Branches of *Acropora echinata* with tubular corallites.

Acropora exquisita Nemenzo, 1971

Chinese Name 纖細軸孔珊瑚
Family Acroporidae
Publication *Acropora exquisita* Nemenzo (1971)
Synonymy *Acropora exquisita* Veron (1992); Nishihira & Veron (1995); Veron (2000)

Taxonomic Description & Diagnosis

Compact arborescent thickets of variable shapes, with delicate upright branches, giving off branchlets that are mostly perpendicular to the main branches. Branches and branchlets gradually tapering into axial corallites, branches 9.5 mm in diameter and 100 mm long. Axial corallites: 3.5 mm exert, outer diameter 3.0-4.0 mm, inner diameter about 0.8 mm, primary septa < 1/2R, secondary septa incomplete, appear as low ridges against the corallite wall. Radial corallites: dimorphic, the larger ones are 2 mm in diameter and 4-5 mm high, tubular with oblique to vertical or slightly oval openings appearing as flaring lips, those radials just under the axial are bent slightly outward; the smaller ones are 1 mm in diameter and height, thin-walled with round to vertical openings appearing scale-like. Coenosteum perforate in upper portion, dense in lower portion, covered with fine, blunt spinules.

Ecology

Occurs in shallow protected reef environments, especially lagoons.

Occurrence

Only found in the lagoon of Dongsha Atoll.

Distribution

Widely distributed throughout the Indo-Pacific, from the Cocos Island to Marshall Islands, and Fiji.

Remarks

A. exquisita is similar to *A. muricata* in the position of the corallites, but corallites are stouter, much taller, and more dispersed in the former.

A small colony of *Acropora exquisita*.

Acropora exquisita growing on sandy bottom.

Acropora grandis (Brook, 1892)

Chinese Name 巨枝軸孔珊瑚
Family Acroporidae
Publication *Madrepora grandis* Brook (1892)
Synonymy *Acropora grandis* Crossland (1952); Wallace (1978); Veron & Wallace (1984); Veron (1986); Wallace (1999); Nishihira & Veron (1995); Veron (2000)
Acropora dispar Nemenzo (1967)

Taxonomic Description & Diagnosis

Arborescent thickets with thick upright to prostrate branches; branches tapering, 5-25 mm in diameter and up to 400 mm long. Colonies from exposed reefs may be up to 7 m across, with very thick branches; colonies from inshore waters are relatively small, with large, widely spaced, crumbly corallites. Corallites become increasingly smaller and more calcified in increasing exposed habitats. Axial corallites: outer diameter 1.5-3.0 mm, inner diameter 0.8-1.7 mm, primary septa to 3/4R, secondary septa absent or incomplete, to 1/4R. Radial corallites: usually not touching and variable in sizes, tubular with round to oblique openings, outer diameter 1.5-2.0 mm, inner diameter 0.8-1.2 mm, primary septa just visible, to 1/4 R, secondary septa absent. Coenosteum costate or reticulate on radial corallites, intercorallite areas reticulate with scattered simple spinules.

Ecology

Occurs in most reef environments.

Occurrence

Ludao, Dongsha Atoll, southern Taiwan.

Distribution

Widely distributed throughout the Indo-Pacific, from the Red Sea and Madagascar, to Samoa.

Remarks

A. grandis is similar to *A. muricata*, but the former is distinguished by its less developed septal cycles. It also resembles *A. intermedia* and *A. danai*, but the latter does not have tubular radials.

A colony of *Acropora grandis*.

A branch of *Acropora grandis*.

Acropora granulosa (Edwards & Haime, 1860)

Chinese Name 顆粒軸孔珊瑚
Family Acroporidae
Publication *Madrepora granulosa* Edwards & Haime (1860)
Synonymy *Acropora clavigera* Crossland (1952)
Acropora rayneri Wells (1954)
Acropora granulosa Wallace (1978); Veron & Wallace (1984); Veron (1986); Nishihira & Veron (1995); Wallace (1999); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are thin, horizontal plates, < 1 m in diameter, with side attachment and terete vertical branchlets. Branchlets are short and subdividing, supported by regularly spaced, horizontal, anastomosing branches; branchlets 3-7 mm in diameter and up to 20 mm long. Axial corallites: outer diameter 1.3-2.8 mm, inner diameter 0.4-0.9 mm, primary septa may be few to complete, to 3/4R, secondary septa absent or just a few are visible, to 1/4R. Radial corallites: scattered and usually not touching, appressed tubular with round to slightly oval openings, primary septa a few to complete, to 1/2R, secondary septa absent or with a few just visible as spines; radials on main branches are mostly sub-immersed. Coenosteum is densely covered with regularly spaced, pointed to slightly elaborated, fine spinules.

Known colors cream, pale blue, pale brown or pale grey, with branchlet tips often of different, bright colors.

Ecology

Occurs in most reef environments, especially protected reef slopes, usually below 15 m.

Occurrence

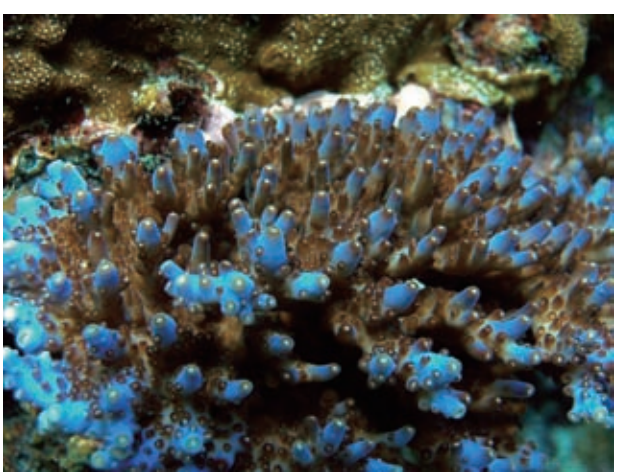
Southern Taiwan, Dongsha Atoll, Ludao.

Distribution

Widely distributed throughout the Indo-Pacific.

Remarks

A. granulosa is similar to *A. loripes*, but the former develops only plate-like colonies, has no tendency to form globular branch ends, corallites are smaller and tapering, and sometimes axial and radials are not clearly differentiated.



A colony with terete vertical branchlets (Dongsha).

A close view of the axial and radial corallites on branches.

Acropora loripes (Brook, 1892)

Chinese Name 羅立軸孔珊瑚
Family Acroporidae
Publication *Madrepora loripes* Brook (1892)
Synonymy *Madrepora murrayensis* Vaughan (1918)
Acropora murrayensis Nemenzo (1967)
Acropora squarrosa Vaughan (1918); Wallace (1978)
Acropora cancellata Crossland (1952)
Acropora loripes Veron & Wallace (1984); Veron (1986); Nishihira & Veron (1995); Wallace (1999); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are hispidose, corymbose, caespito-corymbose, or plate-like with central to lateral attachment. Branchlets are 5-12 mm in diameter and up to 45 mm long, may have thick, globular ends; sometimes the upper portion may be naked of radials. Axial corallites long, secondary axial corallites may radiate from branches, outer diameter 2.5-3.7 mm, inner diameter 0.5-1.2 mm, primary septa to 2/3R, secondary septa may be few or complete, to 1/4R. Radial corallites: mostly touching, appressed tubular with round to slightly nariform openings, primary septa to 2/3R, secondary septa absent to complete, to 1/4R; radials on main branches may be immersed to sub-immersed. Coenosteum is densely covered with elaborated, flattened spinules.

Known colors pale blue or brown, with a whitish glow to the general coloration, and axial corallites are often whitish.

Ecology

Occurs in a wide range of reef environments, most often found on subtidal reef flats and upper reef slopes.

Occurrence

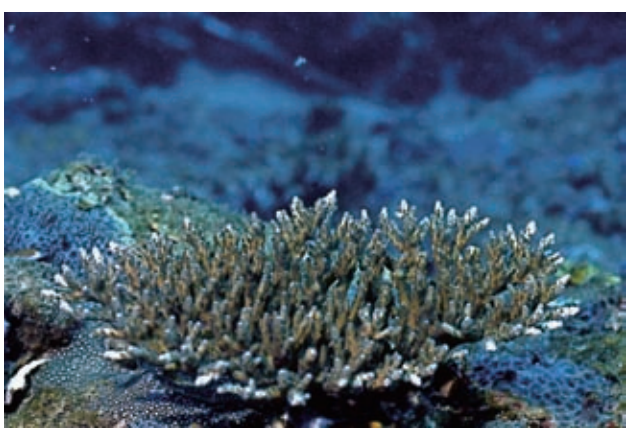
Nanwan Bay, Dongsha Atoll.

Distribution

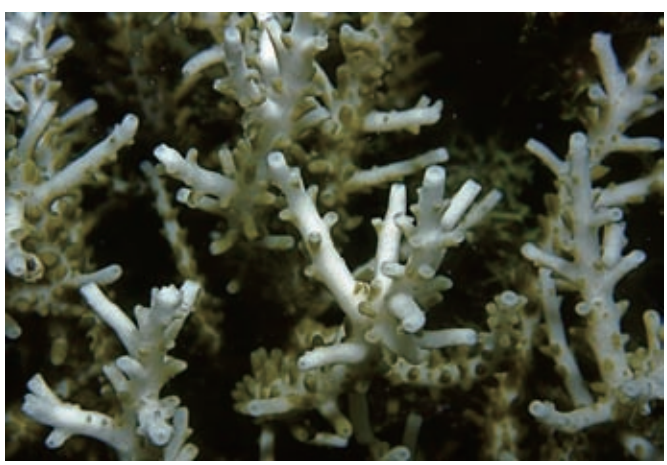
Widely distributed throughout the Indo-Pacific, from the Red Sea to the French Polynesia.

Remarks

A. loripes is similar to *A. granulosa*, but the latter develops only plate-like colonies, has no tendency to form globular branch ends, corallites are smaller and tapering, and sometimes axial and radials are not clearly differentiated.



A corymbose colony of *Acropora loripes* (Nanwan).



A close-up view showing axial and radial corallites.

Acropora monticulosa (Brüggemann, 1879)

Chinese Name 巨錐軸孔珊瑚
Family Acroporidae
Publication *Madrepora monticulosa* Brüggemann (1879)
Synonymy *Acropora monticulosa* Veron & Wallace (1984); Veron (1986); Nishihira & Veron (1995); Wallace (1999); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are sturdy, digitate with broad base to corymbose plates and side attachments. Branches strongly tapering, 13-50 mm in diameter, and up to 110 mm long. Axial corallites: outer diameter 1.4-3.8 mm, inner diameter 0.6-1.2 mm, primary septa to 3/4R, secondary septa absent or incomplete, to 1/4R. Radial corallites: uniform in size and evenly distributed, short tubular with round to slightly dimidiate openings, primary septa to 1/2R, secondary septa absent or incomplete, reduced to a few spines. Coenosteum sometimes costate on radial corallites, with laterally flattened elaborated spinules densely arranged, reticulate in intercorallite areas.

Known colors brown, cream, or lavender-brown, usually with pale branch tips.

Ecology

Found mostly on upper reef slopes, from around low tide mark to shallow reefs subjected to wave action and strong currents.

Occurrence

Southern Taiwan, Ludao, Lanyu, Penghu Islands, Dongsha Atoll, Taiping Island.

Distribution

Widely distributed throughout the Indo-Pacific, from east Africa to the French Polynesia.

Remarks

A. monticulosa is similar to *A. gemmifera* and *A. humilis*, but it is distinguished by its smaller axial corallites and smaller radial corallites of more uniform size.

A sturdy colony of *Acropora monticulosa* (Dongsha).

A close view of axial and radial corallites.

Acropora palmerae Wells, 1954

Chinese Name 葡萄軸孔珊瑚
Family Acroporidae
Publication *Acropora palmerae* Wells (1954)
Synonymy *Acropora palmerae* Veron & Wallace (1984); Veron (1986); Wallace (1999); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are sturdy and encrusting, up to 2 m in diameter, with or without short, irregular branches of 7-25 mm in diameter and up to 35 mm long. Colonies from exposed habitats have short, thick branches, with thick-walled corallites; colonies from protected biotopes have thin and irregularly sprawling branches, with thin-walled corallites. Axial corallites if present: outer diameter 2.1-2.8 mm, inner diameter 0.9-1.3 mm, primary septa to 1/2R, secondary septa to 1/4R. Radial corallites: just touching and dimorphic in some parts of colony, being sub-immersed to exsert, the latter having nariform or slightly dimidiate openings, primary septa to 1/2 R, secondary cycle incomplete or absent, to 1/4 R. Coenosteum smoothly costate on radials, reticulate in between with simple spinules.

Known colors brown or bright green, sometimes pinkish.

Ecology

Found mostly in shallow reefs, especially in biotopes subjected to wave action and strong currents, also lagoons.

Occurrence

Southern Taiwan, Ludao, Lanyu, Dongsha Atoll, Taiping Island.

Distribution

Widely distributed throughout the Indo-Pacific, from the Maldives to Fiji.

Remarks

A. palmerae has corallites similar to those of *A. robusta*, *A. danai*, and *A. intermedia*, but it is distinguished from them by its encrusting growth form.

An encrusting colony of *Acropora palmerae* (Dongsha).

Corallites of *Acropora palmerae.*

Acropora subglabra (Brook, 1891)

Chinese Name 次生軸孔珊瑚
Family Acroporidae
Publication *Madrepora subglabra* Brook (1891)
Synonymy *Acropora subglabra* Nemenzo (1967); Wallace (1978); Veron & Wallace (1984); Veron (1986); Nishihira & Veron (1995); Wallace (1999); Veron (2000)
Acropora spiniformis Eguchi & Shirai (1977)

Taxonomic Description & Diagnosis

Colonies are hispidose, forming thickets composed of irregularly dividing, bottlebrush branches from which evenly-spaced, short branchlets are formed. Axial corallites: outer diameter 0.8-1.5 mm, inner diameter 0.3-0.8 mm, primary septa to 2/3R, secondary septa absent or just a few are visible. Radial corallites: scattered, not touching and uniform in sizes, appressed tubular with round, oval or slightly nariform openings, primary septa to 2/3R, secondary septa absent. Coenosteum on and between radials may be costate with moderately elaborated spinules or with spinules arranged in lines.

Known colors cream and pale brown, often with yellow branchlet tips.

Ecology

Occurs mostly in protected reef environments with clear water, such as sandy slopes and lagoon floors.

Occurrence

Lagoon of Dongsha Atoll.

Distribution

Widely distributed throughout the Indo-Pacific, from the Maldives to Fiji.

Remarks

A. subglabra is similar to *A. echinata*, but the former is distinguished by its smaller, contracted calices and solid corallite walls.

Colonies of *Acropora subglabra* (Dongsha).

Acropora subglabra colony on sandy bottom.

Anacropora forbesi Ridley, 1884

Chinese Name 福貝擬軸孔珊瑚
Family Acroporidae
Publication *Anacropora forbesi* Ridley (1884)
Synonymy *Anacropora forbesi* Yabe & Sugiyama (1941); Veron & Wallace (1984); Veron (1986); Nishihira & Veron (1995); Veron (2000)
Anacropora gracilis Wells (1954)
Anacropora reptans Wells (1954)

Taxonomic Description & Diagnosis

Colonies are arborescent, with slightly tapering branches and rounded, blunt tips. Branches usually divide dichotomously at regular intervals, and are less than 10 mm in diameter. They may be compacted in relatively shallow or clear water, or having a lax appearance. Corallites are regularly distributed, conical to immersed as the depth increases, and sometimes with a slightly protuberant lower lip. Calices are circular, 0.6-1.0 mm in diameter. Septa are better developed in deeper waters, arranged in two complete cycles, consisting of rows of straight spines. Primary septa <1/3R to 3/4R, and secondary septa may be absent or reduced, 1/3R to 1/2R. Coenosteum is covered with compacted, elaborated spinules which may give the coenosteum a frosted appearance or fuse into a solid structure.

Known colors pale brown with branch tips white.

Ecology

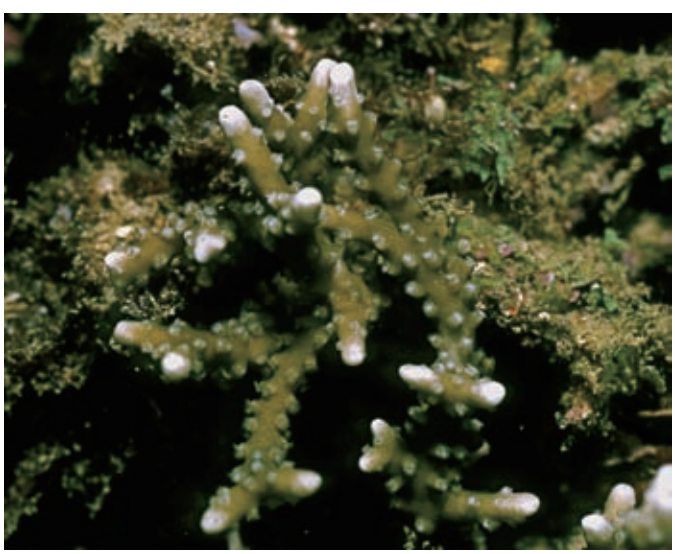
Occurs in shallow reef environment, especially where it is turbid and adjacent to sandy substrates. Also found on exposed upper reef slopes.

Occurrence

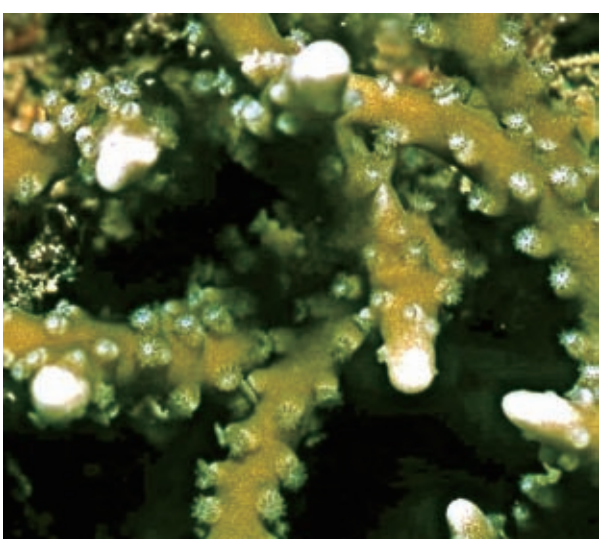
Only found in Nanwan Bay in southern Taiwan.

Distribution

Widely distributed throughout the Indo-Pacific.



A small colony of *Acropora forbesi.*



Corallites of *Acropora forbesi.*

Isopora cuneata (Dana, 1846)

Chinese Name 楔形同軸珊瑚
Family Acroporidae
Publication *Madrepora cuneata* Dana (1846)
Synonymy *Acropora plicata* Vaughan (1918); Chevalier (1968);
Acropora hispida Chevalier (1968)
Acropora cuneata Wells (1954); Veron & Wallace (1984); Veron (1986); Nishihira & Veron (1995); Wallace (1999); Veron (2000)
Acropora securis Nemenzo (1967)
Acropora reclinata Nemenzo (1967)

A cuneiform colony of *Isopora cuneata.*

Taxonomic Description & Diagnosis

Colonies are cuneiform to semi-encrusting, being solid plates with or without flattened, blade-like branches 15-150 mm across and up to 150 mm high, often forming extensive rounded clumps. Sometimes incipient branches may occur on the side of the blades. Axial corallites: multiple axials, if present, are on branch margins, outer diameter 1.5-3.1 mm, inner diameter 0.5-1.0 mm, primary septa to 2/3R, secondary septa to 1/3R. Radial corallites: may or may not be touching, uniform in sizes, outer diameter 1.5-2.0 mm, inner diameter 0.5-1.0 mm, conical or appressed, rounded tubular, primary septa to 1/3R, secondary septa to 1/4R. Coenosteum is covered with elaborated, meandroid spinules which are densely arranged.

Known colors cream and brown.

Ecology

Occurs in all reef environments, especially upper reef slopes and reef flats.

Occurrence

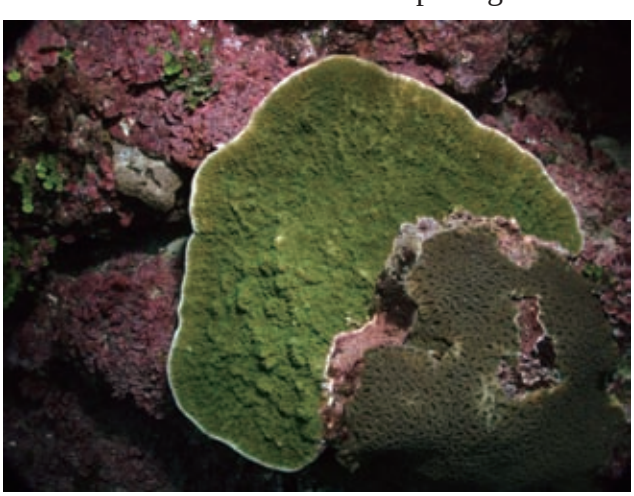
Southern Taiwan, Ludao, and Dongsha Atoll.

Distribution

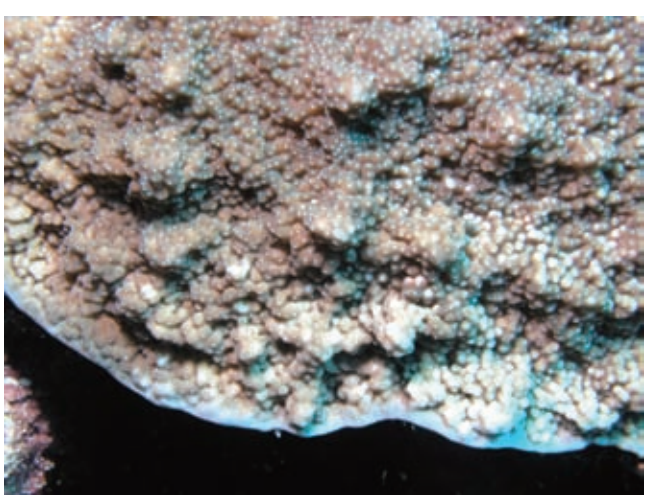
Widely distributed throughout the Indo-Pacific, from east Africa, to Fiji.

Remarks

A. cuneata is similar to *A. palifera*, but the latter is distinguished by its larger, appressed tubular radial corallites with dimidiate openings.



An encrusting colony of *Isopora cuneata* (Ludao).



Corallites of *Isopora cuneata.*

Isopora brueggemanni (Brook, 1893)

Chinese Name 鈍枝同孔珊瑚
Family Acroporidae
Publication *Madrepora brueggemanni* Brook (1893)
Synonymy *Acropora brueggemanni* (Brook); Crossland (1952); Nemenzo (1967); Wallace (1978); Veron & Wallace (1984); Veron (1986); Wallace & Dai (1997); Wallace (1999)
Specimen G35498 Nanwan

Taxonomic Description & Diagnosis

Arborescent branching, branches thick and radial corallites obvious. Arborescent branches have 1 or 2 axial corallites (sometimes more) with outer diameter 2.9-4.5 mm, inner diameter 1.0-1.6 mm; primary septa present up to 3/4 R, secondaries up to 1/3 R; radial corallites conical or tubular appressed with round openings; coenosteum a dense arrangement of horizontally elongated, elaborated spinules both on and between corallites.

Known colors brown, pale green, or white.

Ecology

Found on subtidal reef flats, reef edge, or upper slope.

Occurrence

Southern Taiwan, Ludao, Penghu Islands.

Distribution

Distributed throughout east Indian Ocean and the Pacific.

Remarks

This species is distributed throughout the central part of the Indo-Pacific, including the northern part of the Great Barrier Reef, but not in other parts of the Pacific, where it is replaced by another isoporan species, *I. cuneata*.

A branching colony of *Isopora bruggemanni*.

Axial and radial corallites.

Isopora palifera (Lamarck, 1816)

Chinese Name 籬枝同孔珊瑚
Family Acroporidae
Publication *Astrea palifera* Lamark (1816)
Synonymy *Acropora palifera* (Lamarck); Vaughan (1918); Crossland (1952); Scheer & Pillai (1974)
Acropora (Isopora) palifera (Lamarck); Veron & Wallace (1984); Wallace (1999)
Specimen MTQ: G45935, Ludao, Haisenping; G45938, Ludao, Nanliao; TUIO: C7293 -4, Ludao

Taxonomic Description & Diagnosis

Colonies have thick branches with multiple axial corallites opening along the tip of the branch; large radial corallites obvious, sometimes dimidiate openings can be seen. Branches are thick, cuneiform, with many axial corallites; axial corallites outer diameter 2.8 to 4.2 mm, inner diameter 0.7 to 1.4 mm, primary septa up to R, secondary septa up to 1/3 R; radial corallites large, 1.0 to 5.0 mm long, appressed tubular with distinct dimidiate openings; primary septa up to R, secondary septa up to 1/3 R; coenosteum a dense arrangement of horizontally elongated, elaborated spinules both on and between radial corallites.

Known colors brown or green.

Ecology

Found on deeper parts of reef flat, reef slopes and subtidally, sometimes occurs in an encrusting form on the reef edge.

Occurrence

All reef areas around Taiwan, but very rare in northern Taiwan.

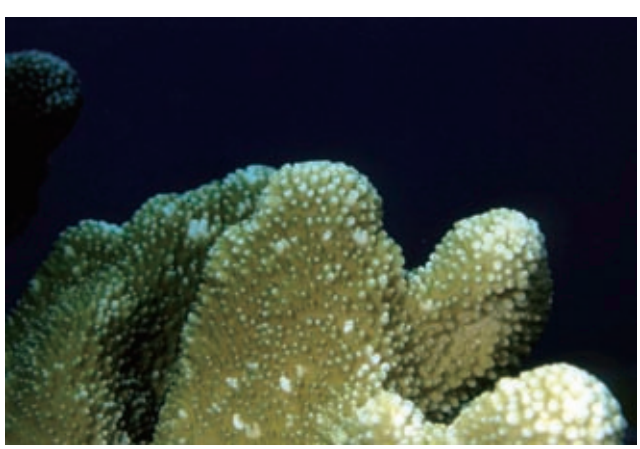
Distribution

Widely distributed throughout the Indo-Pacific.

Remarks

This is the most common isoporan species, occurring throughout the Indian and Pacific Oceans as well as the central Indo-Pacific. It is rare in southern Taiwan and more abundant in the offshore Pacific Ocean islands.

A colony of *Isopora palifera* with thick branches (Penghu).



Corallites of *Isopora palifera.*

Astreopora expansa Brüggemann, 1877

Chinese Name 板葉星孔珊瑚
Family Acroporidae
Publication *Astreopora expansa* Brüggemann (1877)
Synonymy *Astreopora explanata* Veron (1986); Nishihira & Veron (1995)
Astreopora expansa Veron (2000)

Taxonomic Description & Diagnosis

Colonies are foliaceous to laminar, usually forming thick, flat, bifacial plates that may be arranged in tiers or whorls. Corallites are evenly distributed, mostly inclined towards the colony margins, and often arranged in rows. Calices are circular to slightly elliptical, with a diameter of roughly 1.4-2.2 mm. Primary septa are short and weakly developed, with a straight margin descending abruptly in the calices centers. Coenosteum is covered with fine spinules which have elaborated tips, giving it a coarse, spongy appearance.

Living colonies are usually pink, dark green or brown, usually with pale margins.

Ecology

Usually found in shallow reef environments, especially protected biotopes or lagoons, and are uncommon but conspicuous.

Occurrence

Nanwan Bay, Penghu Islands, Dongsha Atoll.

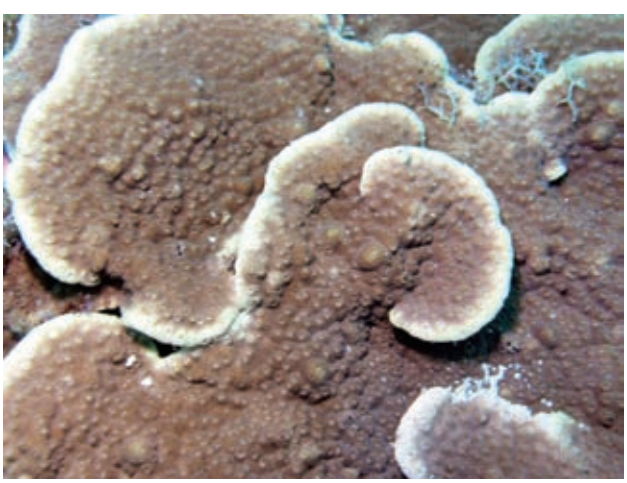
Distribution

Widely distributed throughout the Indo-Pacific, from the Persian Gulf to Fiji.

Remarks

This species resembles *Astreopora myriophthalma*, but the latter is rarely laminar.

A laminar colony of *Astreopora expansa* (Nanwan).



A close-up view of corallites.

Astreopora gracilis Bernard, 1896

Chinese Name 疣星孔珊瑚
Family Acroporidae
Publication *Astreopora gracilis* Bernard (1896)
Synonymy *Astreopora gracilis* Yabe & Sugiyama (1941); Veron & Wallace (1984); Veron (1986); Nishihira & Veron (1995); Veron (2000)
Astreopora tayami Yabe & Sugiyama (1941)

Taxonomic Description & Diagnosis

Colonies are submassive and hemispherical. Corallites are immersed to conical or tubular, irregularly dispersed, and usually facing different directions. Calices are circular with a diameter of 1.4-1.8 mm. Primary septa usually reach 1/2-3/4R deep within the corallites, and may develop dentations forming tangled, rudimentary columella. Secondary septa are short, and a few tertiary septa may occur at calices rims in some corallites. Coenosteum is covered with short, even, tightly compacted spinules with elaborated tips, giving it a uniform, smooth appearance.

Living colonies are usually pale cream or brown.

Ecology

Occurs in most reef environments, especially in shallow, turbid waters.

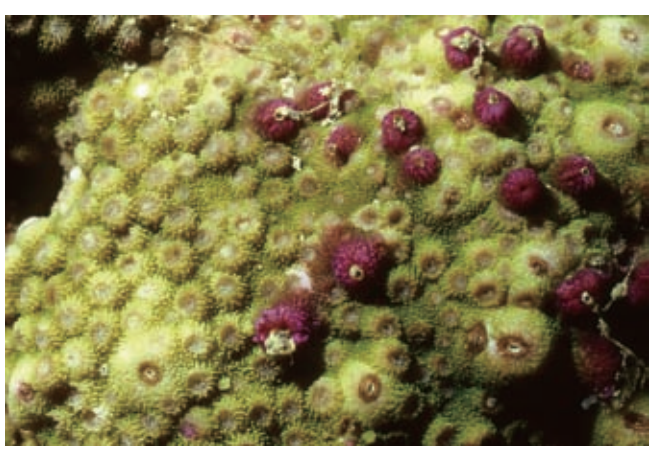
Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

Widely distributed throughout the Indo-Pacific, from the Red Sea to Fiji.

A submassive colony of *Astreopora gracilis* (Ludao).



Irregularly dispersed corallites.

Astreopora incrustans Bernard, 1896

Chinese Name 卷葉星孔珊瑚
Family Acroporidae
Publication *Astreopora incrustans* Bernard (1896)
Synonymy *Astreopora incrustans* Yabe, Sugiyama & Eguchi (1936); Nishihira & Veron (1995); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are encrusting to forming thick, flattened plates, sometimes forming irregular tubes and columns, and commonly over 1 m across. Corallites are evenly spaced, may be immersed to slightly conical, the latter usually inclined towards the colony periphery. Calices are circular; with a diameter of approximately 1 mm. Primary septa are thin or weakly developed, and rarely fused. Coenosteum is porous and covered with spinules which have elaborated tips, giving it a coarse, spongy appearance.

Living colonies are usually cream, green, brown or grey.

Ecology

Usually found in shallow reef environments, especially protected upper reef slopes.

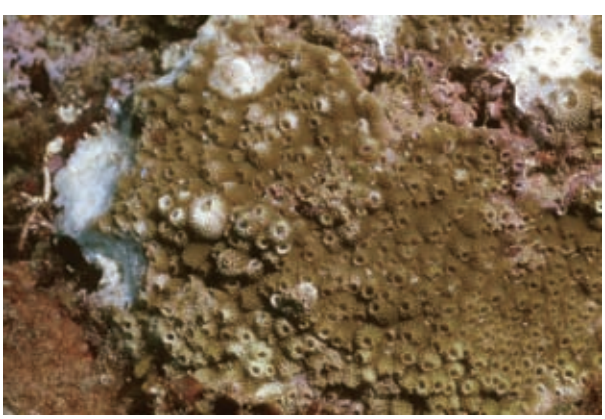
Occurrence

Nanwan Bay, Ludao, Penghu Islands, Dongsha Atoll.

Distribution

Restricted to the west Pacific, from Japan to the Great Barrier Reef.

A plate-like colony of *Astreopora incrustans* (Nanwan).



Corallites of *Astreopora incrustans*.

Astreopora listeri Bernard, 1896

Chinese Name 潛伏星孔珊瑚
Family Acroporidae
Publication *Astreopora listeri* Bernard (1896)
Synonymy *Astreopora listeri* Wells (1954); Scheer & Pillai (1974); Veron & Wallace (1984); Veron (1986); Nishihira & Veron (1995); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are massive, being hemispherical to flattened. Corallites are immersed, crowded, but evenly spaced. Calices are circular, with a diameter of 1.8-2.3 mm. Smaller, immersed corallites are often interspersed and intergraded with larger, conical ones. Primary septa usually have straight margins and taper from the calice rim to 3/4R deep within the corallites, where some may fuse; occasionally they may develop elongate dentations. Secondary septa are < 1/3R, and a few tertiary septa may occur in some colonies. Corallite rims are surrounded by elaborated spinules which are the ends of the corallite trabeculae, and are higher than coenosteum spinules. Coenosteum is covered with thick, elaborated spinules, giving it a coarse, hirsute appearance.

Living colonies are usually cream, brown or grey.

Ecology

Occurs in most reef environments, especially in shallow, turbid waters.

Occurrence

Southern Taiwan, eastern Taiwan, Xiaoliuchiu, Penghu Island, Dongsha Atoll, Ludao, and Lanyu.

Distribution

Widely distributed throughout the Indo-Pacific, from the Gulf of Aden to Samoa.

Remarks

Colonies from shallow waters under strong wave impacts have crowded corallites and fine, well developed skeletal structure. This species is similar to *A. myriophthalma*, but the latter is distinguished by the conical corallites and less spinulate coenosteum.

A massive colony of *Astreopora listeri*.

Corallites of *Astreopora listeri*.

Astreopora myriophthalma (Lamarck, 1816)

Chinese Name 蜂巢星孔珊瑚
Family Acroporidae
Publication *Astraea myriophthalma* Lamarck (1816)
Synonymy *Astreopora myriophthalma* Vaughan (1918); Yabe & Sugiyama (1941); Crossland (1952); Wells (1954); Nemenzo (1964); Veron & Wallace (1984); Veron (1986); Nishihira & Veron (1995); Veron (2000)
Astreopora stellae Nemenzo (1964)

Taxonomic Description & Diagnosis

Colonies are massive, being hemispherical to flattened, usually with an even surface. Corallites are conical and evenly spaced. Calices are circular, rarely elliptical, with a diameter of 1.8-2.8 mm. Smaller, immersed corallites are often interspersed and intergraded with larger, conical ones. Primary septa usually have smooth margins and reach 3/4R deep within the corallites, but occasionally may develop dentations that fuse at the corallite axis. Secondary septa are short, and tertiary septa are absent. Corallite rims are surrounded by projecting spinules which align down the trabeculae, resembling costae. Coenosteum is covered with short, elaborated spinules.

Living colonies are usually cream, brown or yellow, may be mottled sometimes.

Ecology

Occurs in most reef environments, except in turbid waters, and they are seldom abundant.

Occurrence

All reef areas around Taiwan and offshore islets.

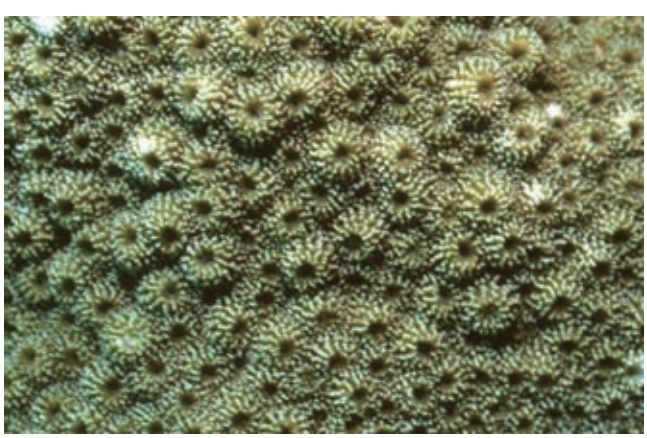
Distribution

Widely distributed throughout the Indo-Pacific, from the Red Sea to the French Polynesia.

Remarks

Colonies from upper reef slopes are more heavily calcified, with corallites of varying sizes and costate appearances. This species is similar to *Astreopora listeri*, but the latter is distinguished by the immersed corallites and coenosteum with hirsute appearance.

A hemispherical colony of *Astreopora myriophthalma* (Nanwan).



Corallites of *Astreopora myriophthalma*.

Astreopora ocellata Bernard, 1896

Chinese Name 圓目星孔珊瑚
Family Acroporidae
Publication *Astreopora ocellata* Bernard (1896)
Synonymy *Astreopora ocellata* Vaughan (1918); Yabe & Sugiyama (1941); Wells (1954); Veron & Wallace (1984); Veron (1986); Nishihira & Veron (1995); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are massive, flattened to dome-shaped. Corallites are compacted, and characterized by large, wide openings and thick walls. Small, immersed corallites are usually interspersed between the larger ones. Calices are circular, up to 3.8 mm in diameter. Primary septa usually taper from the calices rim to 3/4R deep within the corallites, where they often develop elongate dentations, that sometimes form tangled, rudimentary columella. Secondary septa are short, and a few tertiary septa may be distinguished. Coenosteum is covered with short, widely spaced spinules, giving it a coarse, spongy appearance.

Living colonies are usually cream or yellow.

Ecology

Usually found in shallow reef environments, especially upper reef slopes exposed to strong wave action.

Occurrence

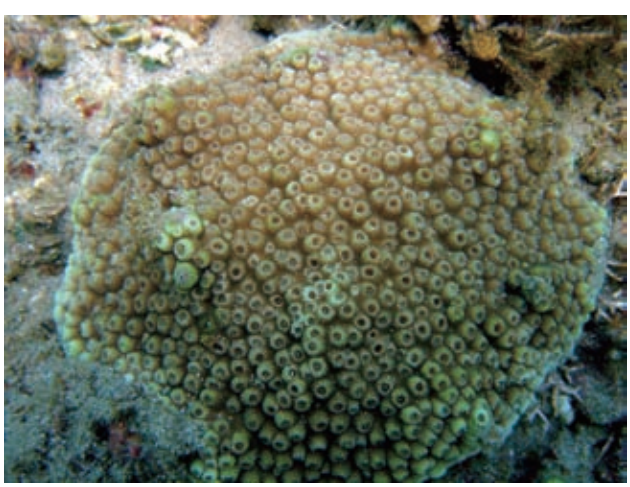
Southern Taiwan, Xiaoliuchiu, Penghu Islands, Ludao, Lanyu, Dongsha Atoll.

Distribution

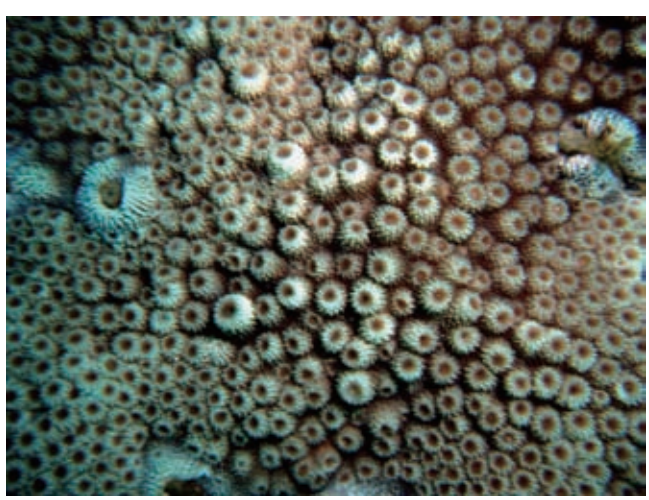
Widely distributed throughout the Indo-Pacific, from the Mozambique Channel to Marshall Islands and Fiji.

Remarks

This species is easily distinguished by their large corallites and better-developed septation. However, it should be noted that some colonies have lobes of small, immersed corallites, which have little resemblance in skeletal characters to the original colony, and may be mistaken as another species.



A dome-shaped colony of *Astreopora ocellata*.



Corallites of *Astreopora ocellata*.

Astreopora randalli Lamberts, 1980

Chinese Name 藍德爾星孔珊瑚
Family Acroporidae
Publication *Astreopora randalli* Lamberts (1980)
Synonymy *Astreopora randalli* Randall & Myers (1983); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are encrusting to laminar, often forming flat plates. Corallites are small, crowded and mostly immersed, except for some that are slightly conical. Corallites are up to 1.5 mm in diameter, with circular openings, bearing 6-12 septa. Corallite rims are surrounded by projecting spinules which align down the sides of corallites, resembling costae. Columella is absent. Coenosteum is covered with elaborated spinules, giving it a coarse appearance.

Living colonies are usually cream, green, brown or grey.

Ecology

Occurs in shallow protected reef environments, and is usually uncommon.

Occurrence

Southern Taiwan, Ludao, Penghu Islands, Dongsha Atoll.

Distribution

Widely distributed throughout the Pacific.

Remarks

This species resembles *Astreopora listeri*, but the latter is distinguished by their larger calices and more widely spaced corallites.

A plate-like colony of *Astreopora randalli* (Dongsha).

Corallites of *Astreopora randalli.*

Alveopora spongiosa Dana, 1846

Chinese Name 海綿汽孔珊瑚
Family Acroporidae
Publication *Alveopora spongiosa* Dana (1846)
Synonymy *Alveopora spongiosa* Veron & Pichon (1982); Veron (1986); Nishihira & Veron (1995); Veron (2000)

An encrusting plate colony of *Alveopora spongiosa*.

Taxonomic Description & Diagnosis

Colonies are thick encrusting plates or small nodules that are irregular or hemispherical. Corallites are sub-polygonal to circular, 1.9-2.6 mm in diameter, with perforate walls composed of trabecular pillars and synapticular linkages, resulting in 40-80 percent of the surface area being porous. Septa may be in two orders of length 0.5-1.0 times the calices diameter; or reduced to only a few irregular, tapering spines. No columella is developed.

Living colonies have polyps up to 3 cm long, with 12 tentacles that are extended during the day. The tentacles are brown, white, bright blue or green. Rarely, six large tentacles may alternate with six smaller ones. They are usually uniformly dark or pale brown in color, but may be dark green or purple when exposed to strong illumination, and being cream when in shaded biotopes.

Ecology

Usually found in protected upper reef slopes.

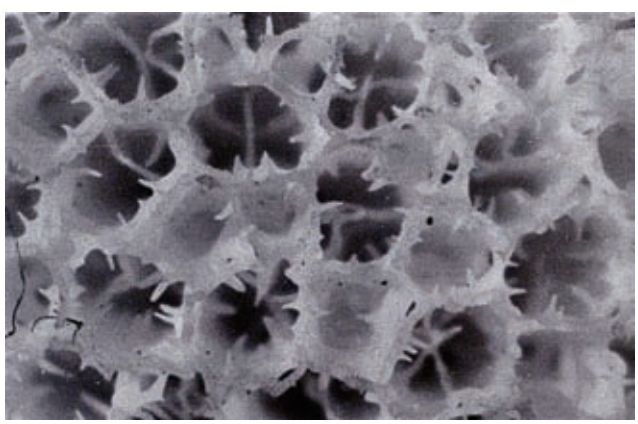
Occurrence

Nanwan Bay, Ludao, Lanyu

Distribution

Widely distributed throughout the Indo-Pacific, from the Red Sea along east Africa, to Marshall Islands and Samoa.

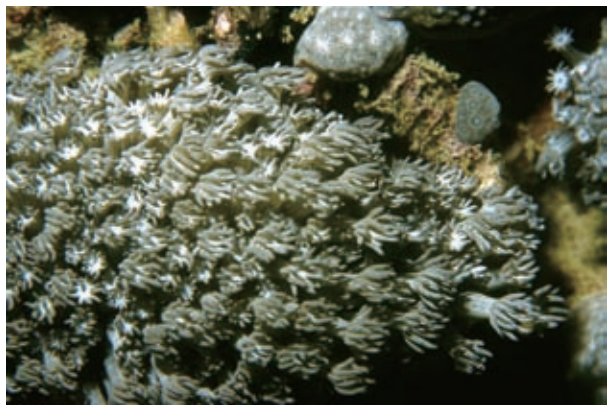
Polyps of *Alveopora spongiosa*.



Corallites of *Alveopora spongiosa*. (x 6)

Alveopora fenestrata (Lamarck, 1816)

Chinese Name 窗形汽孔珊瑚
Family Acroporidae
Publication *Pocillopora fenestrata* Lamarck (1816)
Synonymy *Alveopora fenestrata* Veron & Pichon (1982); Veron (1986); Veron (2000)



Taxonomic Description & Diagnosis

Colonies are massive and hemispherical, usually with nodular or lobed surfaces. Corallites are hexagonal, 2.1-3.0 mm in diameter, with thin, perforate walls composed of trabecular pillars and synapticular linkages, resulting in 30-50 percent of the surface area being porous. Septa are in two indistinct orders, with the first order being six vertical rows of spines which becomes progressively fine and longer the deeper they are located in the calices. They may fuse deep inside the calices, with tips slightly elaborated, but no columella is developed.

Living colonies have long, ragged-looking polyps with 12 long, thin tentacles that are extended during the day. They are usually uniform green or dark brown in color, sometimes oral cones are white.

Ecology

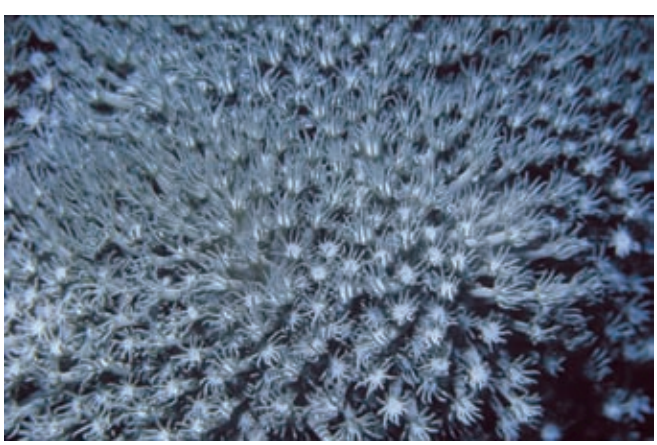
Found in shallow reef environments.

Occurrence

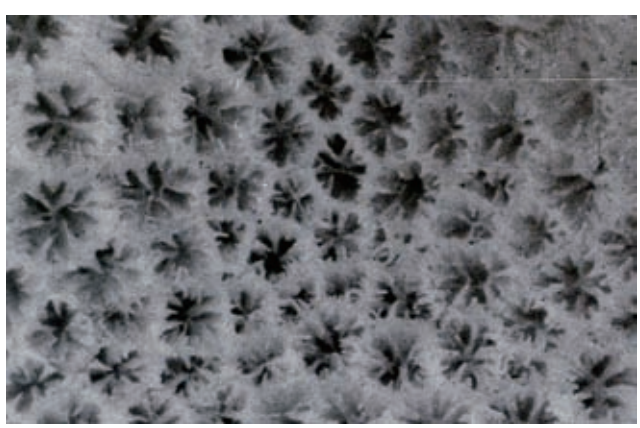
Nanwan Bay in Southern Taiwan, Ludao, Lanyu

Distribution

Widely distributed throughout the Indo-Pacific, from east Africa, to Marshall Islands and Fiji.



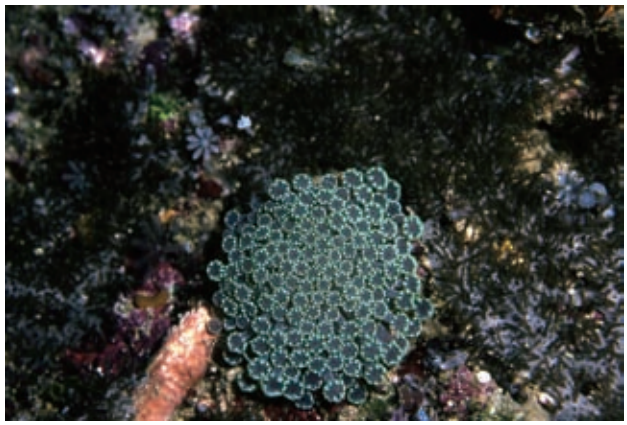
Polyps of *Alveopora fenestrata* (Nanwan).



Corallites of *Alveopora fenestrata.* (x 2.5)

Alveopora japonica Eguchi, 1968

Chinese Name 日本汽孔珊瑚
Family Acroporidae
Publication *Alveopora japonica* Eguchi (1968)
Synonymy *Alveopora japonica* Nishihira & Veron (1995); Veron (2000)



A small colony with short polyps.

Taxonomic Description & Diagnosis

Colonies are hemispherical to encrusting, usually small and less than 40 mm in diameter. Corallites are polygonal, with calices roughly 2.0-2.8 mm in diameter, with walls composed of regular lattice-like pores formed by trabecular pillars and horizontal synapticulae. Septa are in irregular comb rows, reduced to long and short, fine spines which seldom connect.

Living colonies have short polyps, uniform in length, with 12 knob-like tentacles that are extended during the day. They are usually dark green, with white stripes on the top of tentacle tips.

Ecology

Found in shallow rocky foreshores, usually nested among algae and soft corals.

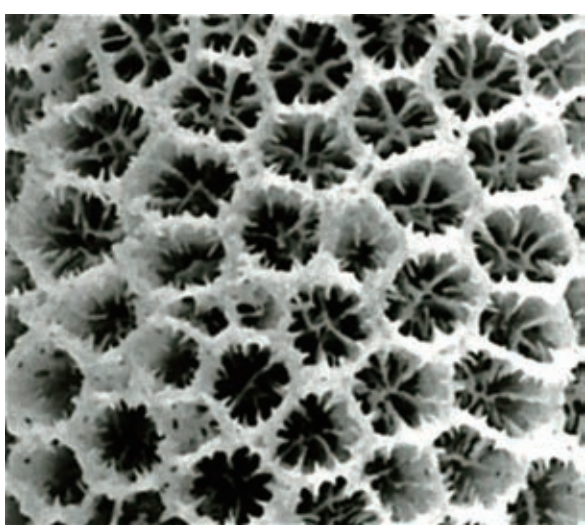
Occurrence

Ludao, Kenting, Lanyu, Penghu Islands.

Distribution

This rare species has only been recorded from Taiwan and Japan.

A hemispherical colony of *Alveopora japonica* (Ludao).



Corallites of *Alveopora japonica.* (x 4)

Alveopora tizardi Bassett-Smith, 1890

Chinese Name 平滑汽孔珊瑚
Family Acroporidae
Publication *Alveopora tizardi* Bassett-Smith (1890)
Synonymy *Alveopora tizardi* Veron & Pichon (1982); Veron (1986); Nishihira & Veron (1995); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are flat, sub-massive, or undulating plates. Corallites are polygonal, 1.2-1.7 mm in diameter, with perforate walls composed of trabecular and synapticular rods. The walls appear irregular from the surface, but in longitudinal section, the network formed by trabecular and synapticular rods are arranged in regular vertical and horizontal components surrounding circular pores. Septa may be in two orders, first order 3/4R in length, with rows of straight spines; second order is short and incomplete, < 1/4R in length. No columella is developed.

Living colonies have short polyps, uniform in length, with 12 knob-like tentacles that are extended during the day. They are usually pale pinkish-brown to bright pink, sometimes with grey oral cones and white tentacle tips.

Ecology

Usually found in shallow reef environments.

Occurrence

Most reef habitats in Taiwan except northern and northeastern Taiwan.

Distribution

Widely distributed throughout the Indo-Pacific, from the Red Sea along east Africa to Marshall Islands and Fiji.

A submassive colony of *Alveopora tizardi* (Ludao).

Polyps of *Alveopora tizardi* with knob-like tentacles.

Family Poritidae Gray, 1842

There are three extant genera in Family Poritidae, *Porites, Goniopora* and *Stylaraea*. All are common throughout the Indo-Pacific, except for *Stylaraea* which is very rare, and have not been discovered in Taiwan. The genus *Alveopora* was originally included in Poritidae, but recent molecular analyses indicated that *Alveopora* is more closely related to other species of Acroporidae, thus it is now under the Family Acroporidae.

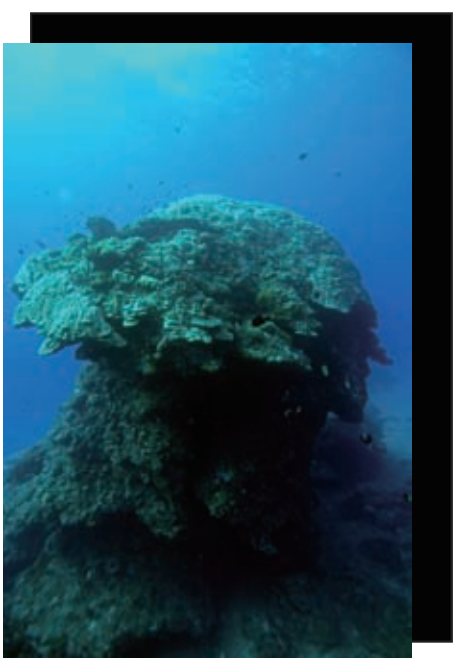
All Poritidae species are colonial, usually massive, some encrusting, laminar or ramose. Species of the genus *Porites* can attain very large sizes, from several meters to over 10 m in diameter, resembling a small seamount, and the age may reach thousands years old. A very large *Porites* colony with an estimated age of 1200 years was reported from Ludao (Green Island) off southeastern Taiwan (Soong et al. 1999). Colonies are primarily formed by extratentacular budding. Corallites are of a wide range of sizes among genera, but are closely compacted, with no or little coenosteum. Corallite walls are porous, composed of clearly differentiated synapticulae and trabeculae. Corallites of *Porites* species are very small, with inconspicuous skeletal characteristics that may only be distinguished under the microscope. In the contrary, *Goniopora* species are easily recognized by their large and fleshy polyps, each with 24 tentacles, which usually extend only in the day and are mostly brightly colored. Though *Porites* and *Goniopora* appear very different, they are related by the patterns of septal fusion, whereas septa are formed from trabeculae, the inner of which may be differentiated as pali.

Poritidae species are common in all types of reef habitats. They are more abundant in turbid or polluted reefs due to their high resistance to environmental stress. Thus they are often regarded as being stress-tolerant. When a coral reef is dominated by Poritidae species, it indicates the reef may be under environmental stress and that ecological functions may be compromised.

Simplified key to genera of Poritidae

Colonies with large, fleshy polyps..... *Goniopora*
Colonies without large, fleshy polyps ..... *Porites*

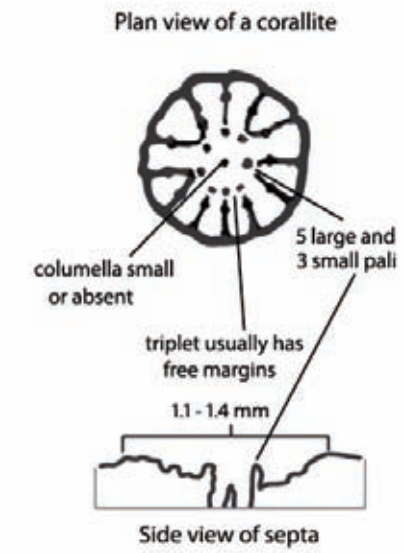
Goniopora colonies with fleshy polyps extending.



A very large *Porites* colony at Ludao.

Porites annae Crossland, 1952

Chinese Name 疣微孔珊瑚
Family Poritidae
Publication *Porites annae* Crossland (1952)
Synonymy *Porites annae* Veron & Pichon (1982); Veron (1986); Nishihira & Veron (1995); Veron (2000)



Taxonomic Description & Diagnosis

Colonies are branching, with horizontal plates. Branches are usually irregular and less than 20 cm in length. Calices are of 1.1-1.4 mm in diameter. Septal configurations are variable; it is seen even on the corallites of the same colony. Some corallites have triplets with free margins, with each septum having a small palus. In this case, there are five large and three small pali. Others may have fused triplet with one palus only. One to two denticles are present on each septum. Columella is short or absent.

Living colonies display a wide variety of colors, may be irregular or uniform green, yellow, purple or brown, either dark or pale.

Ecology

Usually found on reef slopes, may be either in clear or turbid waters.

Occurrence

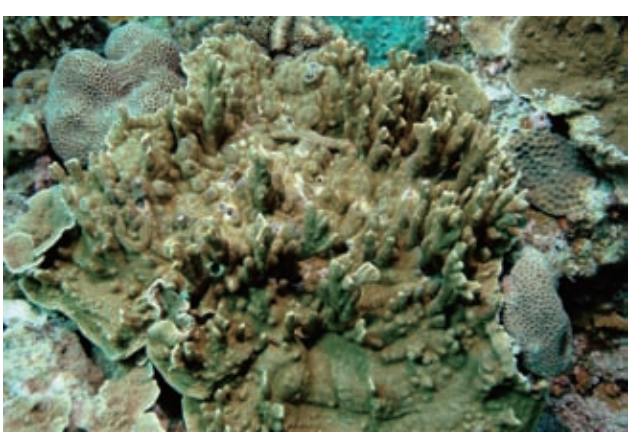
All reef areas in Taiwan except northern and northeastern coasts.

Distribution

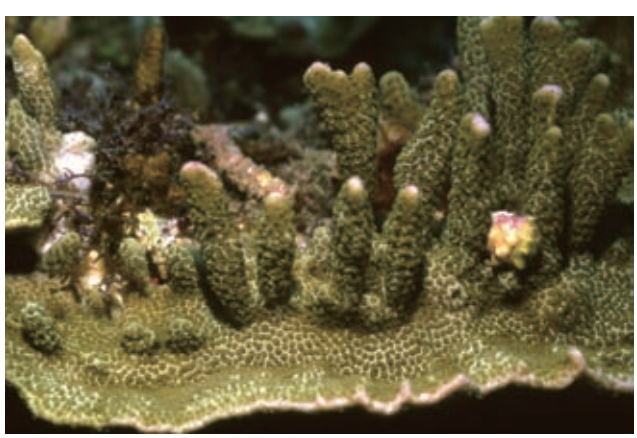
Distributed throughout the Indo-Pacific, from Sri Lanka to Marshall Islands and Fiji.

Remarks

Colonies from shallow water protected from strong wave action, with good illumination, usually consist of short, anastomosing branches. Colonies from turbid biotopes are mostly plate-like, with few branches.



A branching colony of *Porites annae* with horizontal plate.



A close-up view of branches and corallites.

Porites australiensis Vaughan, 1918

Chinese Name 澳洲微孔珊瑚
Family Poritidae
Publication *Porites australiensis* Vaughan (1918)
Synonymy *Porites australiensis* Yabe & Sugiyama (1935); Eguchi (1938); Crossland (1952); Wells (1954); Nemenzo (1955); Chevalier (1968); Veron & Pichon (1982); Veron (1986); Nishihira & Veron (1995); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are massive, hemispherical or helmet-shaped, usually with smooth surface, sometimes hillocky or nodular. Large colonies may reach several meters in height and diameter, and develop thick ledges or series of thick ledges around their base. Corallites are cerioid, with thick walls bearing three rows of denticles on their upper surface. Calices are 1.1-1.5 mm in diameter. Septa are variable in width, with the two lateral ones being smaller than the ventral directive. Ventral triplets usually have free margins. Septa of the lateral pairs and directive septa usually bear two denticles, whereas only one occurs on the lateral septa of the triplet. Eight pali which are generally higher than the septal denticles are present. Columella is present

Living colonies are usually cream or yellow, but in shallow waters, they may be brightly colored.

Ecology

Found in most reef environments, frequently a dominant species of back reef margins, lagoons, and some fringing reefs.

Occurrence

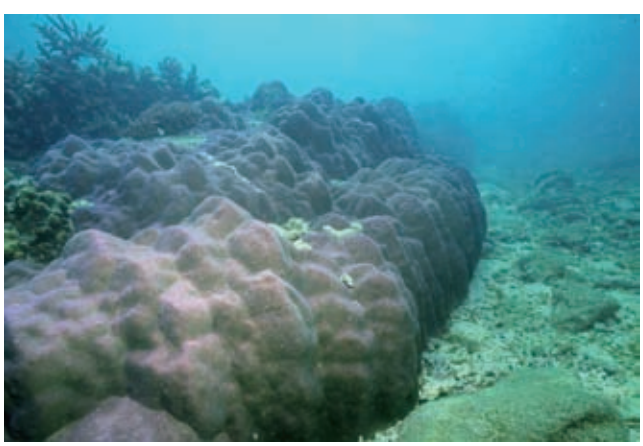
All reef areas in Taiwan.

Distribution

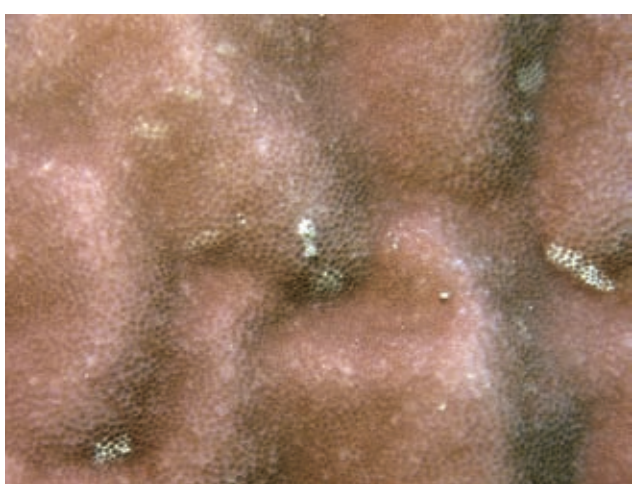
Widely distributed throughout the Indo-Pacific, from the Maldives to French Polynesia and east Pacific.

Remarks

This species is similar to *Porites lobata*, but the former is distinguished by its much taller pali.



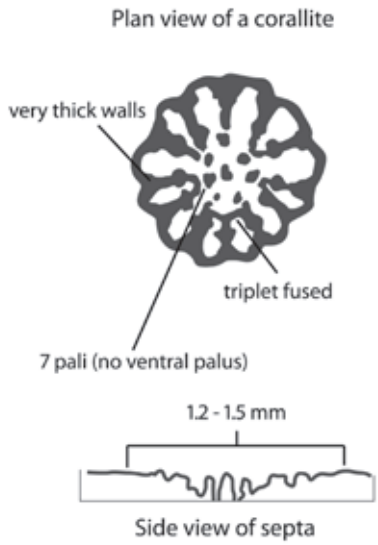
A large massive colony of *Porites australiensis* (Penghu).



Corallites of *Porites australiensis.*

Porites cylindrica Dana, 1846

Chinese Name 柱形微孔珊瑚
Family Poritidae
Publication *Porites cylindrica* Dana (1846)
Synonymy *Porites cylindrica* Bernard (1905); Vaughan (1918); Eguchi (1938); Chevalier (1968); Veron & Pichon (1982); Veron (1986); Nishihira & Veron (1995); Veron (2000)
Porites levis Bernard (1905)
Porites capricornis Eguchi (1938)
Porites andrewsi Vaughan (1918); Yabe & Sugiyama (1935); Eguchi (1938); Crossland (1952); Utinomi (1971); Zou (1975)



Taxonomic Description & Diagnosis

Colonies are branching, with branches usually < 30 cm in length, and < 40 mm in diameter near their base; sometimes the base may be encrusting or massive. Colonies may be over 10 m across, appearing lax and open with thick branches dividing at right angles, or compact and bushy with short branches dividing at acute angles. Branches are generally cylindrical, tapering towards a tip that may be blunt, conical or flattened. Corallites are very superficial, with indistinct walls, and calices are up to 1.5 mm in diameter. The distance between corallites are up to 7 calice diameters max. Septa are thick and long, extending almost to the corallites centers. Ventral triplets are fused. Pali are well developed. Septa all bear two denticles between the pali and the walls. Columella is distinct, almost as tall as the pali.

Living colonies display a variety of colors, with yellow, blue, and green being the most common.

Ecology

Found in many reef environments, frequently a dominant species of back reef margins and lagoons.

Occurrence

All reef areas in Taiwan except northern and northeastern coasts.

Distribution

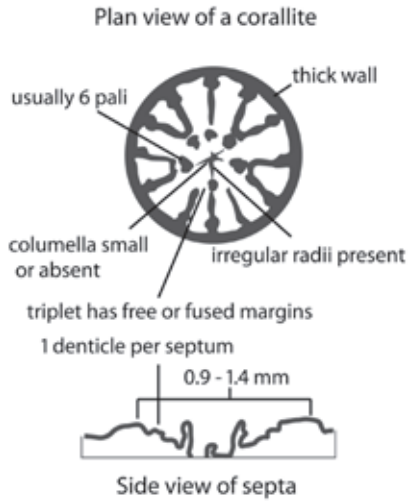
Widely distributed throughout the Indo-Pacific, from east Africa, to Marshall Islands and Samoa.


A branching colony of *Porites cylindrica* (Ludao).


Branches of *Porites cylindrica*.

Porites lichen Dana, 1846

Chinese Name 地衣微孔珊瑚
Family Poritidae
Publication *Porites lichen* Dana (1846)
Synonymy *Porites lichen* Bernard (1905); Vaughan (1918); Yabe & Sugiyama (1935); Wells (1954); Eguchi (1968); Veron & Pichon (1982); Veron (1986); Nishihira & Veron (1995); Veron (2000)
Porites reticulosa Bernard (1905); Chevalier (1968)
Porites viridis Bernard (1905); Vaughan (1918); Eguchi (1938)
Porites purpurea Bernard (1905); Yabe & Sugiyama (1935)



Taxonomic Description & Diagnosis

Colonies display a wide variety of growth forms, may be encrusting, thin lamina, thick plates, or sub-massive with nodules or branches. Corallites are usually aligned in rows, within which they are only separated by thin, low walls. Each row is then separated from another by higher, thick walls, resulting in a smooth colony surface. Calices are of 0.9-1.4 mm in diameter. Ventral triplets may be fused or have free margins. Most colonies have six pali, two on the directives and four on the lateral pairs; but sometimes up to eight pali is present. Septa usually bear one denticle near the corallite wall. Columella may be small or absent.

Living colonies are from yellowish-green to brown.

Ecology

Found in most reef environments, frequently a dominant species of lagoons and reef slopes.

Occurrence

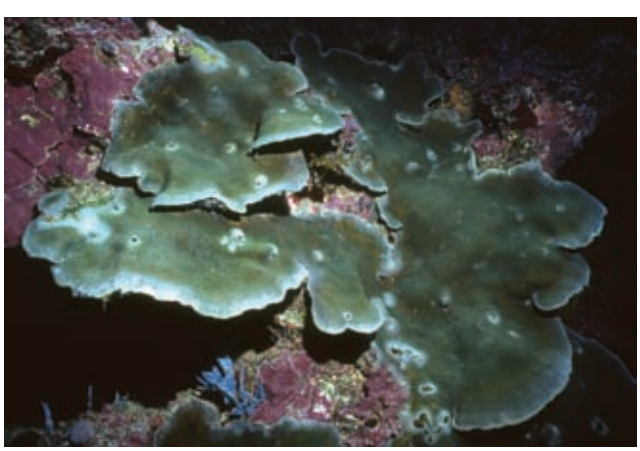
All reef areas in Taiwan.

Distribution

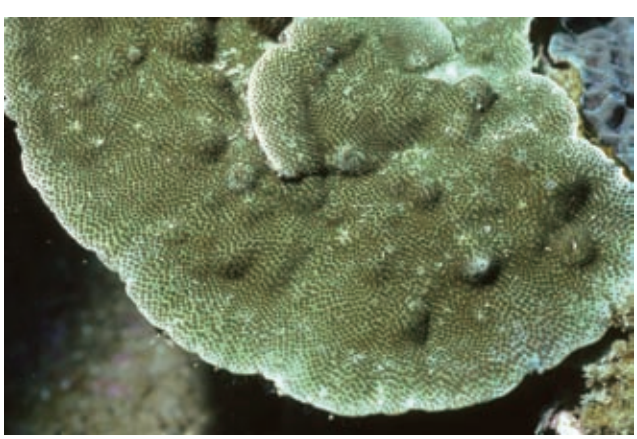
Widely distributed throughout the Indo-Pacific, from the Red Sea and east Africa to east Pacific.

Remarks

This species is similar to *P. annae*, but the former has smooth surfaces with superficial corallites.



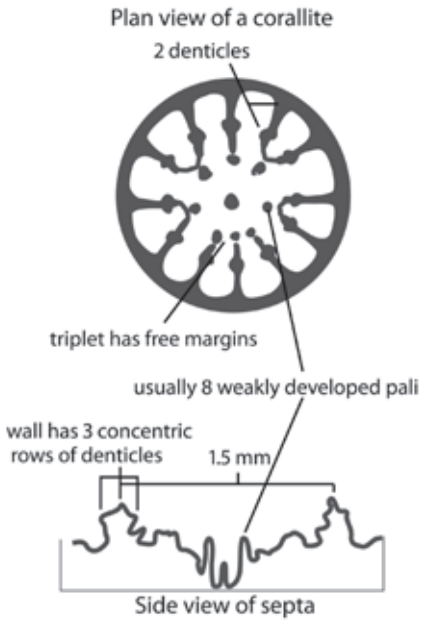
An encrusting colony of *Porites lichen* with laminar extensions.



Corallites of *Porites lichen*.

Porites lobata Dana, 1846

Chinese Name 團塊微孔珊瑚
Family Poritidae
Publication *Porites lobata* Dana (1846)
Synonymy *Porites lobata* Vaughan (1918); Yabe & Sugiyama (1935); Crossland (1952); Ma (1959); Scheer & Pillai (1974); Veron & Pichon (1982); Veron (1986); Nishihira & Veron (1995); Veron (2000)



Taxonomic Description & Diagnosis

Colonies are massive, hemispherical or helmet-shaped, usually with smooth surface, sometimes hillocky or columnar. Large colonies may reach several meters in height and diameter, and develop thick ledges or series of thick ledges around their base. Corallites are cerioid, with walls less than 1 mm in thickness, bearing three rows of denticles on their upper surface. Calices average 1.5 mm in diameter. The dorsal directive septum and the lateral pairs are well developed, and the triplets usually have free margins. Eight weakly developed pali are usually present. Each septum usually bears two denticles between the pali and the wall. Columella is in the form of an inconspicuous vertical or laterally compressed rod.

Living colonies are uniform in color, usually cream or pale brown, but in shallow waters, they may be bright blue, green or purple.

Ecology

Found in most reef environments, frequently a dominant species of back reef margins, lagoons, and some fringing reefs.

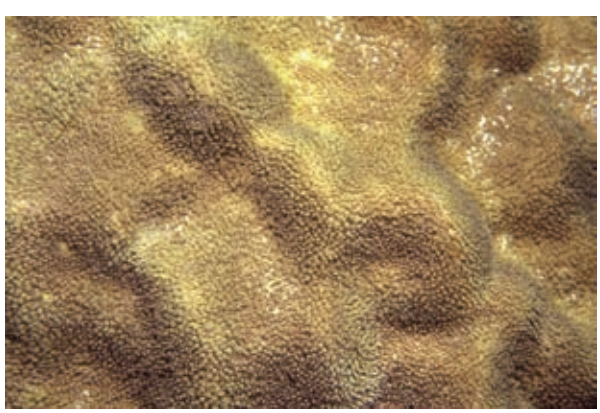
Occurrence

All reef areas in Taiwan.

Distribution

Widely distributed throughout the Indo-Pacific, from the Red Sea and east Africa to French Polynesia and east Pacific.

A large helmet-shaped colony of *Porites lobata* (Ludao).

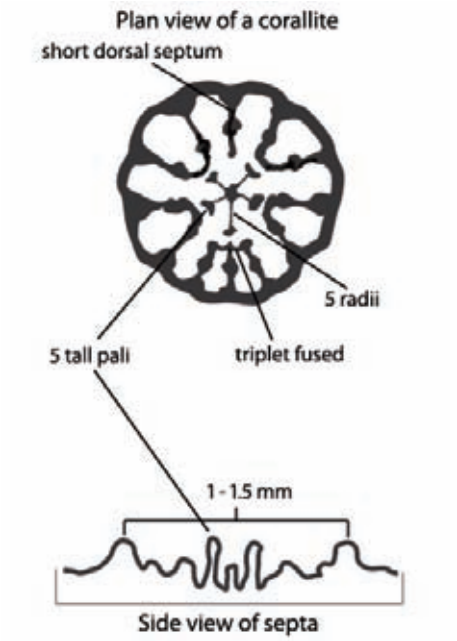


A close-up view of polyps and corallites.

Porites lutea Edwards & Haime, 1860

Chinese Name 鐘形微孔珊瑚
Family Poritidae
Publication *Porites lutea* Edwards & Haime (1860)
Synonymy *Porites lutea* Vaughan (1918); Yabe & Sugiyama (1935); Eguchi (1938); Wells (1954); Nemenzo (1955); Chevalier (1968); Scheer & Pillai (1974); Veron & Pichon (1982); Veron (1986); Nishihira & Veron (1995); Veron (2000)

Porites haddoni Vaughan (1918); Yabe & Sugiyama (1935); Crossland (1952)



Taxonomic Description & Diagnosis

Colonies are massive, usually with smooth surface, sometimes hillocky or columnar; rarely thin and encrusting. Large colonies may reach several meters in height and diameter, and develop series of thick ledges around their base. Corallites are cerioid and shallow, with thin walls, and calices are of 1.0-1.5 mm in diameter. Septa of the lateral pairs are usually longer than the dorsal directive. Ventral triplets are fused. Pali are well developed, usually reaching the height of the walls, with those on the lateral pairs usually being the largest. Columella is well formed, joined to the septa by five radii.

Living colonies are usually cream or yellow, but may be brightly colored in shallow waters.

Ecology

Found in most reef environments, frequently a dominant species of back reef margins, lagoons, and some fringing reefs.

Occurrence

All reef areas in Taiwan

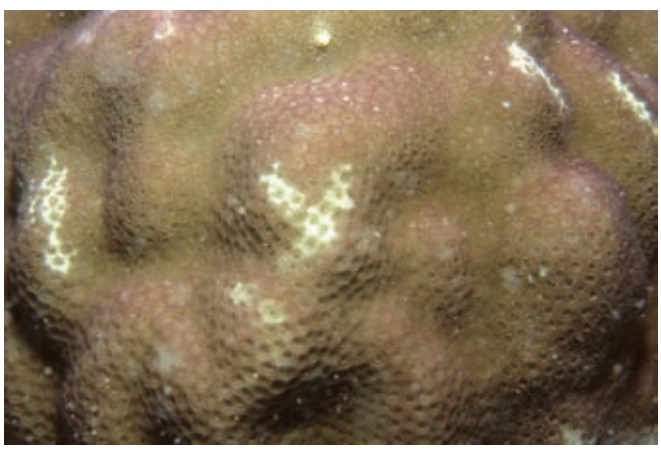
Distribution

Widely distributed throughout the Indo-Pacific, from the Red Sea and east Africa to French Polynesia and east Pacific.

Remarks

This species is similar to *Porites australiensis*, but the former is distinguished by its fused triplets.

A massive colony of *Porites lutea*.



Corallites of *Porites lutea*.

Porites murrayensis Vaughan, 1918

Chinese Name 莫氏微孔珊瑚
Family Poritidae
Publication *Porites murrayensis* Vaughan (1918)
Synonymy *Porites murrayensis* Yabe & Sugiyama (1935); Chevalier (1968); Scheer & Pillai (1974); Veron & Pichon (1982); Veron (1986); Nishihira & Veron (1995); Veron (2000)
Porites brighami Vaughan; Nemenzo (1955)

Taxonomic Description & Diagnosis

Colonies are massive, spherical or hemispherical, usually with a diameter of less than 20 cm. Corallites are cerioid, with walls of variable thickness, from being thin to half the corallite diameter, and calices are 0.8-1.0 mm in diameter. Septa are short, reaching 1/2 R, thus giving the deep corallites an appearance of a central fossa. Septa of the lateral pairs are slightly longer than those of the ventral triplets, which has free margins. Pali are indistinct or absent on dorsal directive septa and the ventral triplets, but are well formed on the lateral pairs. Columella is absent of irregularly developed, however, inconspicuous and deep within the center of the calices.

Living colonies are usually cream or brown, but may be brightly colored in shallow waters.

Ecology

Usually found in shallow reef environments, especially reef flats with clear water.

Occurrence

Southern Taiwan, Ludao, Lanyu, Penghu Islands

Distribution

Widely distributed throughout the Indo-Pacific, from the Maldives to Okinawa and French Polynesia.

Remarks

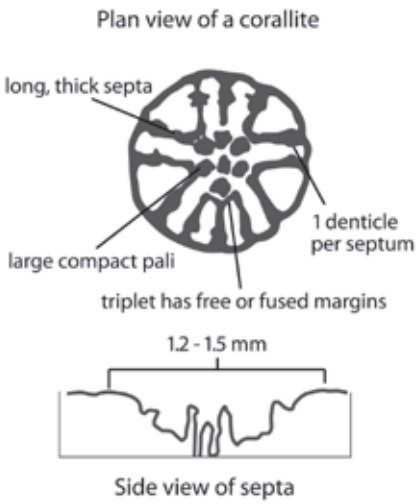
This species is similar to *Porites lobata*, but the former has shorter septa and deeper calices.

A massive colony of *Porites murrayensis* (Penghu).

A hemispherical colony of *Porites murrayensis* (Dongsha).

Porites nigrescens Dana, 1848

Chinese Name 歧枝微孔珊瑚
Family Poritidae
Publication *Porites nigrescens* Dana (1848)
Synonymy *Porites nigrescens* Bernard (1905); Vaughan (1918); Yabe & Sugiyama (1935); Eguchi (1938); Nemenzo (1955); Ma (1959); Zou (1975); Veron & Pichon (1982); Veron (1986); Nishihira & Veron (1995); Veron (2000)
Porites saccharata Bernard (1905)
Porites suppressa Crossland (1952); Scheer & Pillai (1974)



Taxonomic Description & Diagnosis

Colonies are branching, sometimes the base may be encrusting or planar, and branches are usually < 25 mm in diameter near their base. Colonies usually appear compact and straight with branches dividing at acute angles, but may also appear lax and open with branches dividing at large angles. Branches are cylindrical or slightly compressed laterally, tapering towards a tip that is usually acute. Corallites are polygonal, slightly excavated, with thin walls and calices are up to 1.5 mm in diameter. The distances between corallites are usually less than 1.5 calice diameter. Septa are thick and long, extending almost to the corallites centers. Ventral triplets are usually free but may be fused occasionally. Pali are thick and conspicuous. Septa have only one denticle near the walls. Columella is irregularly developed.

Living colonies are usually cream or brown.

Ecology

Found in many reef environments, most often in areas protected from strong wave action.

Occurrence

Hengchun Peninsula, Xiaoliuchiu, Ludao, Lanyu.

Distribution

Widely distributed throughout the Indo-Pacific, from the Red Sea and east Africa to Samoa.

Remarks

This species is similar to *P. cylindrica*, but the former has more compacted and deeper corallites and only one denticle per septa.


A branching colony of *Porites nigrescens* (Nanwan).


Branches of *Porites nigrescens.*

Porites okinawensis Veron, 1990

Chinese Name 沖繩微孔珊瑚
Family Poritidae
Publication *Porites okinawensis* Veron (1990)
Synonymy *Porites okinawensis* Veron (2000)

Taxonomic Description & Diagnosis

Colonies are encrusting to massive, usually with irregular surface. Corallites are cerioid, superficial and angular, with calices of 1.2-1.7 mm in diameter. Septa are thick and wedge shaped, each bearing two denticles. Ventral triplets are fused. Pali are weakly developed or absent. Columella is small or absent, joined to the septa by five highly fused radii. The coenosteum between corallites is highly granulated, resulting in a rough surface of the colony which can be observed underwater.

Living colonies are usually cream or pale brown, but may be bright green in high latitudes.

Ecology

Mostly found in semi-protected shallow reef environments or terrigenous rock substrates.

Occurrence

Penghu Islands and northeastern Taiwan

Distribution

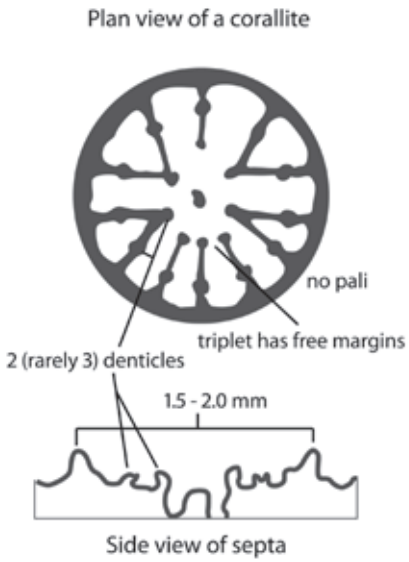
Distributed only from Taiwan, Okinawa, and Japan.

A massive colony of *Porites okinawaensis* (Penghu).

Corallites of *Porites okinawaensis.*

Porites solida (Forskål, 1775)

Chinese Name 堅實微孔珊瑚
Family Poritidae
Publication *Madrepora solida* Forskål (1775)
Synonymy *Porites solida* (Forskål); Vaughan (1918); Crossland (1952); Scheer & Pillai (1974); Veron & Pichon (1982); Veron (1986); Nishihira & Veron (1995); Veron (2000)



Taxonomic Description & Diagnosis

Colonies are massive and hemispherical, with even or undulating surface, and may reach several meters in diameter. Corallites are cerioid, thin walled with roughly 24 denticles on them, and calices are of 1.5-2.0 mm in diameter. Septa are usually wedge-shaped, not reaching the upper wall margin, with two to three hirsute-shaped denticles which decrease in height towards the center. No palus is formed, but the inner denticle resembling a poorly developed palus may be mistaken. The lateral pairs of the triplet are usually longer than the dorsal directive septum and the lateral septa. Columella is present.

Living colonies are usually brown or greenish-yellow.

Ecology

Found in most reef environments, especially in shallow reef biotopes.

Occurrence

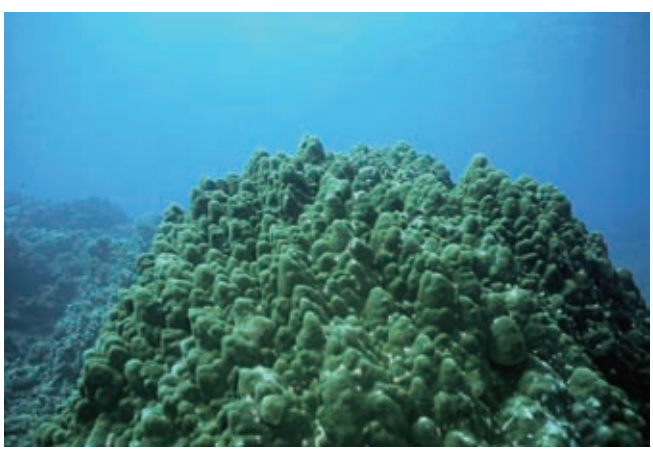
All reef areas in Taiwan.

Distribution

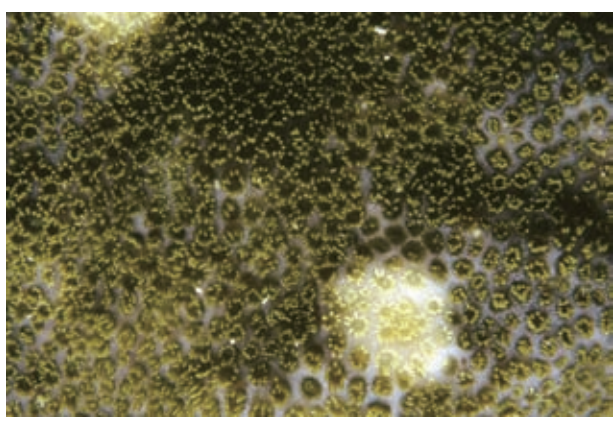
Widely distributed throughout the Indo-Pacific, from the Red Sea and east Africa, to French Polynesia. Also recorded in Hawaii.

Remarks

This species is similar to *Porites lobata*, but the former is distinguished by having no pali.



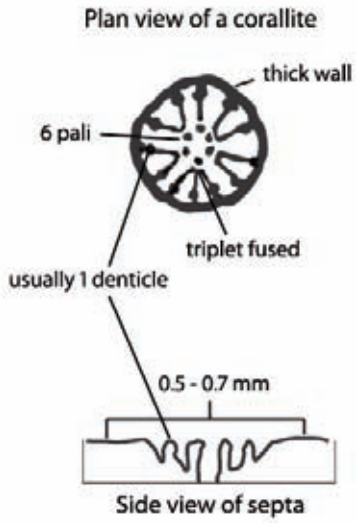
A massive colony of *Porites solida* with undulating surface (Nanwan).



Corallites of *Porites solida.*

Porites rus (Forskål, 1775)

Chinese Name 聯合微孔珊瑚
Family Poritidae
Publication *Madrepora rus* Forskål (1775)
Synonymy *Porites rus* Veron & Pichon (1982); Veron (1986); Nishihira & Veron (1995); Veron (2000)
Porites irregularis Nemenzo (1955)
Porites hawaiiensis Yabe & Sugiyama (1935); Crossland (1952)
Porites iwayamaensis Eguchi (1930); Zou (1975)
Porites convexa Yabe & Sugiyama (1932)



Taxonomic Description & Diagnosis

Colonies display a wide variety of growth forms, may be encrusting, horizontal laminae, thick columnariform lobes with a laminar skirt at the base, branching, sub-massive or irregularly massive. Large colonies may display different combinations of these growth forms. Corallites are usually widely spaced, separated by an extensive reticular coenosteum. Only on laminar margins or concave parts between the branches and ridges, may the corallites be concentrated. Calices are small, and less than 0.7 mm in diameter. Septa are thick, and triplets are fused. Usually six pali are well developed, with the one of dorsal directive being absent. One, rarely two, denticles are present on upper septal margins. Columella is absent or very inconspicuous.

Living colonies are usually cream, yellow or blue.

Ecology

Found in most reef biotopes, especially shallow reef environments.

Occurrence

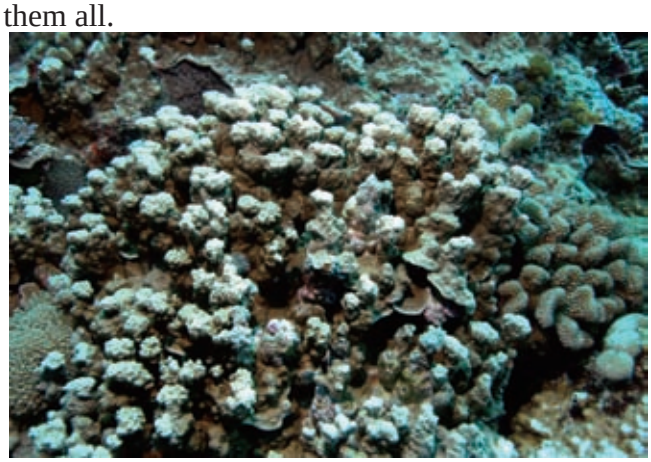
All reef areas around Taiwan except northern and northeastern coast

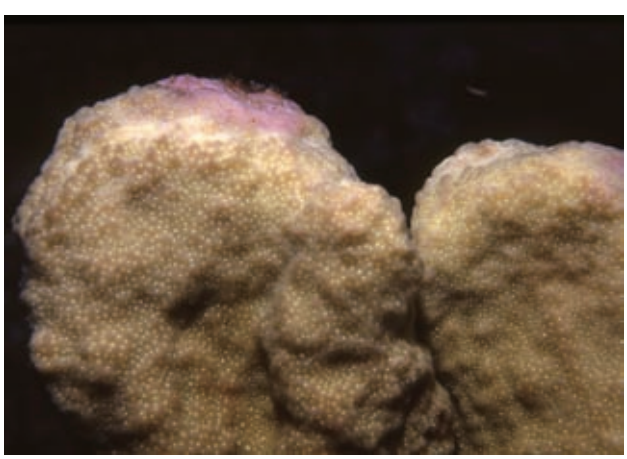
Distribution

Widely distributed throughout the Indo-Pacific, from the Red Sea and east Africa, to Marshall Islands and Samoa. Also recorded in Hawaii and east Pacific.

Remarks

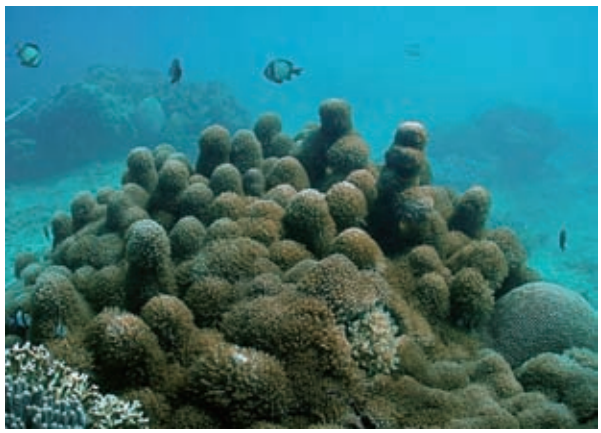
This species is readily distinguished from other *Porites* species due to its smallest corallites of them all.


A colony of *Porites rus* (Nanwan).


A close-up view showing small corallites of *Porites rus.*

Goniopora columna Dana, 1846

Chinese Name 柱形管孔珊瑚
Family Poritidae
Publication *Goniopora columna* Dana (1846)
Synonymy *Goniopora columna* Nemenzo (1955); Veron & Pichon (1982); Veron (1986); Nishihira & Veron (1995); Veron (2000)



Taxonomic Description & Diagnosis

Colonies are columnar, consisting of short columns with rounded tops and usually oval in transverse section. Corallites are uniformly sized, with calices 3.5-4.5 mm in diameter. Walls are up to 1.5 mm in thickness, but highly perforate. Septa are fine, highly perforate, and irregular near the top of columns, but well defined near the base of the columns. All 24 septa are usually distinguishable; sometimes the six primary septa are distinct. Columella is diffuse near column tops and broad near the base, reaching up to 1/2-3/4 the calice diameter.

Living colonies are usually uniformly brown, yellow or green, with very large, fleshy polyps and the oral cones are pink or white. Polyps have 24 tentacles.

Ecology

Found in many reef environments, often forming large stands in turbid waters.

Occurrence

All reef areas in Taiwan, abundant in the Inner Sea of Penghu Islands.

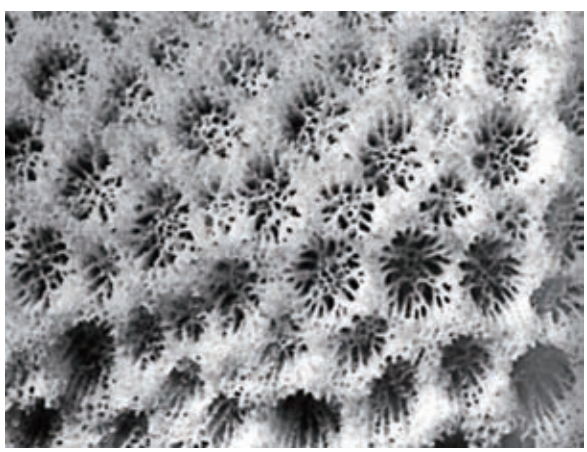
Distribution

Widely distributed throughout the Indo-Pacific, from the Red Sea and Mozambique Channel to Marshall Islands and Fiji.

Remarks

This species is similar to *G. lobata*, the two being mainly distinguished by differences in their growth forms, the former being columnar and the latter being massive.

Polyps of *Goniopora columna.*



Corallites of *Goniopora columna.*

Goniopora djiboutiensis Vaughan, 1907

Chinese Name 大管孔珊瑚
Family Poritidae
Publication *Goniopora djiboutiensis* Vaughan (1907)
Synonymy *Goniopora djiboutiensis* Veron & Pichon (1982); Veron (1986); Nishihira & Veron (1995); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are sub-massive to columnar, usually the base is encrusting. Corallites are polygonal to circular, with walls 1.5 mm thick near column tips and 3 mm thick near the bases. Calices are up to 4.5 mm in diameter and 1.5 mm in depth. Septa are short, uniformly sized, regularly space, and finely dentate. Columella is very prominent, dome-shaped, and may be distinguished into six fused parts.

Living colonies are usually brown or green, either pale or dark. They are readily distinguished by polyps with large oral cones which are usually white or pink, but may also be the same color as the 24 tentacles.

Ecology

Found in many reef environments, often forming large stands in turbid waters.

Occurrence

All reef areas in Taiwan.

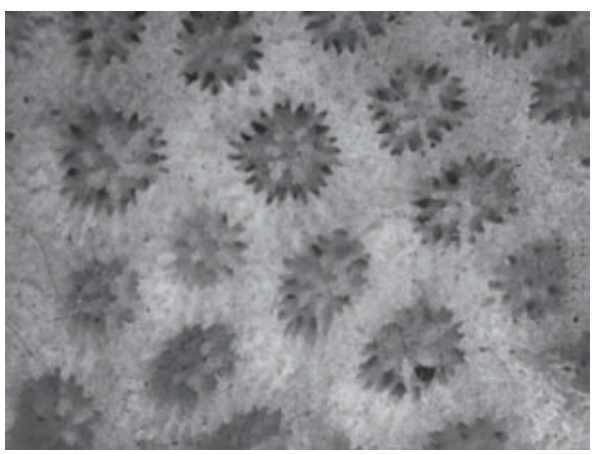
Distribution

Widely distributed throughout the Indo-Pacific, from Gulf of Aden along east Africa to Marshall Islands.

Remarks

This species is distinguished from *G. lobata* by its shallower calices, large columellae, and comparatively shorter septa. It is also similar to *G. somaliensis*, but this species has larger corallites, coarser septa, and generally sub-massive growth form.

Polyps of *Goniopora djiboutiensis.*



Corallites of *Goniopora djiboutiensis.*

Goniopora lobata Edwards & Haime, 1860

Chinese Name 團塊管孔珊瑚
Family Poritidae
Publication *Goniopora lobata* Edwards & Haime, 1860
Synonymy *Goniopora lobata* Bernard (1903); Vaughan (1918); Crossland (1952); Wells (1955); Veron & Pichon (1982); Veron (1986); Nishihira & Veron (1995); Veron (2000)


A hemispherical colony of *Goniopora lobata.*

Taxonomic Description & Diagnosis

Colonies are massive, hemispherical, or columnar, with columns often up to 15 mm thick. Corallites are polygonal to circular, with porous walls, and calices of 3-5 mm in diameter. Septa are 24 in number, arranged in three orders of 6, 6, 12, or in two orders of 12, 12 each, or may also be irregular length. Pali are not developed. Columella is usually small, but may be up to half the calice diameter sometimes.

Living colonies are usually brown, yellow or green, with very large polyps which have 24 tentacles. Oral cones and tentacles tips are often in contrasting colors.

Ecology

Found in many reef environments, often forming large stands in turbid waters.

Occurrence

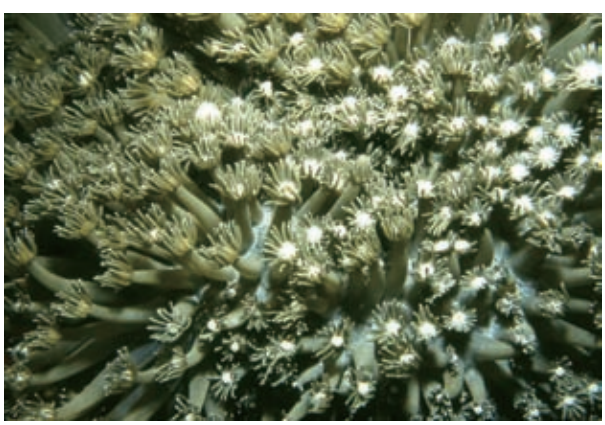
All reef areas in Taiwan.

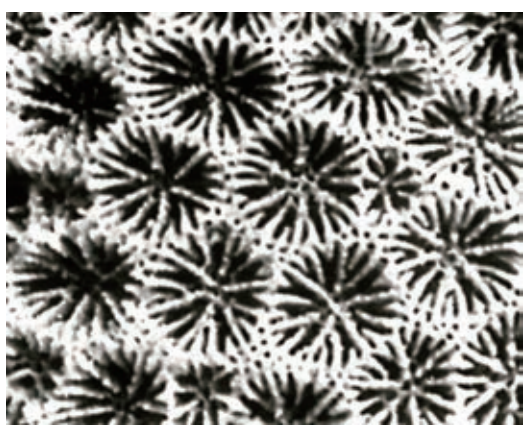
Distribution

Widely distributed throughout the Indo-Pacific, from the Red Sea along east Africa to Marshall Islands and Fiji.

Remarks

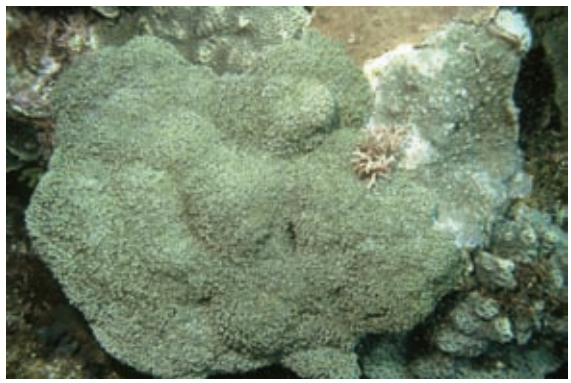
Colonies from shallow, turbid biotopes, protected from strong wave action, are usually massive-columnar. Columella is usually small, and septa are in three orders. Colonies from outer reef slopes are mostly sub-massive, seldom forming columns. Columella is large, commonly up to half the calice diameter, with septa arranged in two cycles. Colonies from biotopes intermediate of the environments described above, have skeletal structures that are intermediate between those two extremes above.


Polyps of *Goniopora lobata.*


Corallites of *Goniopora lobata.*

Goniopora stutchburyi Wells, 1955

Chinese Name 平滑管孔珊瑚
Family Poritidae
Publication *Goniopora stutchburyi* Wells (1955)
Synonymy *Goniopora stutchburyi* Veron & Pichon (1982); Veron (1986); Nishihira & Veron (1995); Veron (2000)
Goniopora wotouensis Zou & Song (1975)



An encrusting colony of *Goniopora stutchburyi.*

Taxonomic Description & Diagnosis

Colonies are encrusting to massive, with surfaces being smooth, flat, undulating or nodular. Corallites are superficial, polygonal or circular in outline, with flat-bottomed calices of 1.6-2.9 mm in diameter. Walls are weakly developed, consisting of irregular aggregation of granules. Corallites have 17-30 septa of uniform width and tightly compacted. Septa are not arranged in orders, but fuse in groups of two to six. All septa are thickly granulated on their sides and margins, some septa also bear regular dentations which appear as concentric circles of granules that may be up to seven concentric rows. Columella is developed, with varying structures.

Living colonies have pale brown or cream polyps, sometimes with pale blue oral cones. The polyps are short and wide, with 24 short, tapering tentacles of similar sizes or with six tentacles being larger than the rest.

Ecology

Found in shallow reef environments.

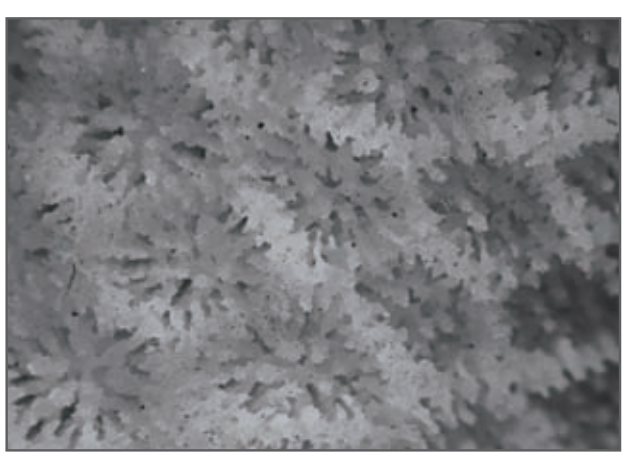
Occurrence

All reef areas in Taiwan.

Distribution

Distributed throughout the Indo-Pacific, from Sri Lanka, to Japan, Marshall Islands and French Polynesia.

Polyps of *Goniopora stutchburyi.*



Corallites of *Goniopora stutchburyi.* (x 10)

Goniopora tenuidens (Quelch, 1886)

Chinese Name 柔軟管孔珊瑚
Family Poritidae
Publication *Rhodaraea tenuidens* Quelch (1886)
Synonymy *Goniopora tenuidens* Vaughan (1918); Ma (1959); Utinomi (1965); Chevalier (1968); Scheer & Pillai (1974); Veron & Pichon (1982); Veron (1986); Nishihira & Veron (1995); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are massive, with hemispherical , spherical or irregular heads. Corallites are circular or polygonal, with calices of diameter of 2.5-3.1 mm and walls that are composed of evenly exsert septa which have granulated tips. Septa are arranged in three orders, the first order septa are without pali. Instead, second order septa are very prominent, with large pali that are thicker than other septa. All septa are dentate, with the regular dentations usually in rows down the corallites walls. Six pali are well-developed, forming a distinct crown. Columella is small.

Living colonies are uniformly colored, usually bright blue, green or brown. Those from deeper reef with poor illumination are usually dull brown. Polyps are with 24 terete tentacles of even length, with blue, white or pink tips.

Ecology

Most often found in subtidal reef environments, especially lagoons.

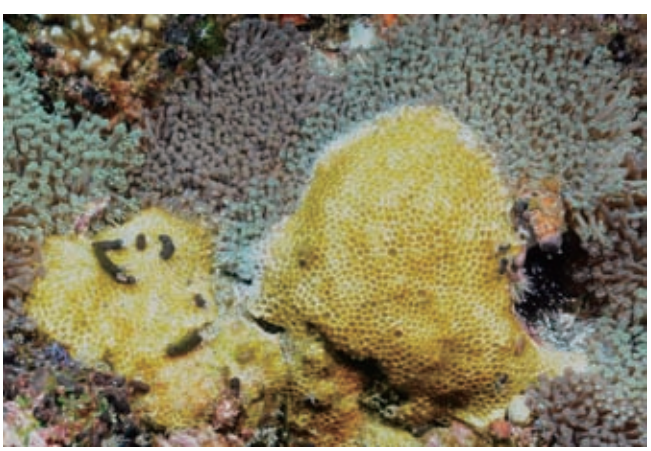
Occurrence

All reef areas in Taiwan, but often rare.

Distribution

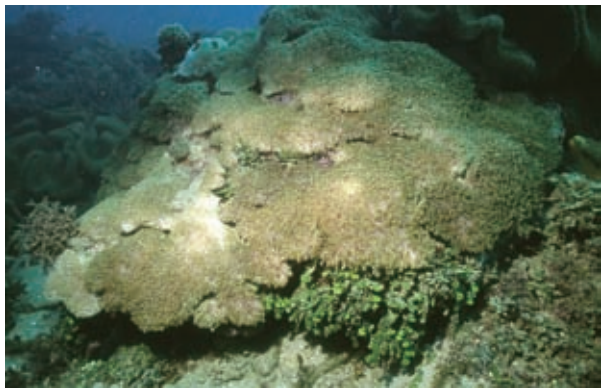
Widely distributed throughout the Indo-Pacific, from the Red Sea and Mozambique Channel to Marshall Islands and Fiji.

A massive colony of *Goniopora tenuidens* with extending polyps.



Polyps and skeleton of *Goniopora tenuidens.*

Goniopora minor Crossland, 1952



Chinese Name 小管孔珊瑚

Family Poritidae

Publication *Goniopora minor* Crossland (1952)

Synonymy *Goniopora pedunculata* Nemenzo (1955)

Goniopora minor Nemenzo (1955); Ma (1959); Veron & Pichon (1982); Veron (1986); Nishihira & Veron (1995); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are encrusting to massive with hemispherical heads. Corallites are circular, with a diameter of 2.5-4 mm and walls that are up to 1.9 mm thick, and are perforate in lightly calcified colonies; thus calices are 1.9-3.0 in diameter. Septa are arranged in three orders, the first two being sub-equal, with a smaller or rudimentary third order septa. All septa are dentate, with elaborated tips on the dentations. Six pali are well-developed, forming a distinct crown. Septa and pali are thick from being heavily granulated. Columella is weakly developed.

Living colonies are usually different shades of brown or green, usually with pale tips and distinctively colored oral discs on the 24 polyp tentacles.

Ecology

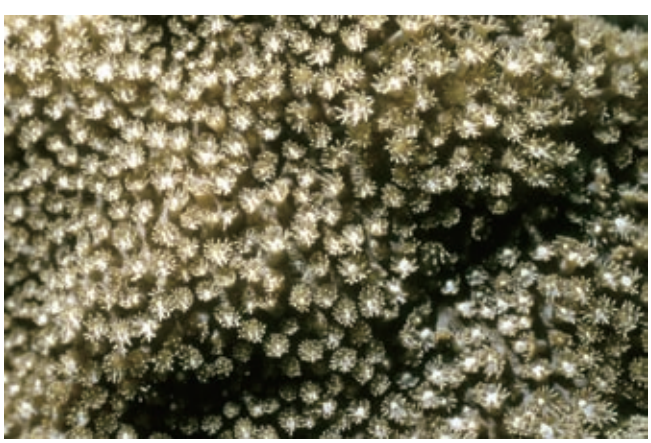
Most often found in subtidal reef environments, especially lagoons.

Occurrence

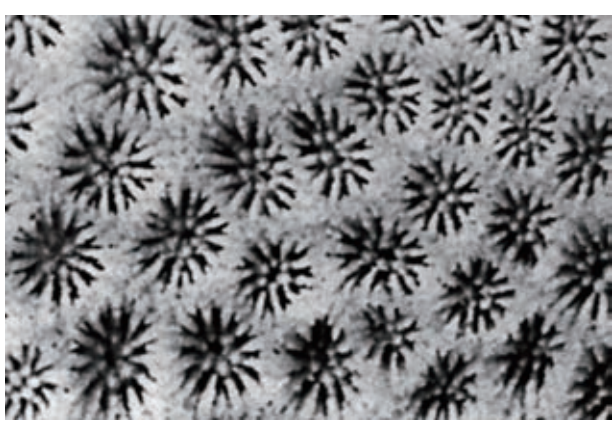
All reef areas in Taiwan.

Distribution

Widely distributed throughout the Indo-Pacific, from the Red Sea along east Africa, to Okinawa, Marshall Islands and French Polynesia.



Polyps of *Goniopora minor.*



Corallites of *Goniopora minor.* (x 4)

Family Agariciidae Gray, 1847

Family Agariciidae includes five extant genera, *Gardineroseris, Coeloseris, Leptoseris, Pavona,* and *Pachyseris,* all are widely distributed throughout the Indo-Pacific, and are commonly found in waters all around Taiwan. Recent phylogenetic analyses indicate that genus *Pachyseris* is more distantly related to the other four genera, and may belong to a different family. However, more research is needed to elucidate the phylogenetic relationship between these genera, thus the genus *Pachyseris* will remain in Family Agariciidae temporarily.

Members of Agariciidae are all colonial, only parts of the fossil members are solitary. Colonies are usually formed by intratentacular or circumoral budding. Corallite walls may be absent, poorly developed, or formed from synapticulae. Septa are fine, regularly distributed, and are mostly confluent between the centers. Thus the corallites are distributed in a reticulate pattern. Columella may be absent or derived from the synapticulae. Polyps have minute tentacles and are usually extended only at night. Colonies are usually massive, plate-like or foliaceous.

Agariciidae species are one of the more distinct groups of corals with readily recognized characteristics, commonly found in protected reef slopes and lagoons, whereas some may occur on reef flats or reef slopes more exposed to wave action.

Simplified key to genera of Agariciidae

Colonies foliaceous

Corallites align in valleys parallel to colony margins ..... *Pachyseris*

Corallites connected by radiating septo-costae, no valleys are formed

Fronds or plates are bifacial..... *Pavona*

Fronds or plates are unifacial ..... *Leptoseris*

Colonies massive

Corallites separated by acute ridges ..... *Gardineroseris*

Corallites cerioid, without acute ridges ..... *Coeloseris*

Columnar colonies of *Pavona clavus.*

Two color forms of *Leptoseris explanata.*

Pavona venosa (Ehrenberg, 1834)

Chinese Name 板葉雀屏珊瑚
Family Agariciidae
Publication *Polyastra venosa* Ehrenberg (1834)
Synonymy *Pavona (Polyastra) venosa* (Ehrenberg); Nemenzo (1955)
Pavona (Polyastra) obtusata Nemenzo (1955); Stephenson & Wells (1955)
Pavona venosa Veron & Pichon (1980); Veron (1986); Dai & Lin (1992); Nishihira & Veron (1995); Veron (2000)
Specimen TUIO-C-7031 (Nanwan Bay)

Taxonomic Description & Diagnosis

Colonies are massive with undulating surface or encrusting. Corallites are discrete polygonal or arranged in short valleys. The width of corallites and/or valleys varies from 0.5-2.5 mm in diameter. Sometimes sharp, acute and high thecae are developed. Three orders of septa are frequently distinguishable though the third order is normally developed only near the thecal rim. Septa are thin and regularly, widely spaced, with granulated sides and smooth to slightly dentate margins. Columellae are absent or poorly developed.

Living colonies are pale brown or yellow-brown, sometimes they may be mottled.

Ecology

Occurs in shallow reef environments, most commonly found on shallow-water reef flats or reef margins.

Occurrence

All reef areas around Taiwan and offshore islets.

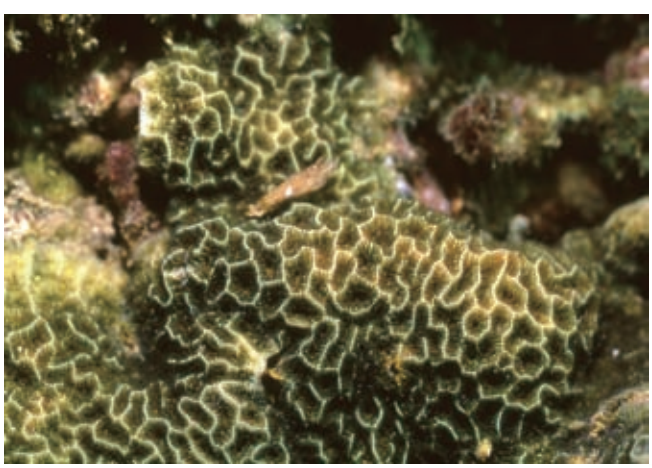
Distribution

Widely distributed throughout the Indo-Pacific, from the Red Sea and east Africa to Fiji.

Remarks

This species resembles *Pavona varians*, the latter is distinguished by low collines that are not as sharp, with only two orders of septa. This species is also similar to *Gardineroseris palnulata*.

A massive colony of *Pavona venosa* (Nanwan).



Corallites of *Pavona venosa* arranged in short valleys.

Pavona cactus (Forskål, 1775)

Chinese Name 繡球雀屏珊瑚
Family Agariciidae
Publication *Madrepora cactus* Forskål (1775)
Synonymy *Pavona cactus* (Forskål); Vaughan (1918); Yabe et al. (1936); Eguchi (1938); Ma (1959); Veron & Pichon (1980); Veron (1986); Dai & Lin (1992); Nishihira & Veron (1995); Veron (2000)
Pavona praetorta Yabe et al. (1936); Eguchi (1938); Wells (1954); Ma (1959)
Specimen NMNS 000048-13430; SYUMB-C 205; TUIO-C-7011 through 7013 (Nanwan Bay and Yenliao Bay)


Bifacial fronds of *Pavona cactus.*

Taxonomic Description & Diagnosis

Colonies always consist of thin, bifacial fronds which may be flat, twisted to highly anastomosed, and frequently covers extensive areas. Individual fronds are approximately 4 cm wide and 3-5 mm thick. Calices are superficial, <5 mm wide, arranged in rows parallel to the margins and widely separated. Septo-costae are in two alternating orders, arranged in regular straight rows perpendicular to the margin. They are thin and heavily granulated with smooth margins. Those of the first order are slightly more exsert and more granulated than the second order. The columellae are often poorly developed, irregular or styliform, and consist of fused trabeculae.

Living colonies are pale brown or yellow, often with white margins.

Ecology

Usually found in turbid water protected from wave actions, where sedimentation rate is relatively high, such as lagoons, some reef margins and reef fronts.

Occurrence

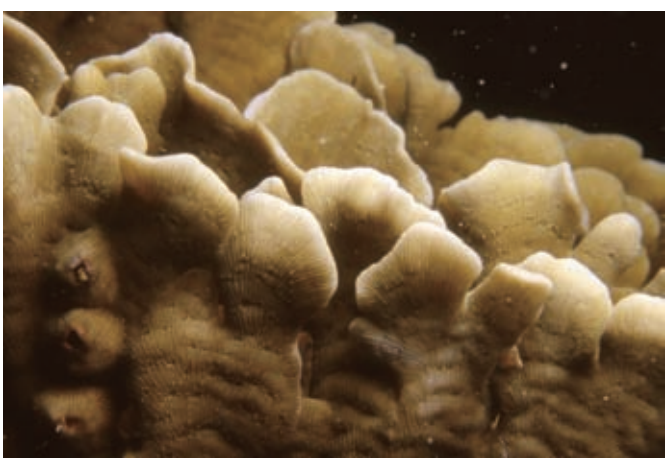
This species is widely distributed on the reefs of Taiwan.

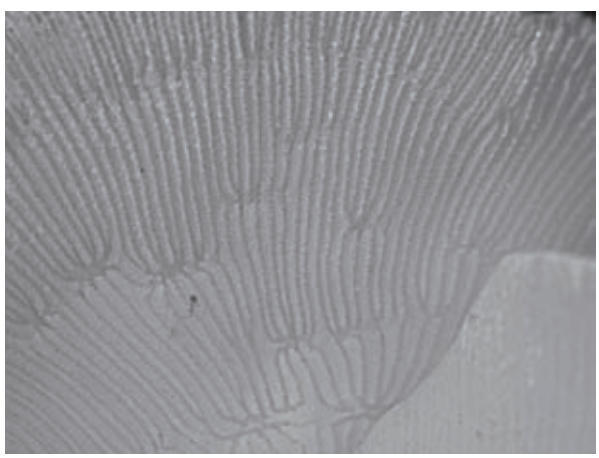
Distribution

Widely distributed throughout the Indo-Pacific, from the Red Sea and east Africa to French Polynesia.

Remarks

Coral colonies from different environment often vary in thickness of the fronds.


A close-up view of the fronds.


Corallites and septo-costae of *Pavona cactus.*

Pavona clavus (Dana, 1846)

Chinese Name 柱形雀屏珊瑚
Family Agariciidae
Publication *Agaricia clavus* Dana (1846)
Synonymy *Pavona clavus* (Dana); Wells (1974); Ma (1959); Chevalier (1968); Veron & Pichon (1980); Veron (1986); Dai & Lin (1992); Nishihira & Veron (1995); Veron (2000)

A large columnar colony of *Pavona clavus.*

Taxonomic Description & Diagnosis

Colonies are massive to encrusting, with larger colonies displaying a tendency to become columnar or clavate, and the circular or oval columns may reach 10 cm in thickness and 1.5 m in height. Calices are 2.5-3.5 mm in diameter, irregularly distributed or arranged in short shallow valleys. Septo-costae are thick, straight, closely packed and arranged in two alternate orders, with those of the first order being thinner and reaching the columella. All septa have steeply sloping inner margins, with smooth margins and granulated sides. Columella is absent or rudimentary.

Living colonies are uniform pale grey or brown.

Ecology

Usually occur in shallow reef environments, most often found in exposed biotopes where the current is slightly strong.

Occurrence

All reef areas around Taiwan and offshore islets, except northern Taiwan.

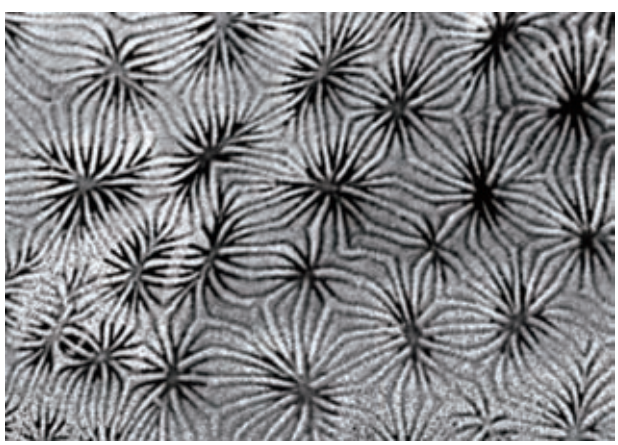
Distribution

Widely distributed throughout the Indo-Pacific, from Red Sea and Madagascar to Marshall Islands and Fiji. Also recorded in Hawaii and the Galapagos of east Pacific.

Remarks

This species is similar to *Pavona minuta*. The former is distinguished by its more irregular calices, irregular septa, and the columella being absent or rudimentary.

A close-up view of the columnar colony showing polyps.



Corallites of *Pavona clavus.* (x 4)

Pavona decussata (Dana, 1846)

Chinese Name 板葉雀屏珊瑚
Family Agariciidae
Publication *Pavonia decussata* Dana (1846)
Synonymy *Pavona decussata* (Dana); Yabe et al. (1936); Crossland (1952); Stephenson & Wells (1955); Nemenzo (1955); Utinomi (1965, 1971); Veron & Pichon (1980); Veron (1986); Dai & Lin (1992); Nishihira & Veron (1995); Veron (2000)
Pavona seriata Yabe et al. (1936)
Specimen NMNS 000048-13361 through 13426; SYUMB-C 014; 202, 206; TUIO-C-7021 through 7025 (Nanwan Bay and Yenliao Bay).


A colony of *Pavona decussata* with anastomosing fronds.

Taxonomic Description & Diagnosis

Colonies are often composed of vertical, anastomosing fronds. Fronds are thick (3-6 mm) and bifacial. Encrusting or massive colonies may be found on exposed substrate. Sometimes both massive and frondose growth forms are found in a colony. Calices are deeply seated, about 3 mm in maximum dimension. They are irregularly distributed or arranged in short rows. Septo-costae are in two alternating orders. Those of the first order are thicker, far more exsert and granulated than the second order. Columellae are poorly developed and lie deeply within calices.

Living colonies are brown, greenish or creamy-yellow in color.

Ecology

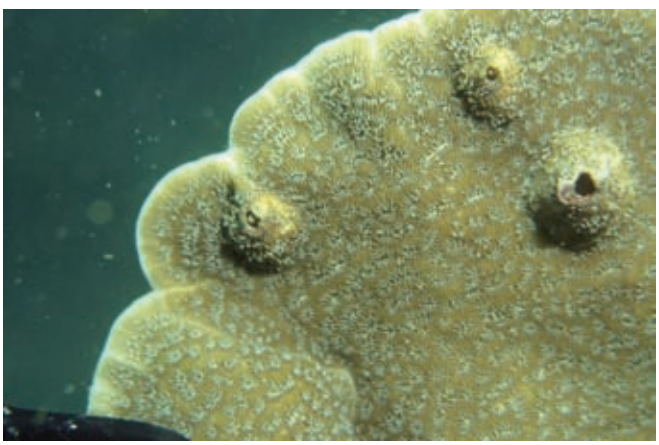
Occur in most coral reef environments, most often found on exposed shallow-water substrate where the sedimentation rate is relatively high.

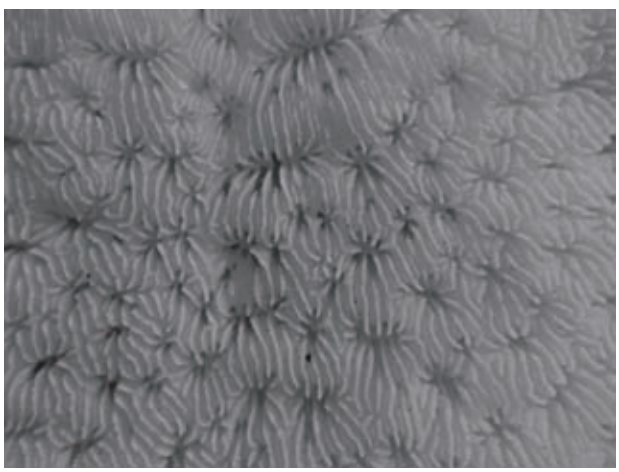
Occurrence

This species is common at both northern and southern Taiwan, particularly northern Taiwan.

Distribution

Widely distributed throughout the Indo-Pacific, from the Red Sea and east Africa to French Polynesia.


The surface of a frond.


Corallites of *Pavona decussata.* (x 2)

Pavona explanulata (Lamarck, 1816)

Chinese Name 變形雀屏珊瑚
Family Agariciidae
Publication *Agaricia explanulata* Lamarck (1816)
Synonymy *Pavona explanulata* Veron & Pichon (1980); Veron (1986); Dai & Lin (1992); Nishihira & Veron (1995); Veron (2000)
Specimen TUIO-C-249, 7061, 7062 (Nanwan Bay and Yenliao Bay)

Taxonomic Description & Diagnosis

Colonies are usually encrusting or laminar, with larger colonies tending to become massive, plate-like or columnar. Corallites vary in size from 2.5 to 6.0 mm in diameter. They are irregularly arranged, widely spaced near colony center and more crowded toward the edge. Corallites have well-defined, deep fossae which are largely filled with septa. Septo-costae are compact and in two alternating orders. Septa of the first order have slightly serrated margins and are much thicker, more exsert and granulated than the second order. All septo-costae are closely packed and confluent among three or more corallites. Columellae consist of fused trabeculae. Thecae are absent.

Living colonies display a wide range of colors, mostly are dark or pale brown, yellow, pink or grey, sometimes they are mottled.

Ecology

Occur in most coral reef environments.

Occurrence

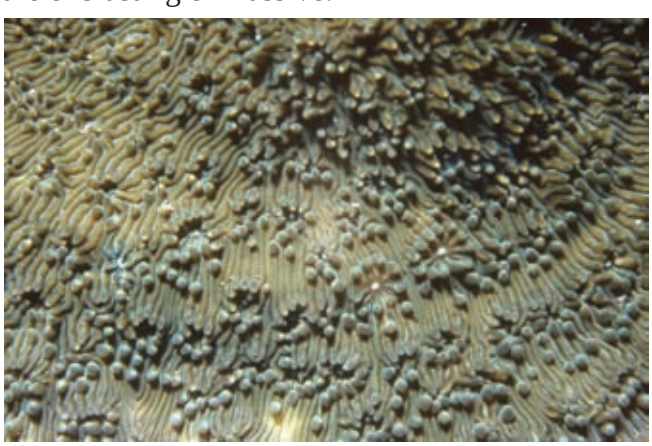
This species is common on deep water slopes at northern Taiwan, though not as common at southern Taiwan.

Distribution

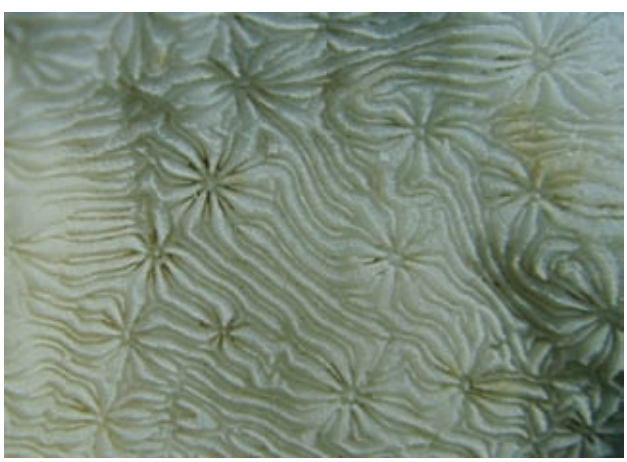
Widely distributed throughout the Indo-Pacific, from the Red Sea and east Africa to French Polynesia and east Pacific.

Remarks

Colonies in protected environment are often unifacial plates, while in exposed environment they are encrusting or massive.



A close-up view of the colony surface with extending polyps.



Corallites of *Pavona explanulata.* (x 5)

Pavona maldivensis (Gardiner, 1905)

Chinese Name 馬島雀屏珊瑚
Family Agariciidae
Publication *Siderastrea maldivensis* Gardiner (1905)
Synonymy *Pavona (Pseudocolumnastrea) pollicata* Wells (1954); Ma (1959)
Pavona maldivensis Veron & Pichon (1980); Veron (1986); Dai & Lin (1992); Nishihira & Veron (1995); Veron (2000)
Specimen TUIO-C-7081, 7082 (Yenliao Bay)

Taxonomic Description & Diagnosis

Colonies are encrusting with thin, free laminar margins, which may reach 30 cm across. Sometimes they are columnar or massive, formed of repeated overgrowth, seldom more than 20 cm high, except in protected environments some colonies may be large. Corallites are circular, 2-4 mm in diameter. They may be compact or widely separated. Thecae is well-developed, protruding up to 2 mm. Septo-costae are alternating, continuous and closely compacted. There are about 15-25 septa in a corallite. All septo-costae are heavily granulated on the sides, and margins may be smooth or crenellated. The inner margins are steep, almost vertical near the columella. The columella is solid, elongate, and composed of a few fused trabeculae.

Living colonies are usually pale or dark brown or green, with pale tentacles.

Ecology

Usually found in sheltered reef environments, though it is uncommon.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

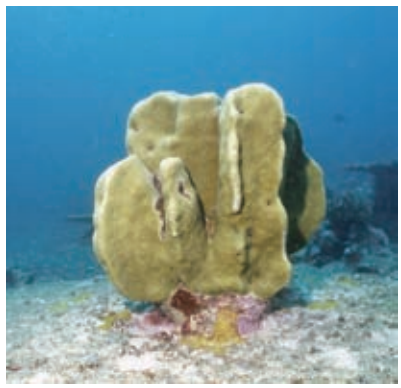
Widely distributed throughout the Indo-Pacific, from the Red Sea and east Africa to French Polynesia and east Pacific.

An encrusting colony of *Pavona maldivensis* with laminar margin.

A close-up view of the corallites.

Pavona minuta Wells, 1954

Chinese Name 小雀屏珊瑚
Family Agariciidae
Publication *Pavona minuta* Wells (1954)
Synonymy *Pavona minuta* Veron & Pichon (1980); Veron (1986); Dai & Lin (1992); Nishihira & Veron (1995); Veron (2000)
Specimen NMNS 000048-13360; SYUMB-C 204; TUIO-C-7041, 7042 (Nanwan Bay)



A massive colony of *Pavona minuta* (Dongsha).

Taxonomic Description & Diagnosis

Colonies are massive with smooth undulating surface. They often attain large size and form high columns or flat plates. Calices are cerioid, approximately 2-3 mm in diameter, and regularly spaced, with centers 2.5-3 mm apart. Septo-costae are thick, straight and closely packed, with granulated sides and smooth margins. They are arranged in two alternate orders of 8-10 each, with those of the same order being continuous between adjacent corallites. There is no paliform lobe. Columellae are rudimentary or styliform, consisting of fused trabeculae.

Living colonies are yellow, creamy brown or brownish-green.

Ecology

Occur in shallow reef environments, most often found on shallow exposed reef margins.

Occurrence

Southern Taiwan, Ludao, Dongsha Atoll, Taiping Island.

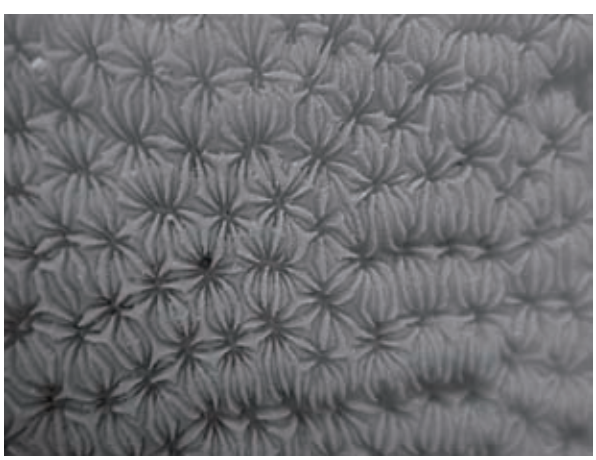
Distribution

Widely distributed from east Indian Ocean to the Pacific, from Bay of Bengal to Marshall Islands and Samoa.

Remarks

This species is similar to *Pavona clavus* also with small calices. The former is distinguished by its more regular calices, with fewer, more regular, more exsert septa, and well developed columella.

A close-up view of *Pavona minuta* showing the distribution of corallites.



Corallites of *Pavona minuta.* (x 4)

Pavona varians Verrill, 1864

Chinese Name 變形雀屏珊瑚
Family Agariciidae
Publication *Pavona varians* Verrill (1864)
Synonymy *Pavona varian* Vaughan (1918); Yabe et al. (1936); Eguchi (1938); Crossland (1952); Wells (1954); Nemenzo (1955); Ma (1959); Veron & Pichon (1980); Veron (1986); Dai & Lin (1992); Nishihira & Veron (1995); Veron (2000)
Specimen TUIO-C-7051 through 7057 (Nanwan Bay and Yenliao Bay)

Taxonomic Description & Diagnosis

Colonies are encrusting, massive, or laminar. Massive forms are often irregular in shape. Laminar colonies are usually thin, flat, and develop mostly under overhangs. Colony surface is irregular and covered with low collines, which are usually sinuous and irregular in length and direction. Corallites are discrete or arranged in clusters between the collines. Calices are very small, only 1mm in maximum dimension. Septa-costae are usually in two orders. Septa of the neighboring corallites are often continuous. Septa are finely granulated. Columellae are plate-like or rudimentary.

Living colonies display a wide variety of colors, primarily with pale tops and dark sides. The common colors are yellow, green or brown.

Ecology

Occurs in most reef environments, most often found on shallow reef flats or reef margins.

Occurrence

This species is widely distributed in coral communities of Taiwan.

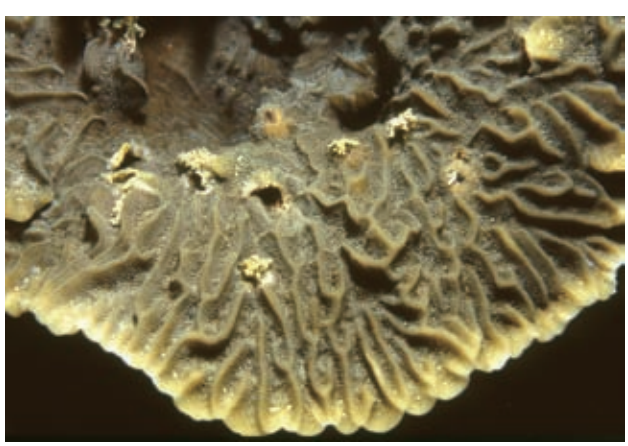
Distribution

Widely distributed throughout the Indo-Pacific, from the Red Sea and east Africa to French Polynesia and east Pacific.

Remarks

This species is very similar to *Pavona venosa*, the latter is easily distinguished by its sharp, acute collines, with three orders of wider-spaced septa, and less developed columella.

An encrusting colony of *Pavona varians* (Dongsha).



Irregular collines on the surface of a colony.

Leptoseris explanata Yabe and Sugiyama, 1941

Chinese Name 環柔紋珊瑚
Family Agariciidae
Publication *Leptoseris explanata* Yabe and Sugiyama (1941)
Synonymy *Leptoseris explanata* Veron & Pichon (1980); Veron (1986); Dai & Lin (1992); Nishihira & Veron (1995); Veron (2000)
Specimen TUIO-C-7101 (Yenliao Bay)

Taxonomic Description & Diagnosis

Colonies are mostly flat plates of forming horizontal bifurcating branches. Colony margins are thin and fragile. Colonies formed by circumoral, followed by marginal budding. Central corallites are often distinguishable in small colonies. Calices are elliptical to circular, <6 mm in maximum dimension, which are usually inclined towards the margin and irregularly scattered on the upper surface. Septa-costae are unequal and in alternate cycles. Those of the first order are thicker, more exsert and more granulated on the margins. All septo-costae are parallel, regularly radiated from the calices and run perpendicular to the margin. Columella is spongy and composed of fused trabeculae. Thecae are well developed in their inner margins. The undersurface is smooth and finely striated.

Living colonies are pale brown or yellow brown, sometimes margins are white.

Ecology

Usually found on vertical or overhangs, especially of lower reef slopes.

Occurrence

This species is common on the deep water slopes or terraces of 15 to 25 m deep at northern Taiwan, but uncommon at southern Taiwan.

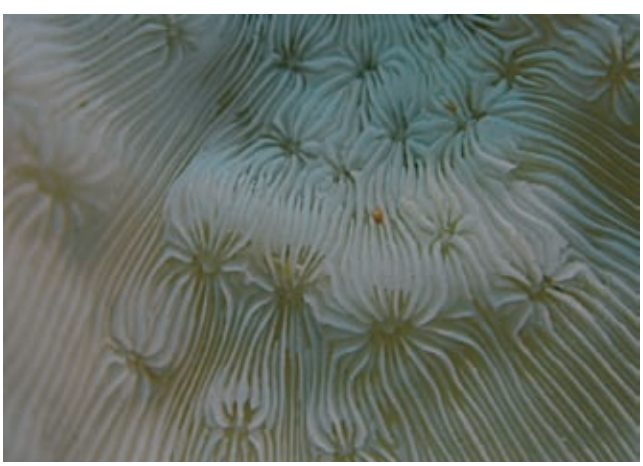
Distribution

Widely distributed throughout the Indo-Pacific, from the Red Sea and east Africa to Samoa.

Remarks

This species is recognized by its prominent, alternating costae.

Corallites and septo-costae of *Leptoseris explanata*.



Skeleton of *Leptoseris explanata* showing corallites and septo-costae structure.

Leptoseris yabei (Pillai and Scheer, 1976)

Chinese Name 葉形柔紋珊瑚
Family Agariciidae
Publication *Pavona yabei* Pillai & Scheer (1976)
Synonymy *Pavona yabei;* Dai & Lin (1992))
Leptoseris yabei (Pillai & Scheer); Veron & Pichon (1980); Veron (1986); Nishihira & Veron (1995); Veron (2000)
Specimen TUIO-C-7071, 7072, 7073 (Nanwan Bay and Yenliao Bay)

Taxonomic Description & Diagnosis

Colonies are unifacial laminar or as a series of plates arranged in overlapping tiers. Colony consists of roughly concentric carinae and well developed collines forming radiating ridges. The well developed collines and carinae are frequently found together, grouping the calices into rectangular pits. The calices are inclined toward the colony margin. Septo-costae are arranged in two alternating orders. Those of the first order are thicker, more exsert, and have steeper inner margins than those of the second order. Septa are granulated. Columella is lamellar or pinnacle-shaped. Theca is absent.

Living colonies are various shades of brown or yellowish, often with pale margins.

Ecology

Occurs in many reef environments, most often found on flat substrates.

Occurrence

This species is widely distributed in the coral communities of Taiwan.

Distribution

Distributed throughout the west Pacific, from the Indonesian Archipelago to Japan, Fiji, and Marshall Islands. Also recorded from the Maldives, Red Sea, and southwest off Madagascar.

Remarks

This species resembles *L. mycetoseroides*, but the former is readily distinguished by their well-developed, radiating collines, with thinner and more alternating septo-costae.

A large colony of *Leptoseris yabei* with overlapping tiers (Nanwan).

Corallites of *Leptoseris yabei.*

Leptoseris hawaiiensis Vaughan, 1907

Chinese Name 夏威夷柔紋珊瑚
Family Agariciidae
Publication *Leptoseris hawaiiensis* Vaughan (1907)
Synonymy *Leptoseris hawaiiensis* Wells (1954); Ma (1959); non Yabe & Sugiyama (1941); Veron & Pichon (1980); Veron (1986); Dai & Lin (1992); Nishihira & Veron (1995); Veron (2000)
Specimen TUIO-C-7111, 7112 (Nanwan Bay)

A plate-shaped colony of *Leptoseris hawaiiensis.*

Taxonomic Description & Diagnosis

Colonies are encrusting or plate-shaped with free margins. Corallites are round or oval, often with raised rims or inclined toward the colony margin. The maximum dimension of corallites is usually <4 mm. Corallites are usually irregularly distributed, or may align in short, concentric rows, frequently with a distinguishable central corallite. Septo-costae are regularly spaced and evenly exsert, giving the coenosteum a smooth appearance. Costae radiate straight being perpendicular to the margins; but they become branched and strongly crenellated when they are near the center of the colony. Calices are deep. Columella is small, compact, and plate-like.

Living colonies are dark or light brown, green or mottled.

Ecology

It is usually found on vertical walls, overhangs, caves or shaded environment below 10 m deep.

Occurrence

All reef areas around Taiwan, but often rare.

Distribution

Widely distributed throughout the Indo-Pacific, from the Red Sea and east Africa to French Polynesia and east Pacific.

Remarks

This species closely resembles *L. scabra*, the former being distinguished by its equal or only slightly alternating septo-costae.

A close-up view of colony surface.

Corallites and septo-costae structures.

Leptoseris mycetoseroides Wells, 1954

Chinese Name 網格柔紋珊瑚
Family Agariciidae
Publication *Leptoseris mycetoseroides* Wells (1954)
Synonymy *Agariciella ponderosa* (Gardiner); Ma (1937)
Leptoseris mycetoseroides Veron & Pichon (1980); Veron (1986); Dai & Lin (1992); Nishihira & Veron (1995); Veron (2000)
Specimen TUIO-C-7091 through 7098 (Yenliao Bay)

Taxonomic Description & Diagnosis

Colonies are primarily encrusting with laminar margins, sometimes forming tiered plates. Corallites are elliptical, round or slightly polygonal. Colony surface with thick, distinctive and contorted carinae bordering short irregular rows of corallites. Calices do not have well defined thecae. Septo-costae are rarely equal. They are fine, regular and densely packed. Two alternate orders of septo-costae are distinguishable; those of the first order are more exsert, granulated and extends further toward the columella. Columella is moderately to well developed, as small compressed pinnacles or prominent plate.

Living colonies are mostly uniform or mottled brown, those in shaded environment are often darker.

Ecology

Usually occurs on reef slopes protected from wave action, most often found on steeply sloping or vertical walls.

Occurrence

This species is more common in northern Taiwan than southern Taiwan.

Distribution

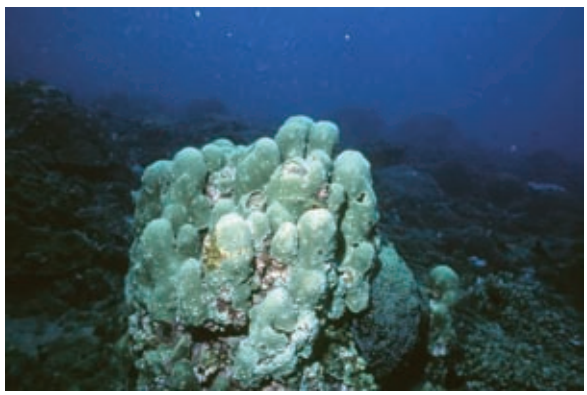
Widely distributed throughout the Indo-Pacific, from the Red Sea and east Africa to French Polynesia and Easter Island.

A colony of *Leptoseris mycetoseroides* (Yenliao Bay).

Contorted carinae on colony surface.

Gardineroseris planulata (Dana, 1846)

Chinese Name 加德紋珊瑚
Family Agariciidae
Publication *Agaricia planulata* Dana (1846)
Synonymy *Agaricia ponderosa* Vaughan (1918); Yabe & Sugiyama (1935); Yabe et al. (1936); Ma (1959)*Gardineroseris ponderosa* (Gardiner); Scheer & Pillai (1974)
Gardineroseris planulata Veron & Pichon (1980); Veron (1986); Dai & Lin (1992); Nishihira & Veron (1995); Veron (2000)
Specimen NMNS 000048-13429; TUIO-C-7121 through 7123 (Nanwan Bay)



A columnar colony of *Gardineroseris explanulata* (Nanwan).

Taxonomic Description & Diagnosis

Colonies are usually massive or columnar, but smaller ones are encrusting with laminar edges. Colony surface is undulated and consists of valleys or pits of variable shapes containing 1-5 centers. Corallites are polygonal or cerioid with solid acute collines. Calices are about 5-7 mm in maximum dimension, and approximately 3 mm deep. Septa are numerous, densely packed and pavonid in appearance. They are thin, equally exsert, and descend abruptly to the endotheca. Sometimes the second order septa are recognized, but they are short and end at the bottom of the collines. All septa are covered with prominent granules. Columella is small and consists of fused trabeculae.

Living colonies are uniform in color, often pale or dark brown, yellow or greenish.

Ecology

Usually occurs on shallow water reef flat or reef margins, also found on walls and under overhangs in clear water.

Occurrence

All reef areas around Taiwan, except northern Taiwan.

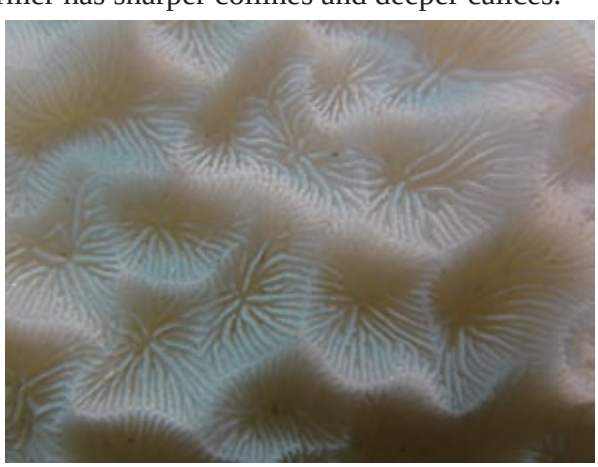
Distribution

Widely distributed throughout the Indo-Pacific, from the Red Sea and east Africa to French Polynesia and east Pacific.

Remarks

This species is similar to *Pavona venosa*, but the former has sharper collines and deeper calices.

Corallites of *Gardineroseris planulata*.



Corallites of *Gardineroseris planulata*. (x 2.5)

Coeloseris mayeri Vaughan, 1918

Chinese Name 正腔紋珊瑚
Family Agariciidae
Publication *Coeloseris mayeri* Vaughan (1918)
Synonymy *Coeloseris mayeri* Yabe et al. (1936); Crossland (1952); Chevalier (1968); Scheer & Pillai (1974); Veron & Pichon (1980); Nishihira & Veron (1995)
Xishasiderastrea sinensis Zou (1975)
Xishasiderastrea granulata Zou (1975)
Specimen NMNS 000048-13358, -13359; SYUMB-C 201; TUIO-C-7131 through 7134 (Nanwan Bay).


A massive colony of *Coeloseris mayeri* .

Taxonomic Description & Diagnosis

Colonies are massive, either rounded, hillocky or columnar. Corallites are cerioid or polygonal, approximately 6 mm in diameter. The common walls are usually thin and acute, but may be rounded and up to 5mm thick sometimes. Septa are arranged in three orders, the third order often being abortive. Occasionally, the orders are not readily distinguishable. The first and second order septa are evenly exsert and joined with those of adjacent corallites. Septa are usually covered with fine granules. Columella is absent.

Living colonies are yellow, pale green or brown, usually with darker calices. Exsert septa sometimes bear white margins.

Ecology

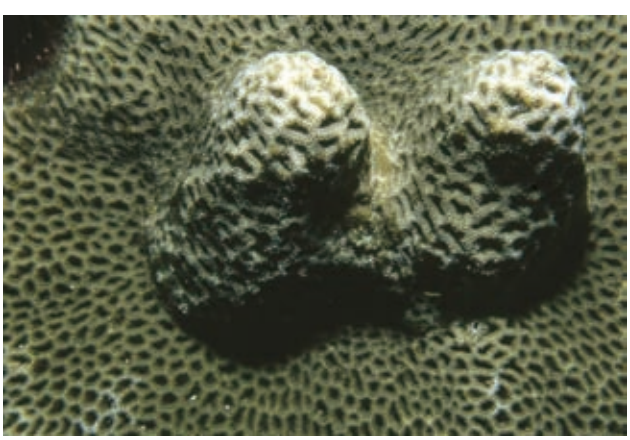
Occupies many reef habitats, most often found on shallow upper reef slopes and lagoons. Tentacles are extended only at night.

Occurrence

This species is common on shallow-water reef flat or reef front at southern Taiwan and Lutao.

Remarks

This species is well-defined, but superficially it resembles some faviids, *Goniastrea* and *Leptastrea*, also *Siderastrea*..


Hillocky structure on colony surface.


Corallites of *Coeloseris mayeri.*

Pachyseris rugosa (Lamarck, 1801)

Chinese Name 異波紋珊瑚
Family Agariciidae
Publication *Agaricia rugosa* Lamarck (1816)
Synonymy *Pachyseris rugosa* (Lamarck); Yabe, Sugiyama & Eguchi (1936); Eguchi (1938); Wells (1954); Ma (1959); Chevalier (1968); Scheer & Pillai (1974); Veron & Pichon (1980); Veron (1986); Dai & Lin (1992); Nishihira & Veron (1995); Veron (2000)*Pachyseris carinata* Ma (1959)*Pachyseris torresiana* Crossland (1952)
Specimen TUIO-C-7141 through 7147 (Nanwan Bay and Xiaoliuchiu)

Taxonomic Description & Diagnosis

Small colonies are encrusting with laminar edges which frequently forming flat, unifacial plates. Large colonies are thickened by upward growth, developing irregular vertical plates, ridges or columns which branch and anastomose. Corallites are hardly distinguishable and arranged in irregular rows which are separated by carinae that are roughly concentric to colony center. Individual rows may be up to 10 cm long, but become shorter and more irregular as the colony's branching pattern becomes more complex. Septo-costae vary greatly according to the shape of carinae and are continuous across the width of the carinae. They are always evenly exsert and regularly spaced. At base, septo-costae are low, wide and relatively thick. Higher on branch they are usually thin and acute with fine granules. The columella is conspicuous and consists of fine plates with a tri-ridged upper margin.

Living colonies are light brown or bluish-grey.

Ecology

This species can be found in a variety of habitats and a wide range of depths, more common on shallow reef flats.

Occurrence

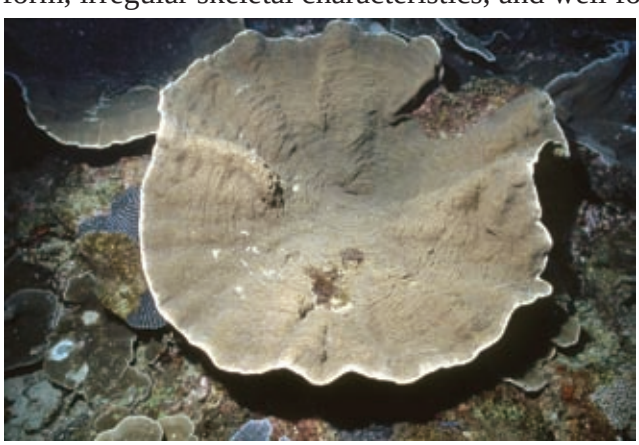
All reef areas in Taiwan.

Distribution

Widely distributed throughout the Indo-Pacific, from east Africa to Samoa. Also recorded from northern Red Sea.

Remarks

This species is similar to *P. speciosa*, the former is easily distinguished by its irregular growth form, irregular skeletal characteristics, and well formed columella.



A flat colony of *Pachyseris rugosa*.

A close-up view showing irregular carinae.

Pachyseris speciosa (Dana, 1846)

Chinese Name 環波紋珊瑚
Family Agariciidae
Publication *Agaricia speciosa* Dana (1846)
Synonymy *Pachyseris speciosa* Dana); Vaughan (1918); Yabe et al. (1936); Eguchi (1938); Crossland (1952); Wells (1954); Ma (1959); Chevalier (1968); Scheer & Pillai (1974); Veron & Pichon (1980); Veron (1986); Dai & Lin (1992); Nishihira & Veron (1995); Veron (2000)
Specimen NMNS 000048-13431; SYUMB-C 203; TUIO-C-7151 through 7154 (Nanwan Bay).

Taxonomic Description & Diagnosis

Colonies are encrusting or unifacial laminar, usually irregularly sheet-like, but are rarely contorted into hollow tubes or columns. Calices are arranged in rows separated by carinae about 2-8 mm wide that are roughly concentric to colony center. Carinae may be wide and flat or acute with one vertical side. Calices are minute and evenly spaced at an interval of 1mm. Septo-costae are arranged in two alternating orders, always granulated and may be wavy or crenellated in some colonies. Columella is absent or rudimentary.

Living colonies are grey, pale or dark brown, often with paler margins.

Ecology

Found in all reef habitats, more common on lower reef slopes where it sometimes forms large assemblages.

Occurrence

All reef areas in Taiwan.

Distribution

Widely distributed throughout the Indo-Pacific, from the Red Sea and along east Africa to French Polynesia.

Remarks

Colonies from biotopes with low illumination are very thin with low, flat carinae. Colonies from more exposed biotopes are thicker with high, asymmetrical carinae.

A large colony on lower reef slope (Nanwan).

A close-up view showing carinae.

Family Euphyllidae Veron, 2000

This family includes three extant genera according to molecular phylogenetic analyses, *Euphyllia*, which traditionally belonged to Family Caryophylliidae; *Galaxea*, and *Acrhelia*, which traditionally belonged to Family Oculinidae. However, the taxonomic status, common morphological features, and the phylogenetic relationships among these genera of this family have yet to be clarified.

All Euphyllidae species are colonial, with exsert septa and septal margins are smooth or ornamented with fine denticles. Columellae are absent or very weakly developed. However, colony morphology differs much between the genera. *Galaxea* species are plocoid, encrusting, submassive or columnar; *Acrhelia*, a monospecific genus, is ramose; and *Euphyllia* species are flabellate and hemispherical. Polyps of *Galaxea* and *Acrhelia* are translucent with white tentacle tips, surrounding the septa in a crown-like pattern. Species of *Euphyllia* are easily recognized by their long, tubular tentacles with globular or anchor-like tips, and large, widely spaced, very exsert septa.

Members of Euphyllidae may be found in all type of reef environments, but more commonly occur in protected reef environments; except for *Acrhelia*, which is only found in lagoons.

Simplified key to genera of Euphyllidae

Colonies ramose ..... *Acrhelia*
Colonies encrusting or submmasive
Colonies plocoid ..... *Galaxea*
Colonies flabellate to phaceloid ..... *Euphyllia*

Two color forms of *Euphyllia glabrescens.*

A hemispherical colony of *Euphyllia ancora.*

Euphyllia ancora Veron & Pichon, 1980

Chinese Name 腎形真葉珊瑚
Family Euphyllidae
Publication *Euphyllia ancora* Veron & Pichon (1980)
Synonymy *Euphyllia ancora* Veron (1986); Nishihira & Veron (1995); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are flabelloid with an initial crescent form from which irregular branches develop when colony size is small; and becoming flabello-meandroid and dome-shaped with long sinuous to straight valleys as size increases. Septal structures are variable, associated with the colony size and the environmental conditions. Septa of large colonies and those from turbid biotopes are usually arranged in three orders, small, regular, and slightly exsert. Septa from small colonies and those from more exposed biotopes are irregular with indistinguishable orders; some may be exsert up to 1cm while others are only fine ridges. The larger septa extend to the valley/calice center where they plunge near vertically. All septa are glabrous or finely dentate, with septal margins finely serrate. No columella is formed.

Polyps are large and fleshy, with tentacles which extend day and night. Tentacles are large and tubular that only branch at the base. Tentacles are retractable, with tips that are kidney-, anchor-, hammer-, or T-shaped. The tentacles are blue-grey to orange, with cream or pale green outer borders.

Ecology

Found in many reef environments, most often occur in shallow environments exposed to moderated wave action.

Occurrence

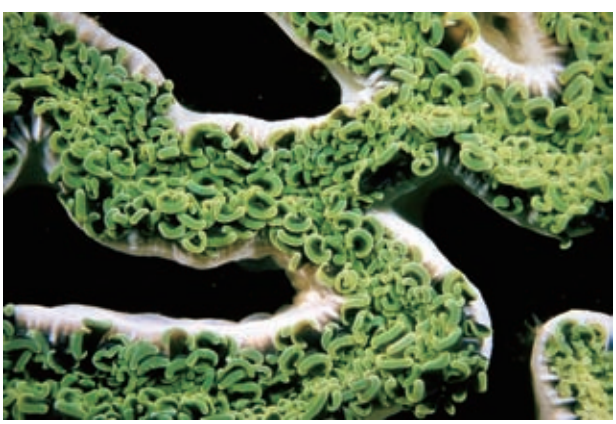
All reef areas around Taiwan.

Distribution

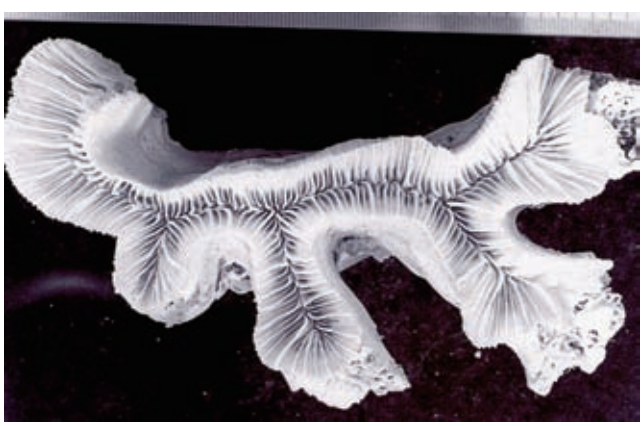
Distributed throughout the Indo-Pacific, from the Maldives to Papua New Guinea and the Great Barrier Reef.

Remarks

This species has identical skeleton with *E. divisa*, but with distinctive tentacles.



A close-up view showing tentacles and skeleton.



The flabello-meandroid skeleton. (x 0.5)

Euphyllia paraancora Veron, 1990

Chinese Name 擬腎形真葉珊瑚
Family Euphyllidae
Publication *Euphyllia paraancora* Veron (1990)
Synonymy *Euphyllia paraancora* Veron (2000)

Taxonomic Description & Diagnosis

Large colonies are usually phaceloid with infrequent branching. Corallites are 20-40 mm in diameter. Septa are thin, usually arranged in four orders, with septa of the first two orders more exsert and almost reaching the calice center where they plunge vertically. No columella is formed. Costae are poorly developed, usually form only fine striations.

Polyps are expanded day and night obscuring the underlying skeletal structures. Tentacles are tubular and retractable, with anchor-shaped ends, and tentacle tips often form concentric circles. They are usually pale tan or greenish-brown.

Ecology

Found in reef environments protected from wave action.

Occurrence

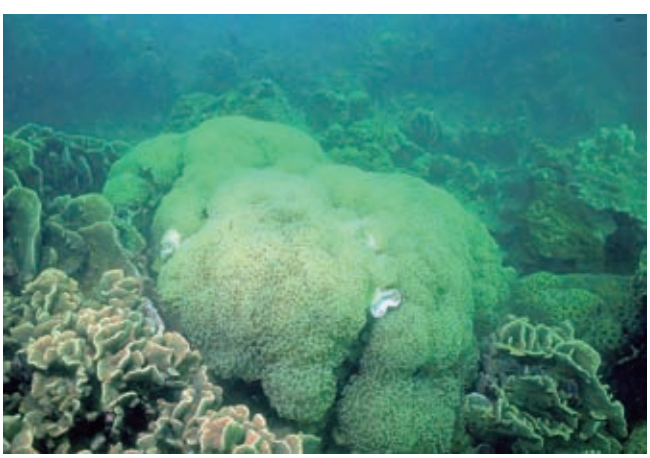
Found only in the Inner Bay of Chinwan, Penghu Islands, Nanwan Bay and Ludao.

Distribution

Mainly distributed in the west Pacific, west from the Indonesian Archipelago to New Caledonia.

Remarks

This species is similar to *Euphyllia glabrescens* and *E. paraglabrescens*, which are only distinguished from each other by the characters of polyp tentacles.



A large colony of *Euphyllia paraancora* (Chinwan, Penghu).

Anchor-shaped tentacle ends.

Euphyllia cristata Chevalier, 1971

Chinese Name 聯合真葉珊瑚
Family Euphyllidae
Publication *Euphyllia cristata* Chevalier (1971)
Synonymy *Euphyllia cristata* Chevalier (1971); Veron & Pichon (1982); Nishihira & Veron (1995); Veron (2000)

A dome-shaped colony of *Euphyllia cristata.*

Taxonomic Description & Diagnosis

Colonies are phaceloid and usually dome-shaped, with a diameter of less than 12 cm. Branches have one to three centers, with corallites 20-40 mm in diameter. The distances between branches are relatively uniform, averaging 4-8 mm, thus the branches have a compact appearance. Septa are usually arranged in five orders, which may be irregular and indistinct in some colonies. Primary septa are up to 4mm exsert, and extend inward almost to the calice center, outward above and beyond the thecae. Septa are reduced with increasing orders, thus the fifth order usually appears as fine ridges. Septal margins are finely serrated, and sides are glabrous or very finely granulated. Costae of the first three orders are usually well developed, the first order sometimes being prominent with lobes or spines.

Polyps have large, tubular, and retractable tentacles with knob-like ends, which are expanded day and night. Tentacles are pale grey or green, with distinctly colored tips, such as pale orange, yellow or cream.

Ecology

Found in most shallow reef environments.

Occurrence

Kenting National Park, Ludao, Lanyu, Xiaoliuchiu, Penghu Islands

Distribution

Widely distributed throughout the west Pacific, from the Indonesian Archipelago to Okinawa, Marshall Islands and Samoa.

Remarks

This species is similar to *Euphyllia glabrescens*, the former is distinguished by more compact branches with more exsert septa. Tentacles are usually larger in the former.

Tubular tentacles with distinct tips.

A close-up view showing exsert septa.

Euphyllia glabrescens (Chamisso & Eysenhardt, 1821)

Chinese Name 束形真葉珊瑚
Family Euphyllidae
Publication *Caryophyllia glabrescens* Chamisso & Eysenhardt (1821)
Synonymy *Euphyllia glabrescens* Vaughan (1918); Yabe et al. (1936); Crossland (1952); Wells (1954); Ma (1959); Chevalier (1971); Scheer & Pillai (1974); Veron & Pichon (1980); Veron (1986); Nishihira & Veron (1995); Veron (2000)
Euphyllia turgida Ma (1959)
Euphyllia rugosa Ma (1959)

Taxonomic Description & Diagnosis

Large colonies are usually phaceloid with infrequent branching; small ones are often phaceloflabellate, due to its relatively large growing surface with many centers. Branches immediately after branching have a diameter of 13-31 mm, the distance in between averages 7-16 mm, irrespectively of the size of the colony. Septa are usually arranged in four orders, with septa of the first two orders more exsert and almost reaching the calice center where they plunge vertically. All septa are finely granulated, with very thin wall on the upper margin. No columella is formed

Polyps are expanded day and night obscuring the underlying skeletal structures. Tentacles are straight, tubular and retractable, radiating from the polyps, with knob-like tips. Tentacles are usually grey-blue or grey-green with tips white, cream or pink.

Ecology

Occupies a wide range of reef environments.

Occurrence

Most reef areas in Taiwan except in northern and northeastern Taiwan.

Distribution

Widely distributed throughout the Indo-Pacific, from the Red Sea and east Africa to Marshall Islands and Fiji.

Remarks

The branching patterns, such as branching frequency, the space between branches and diameter of branches are different among colonies from different environments. This species is closely resembles *Euphyllia paraglabrescens*, the two are easily distinguished by their difference in tentacle forms.

A colony of *Euphyllia glabrescens* (Ludao).

Tentacles of *Euphyllia glabrescens.*

Euphyllia paraglabrescens (Veron, 1990)

Chinese Name 擬束形真葉珊瑚
Family Euphyllidae
Publication *Euphyllia paraglabrescens* Veron (1990)
Synonymy *Euphyllia paraglabrescens* Nishihira & Veron (1995); Veron (2000)

Taxonomic Description & Diagnosis

Large colonies are usually phaceloid to phaceloflabellate. Septa are thin and usually arranged in four orders, with septa of the first two orders more exsert and reaching the calice center where they plunge steeply. No columella is formed. Costae may form fine striations, or prominent and lobate.

Polyps are expanded day and night obscuring the underlying skeletal structures. Tentacles are short, bubble-like and retractable. Tentacles are usually grey or green.

Ecology

This species has only been found attached to sandstone rock in shallow water. Due to its rareness, not much information as to which habitats they prefer is known.

Occurrence

Nanwan Bay in Kenting National Park.

Distribution

Only known to occur in Taiwan and Japan.

Remarks

This species is similar to *Euphyllia glabrescens* with almost identical skeletal structures, but the two are easily distinguished by the characters of polyp tentacles.

A large colony of *Euphyllia paraglabrescens* (Ludao).

A close-up view showing retracted tentacles and exsert septa.

Galaxea fascicularis (Linnaeus, 1767)

Chinese Name 叢生棘杯珊瑚
Family Euphyllidae
Publication *Madrepora fascicularis* Linnaeus (1767)
Synonymy *Galaxea fascicularis* (Linnaeus); Vaughan (1918); Yabe et al. (1936); Crossland (1952); Nemenzo (1959); Ma (1959); Chevalier (1971); Scheer & Pillai (1974); Veron & Pichon (1980); Veron (1986); Nishihira & Veron (1995); Veron (2000)

A dome-shaped colony of *Galaxea fascicularis* (Nanwan).

Taxonomic Description & Diagnosis

Colonies display a wide variety of growth forms associated with the environments they occur, may be massive, dome-shaped, sub-digitate, columnar, encrusting or laminar. Large colonies frequently exceed 5 m across and 2 m in height, often with columns of less than 10 cm in diameter. Corallites are tubular, with irregular outlines depending on how densely packed they are, and are usually less than 10 mm in diameter. Septa are usually arranged in four orders, the first two orders being very exsert and irregularly contorted. Columella is poorly developed or absent. Costae of the first two orders are unequal and prominent. All septa and costae are granulated on their sides and margins.

Living colonies from shallow waters with good illumination are usually brightly colored, such as green, red or brown; those from turbid waters are dull grey or brown. Tips of the tentacles are white.

Ecology

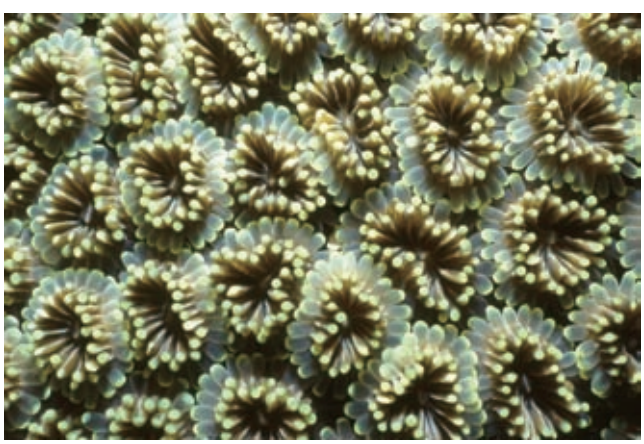
Found in most reef habitats, most often occur in protected biotopes not impacted by strong wave action.

Occurrence

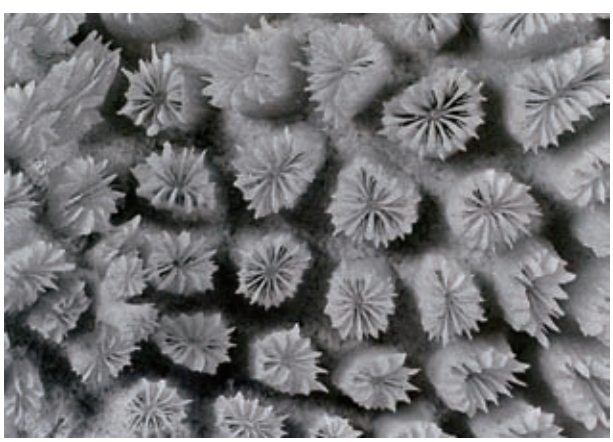
All reef areas in Taiwan.

Distribution

Widely distributed throughout the Indo-Pacific, from the Red Sea and east Africa to French Polynesia.



Corallites of *Galaxea fascicularis*.



Skeleton of *Galaxea fascicularis.* (x 1)

Galaxea astreata (Lamarck, 1816)

Chinese Name 星形棘杯珊瑚
Family Euphyllidae
Publication *Caryophyllia astreata* Lamarck (1816)
Synonymy *Galaxea musicalis* Yabe et al. (1936)
Galaxea clavus Vaughan (1918); Crossland (1952); Chevalier (1971)
Galaxea astreata Chevalier (1971); Veron & Pichon (1980); Veron (1986); Nishihira & Veron (1995); Veron (2000)

A large colony of *Galaxea astreata* (Dongsha).

Taxonomic Description & Diagnosis

Colonies are submassive, encrusting, columnar or laminar, usually less than 1 meter in diameter, but may exceed 2 meters in turbid habitats. Corallites are circular to oval, with a diameter of 3-4.5 mm, up to 3 mm exsert, and are usually 2-3.5 mm apart. Septa are arranged in three distinct orders, with the first two up to 2 mm exsert and being unequal. Tertiary septa are much shorter, less than half the calice radius. Usually 8-12 septa reach the corallites centers. Upper septal margins are smooth; septal sides are slightly granulated. Columella is small, composed of few septal dentations, or absent.

Living colonies are grey, green, pink or brown. Tentacles are translucent with white tips.

Ecology

Commonly found in reef biotopes protected from wave action.

Occurrence

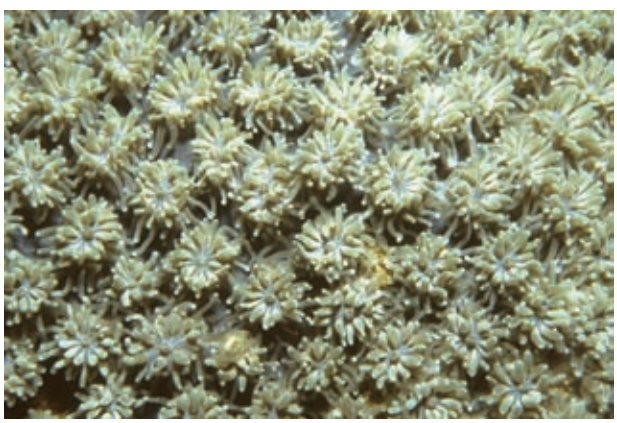
All reef areas in Taiwan.

Distribution

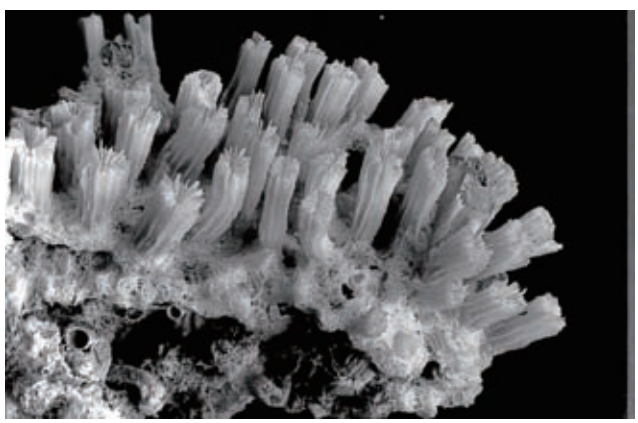
Widely distributed throughout the Indo-Pacific, from the Red Sea and east Africa to the Polynesia.

Remarks

This species is similar to *G. fascicularis*, the former is distinguished by its smaller corallites and less septa.



A close-up view showing corallites and tentacles.



Skeleton of *Galaxea astreata.* (x 1)

Acrhelia horrescens (Dana, 1846)

Chinese Name 刺枝珊瑚
Family Euphyllidae
Publication *Oculina horrescens* Dana (1846)
Synonymy *Acrhelia horrescens* (Dana); Vaughan (1918); Crossland (1952); Wells (1954); Nemenzo (1959); Chevalier (1971); Veron & Pichon (1980); Veron (1986); Nishihira & Veron (1995)

Taxonomic Description & Diagnosis

Colonies are usually arborescent, composed of dense and bushy or open and widely separated branches. Branches are mostly straight, with a diameter of 6-12 mm, bearing terminal corallites or a cluster of branch-end corallites. Corallites are tubular with thecae protruding up to 35 mm from the branches. Calices are very deep and thin walled with flaring rims. Septa are usually arranged in three cycles displaying a hexameral pattern. All septa are extremely exsert, with margins smooth and sides finely granulated. Columella is absent.

Living colonies are usually pale brown, yellow or green, sometimes with white branch ends. Tentacles of the polyps are tapering and translucent with white tips.

Ecology

Usually found in protected reef habitats or lagoons with good water circulation and light availability.

Occurrence

Found in the lagoon of Dongsha Atoll only.

Distribution

Mainly distributed throughout the Pacific, from the Indonesian Archipelago to Marshall Islands and Samoa.

Remarks

Branching becomes increasingly lax as the water depth increases.

A colony of *Acrhelia horrescens* (Dongsha).

The skeleton and corallites of *Acrhelia horrescens*.

Family Dendrophylliidae Gray 1847

This family comprises mostly ahermatypic genera and only three hermatypic genera. The brightly colored *Tubastraea*, a member of this family, is ahermatypic. They usually occur in deep sea, but may also be found in coral reef environments. Of the hermatypic genera, only genus *Turbinaria* is found in Taiwan.

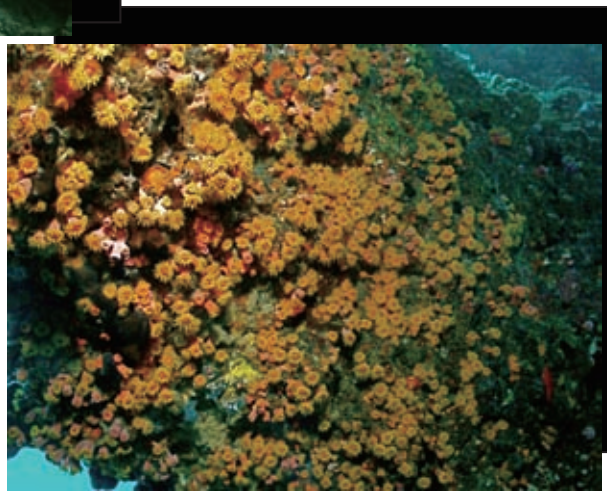
The two genera of Dendrophyllidae are both colonial. Species of *Turbinaria* are foliaceous to thick plates, and often form large colonies and extensive stands. Species of *Tubastraea* are submassive to ramose. Although *Turbinaria* and *Tubastarea* appear dissimilar, they are grouped together due to their septal arrangement, which is in accordance with the Pourtalès plan at least during the immature stage. Also in common are their thick, synapticulothecal corallite walls and extensive coenosteum, both of which are highly porous.

Members of *Turbinaria* are widely distributed throughout the world's coral reef environments, and are common in turbid reef areas. Species of *Tubastraea* are also widely distributed, and since they are azooxanthellate, they may be found in areas with poor illumination, such as crevices and overhangs in shallow waters and on the surface of hard substrate in deep waters.

Simplified key to genera of Dendrophylliidae

Colonies encrusting to foliaceous, zooxanthellate ..... *Turbinaria*
Colonies submassive to ramose, azooxanthellate ..... *Tubastraea*

Foliaceous colonies of *Turbinaria.*



Tubastraea colonies growing on overhangs.

Turbinaria frondens (Dana, 1846)

Chinese Name 葉形盤珊瑚
Family Dendrophylliidae
Publication *Gemmipora frondens* Dana (1846)
Synonymy *Turbinaria frondens* Crossland (1952); Nemenzo (1962); Veron & Pichon (1980); Veron (1986); Nishihira & Veron (1995); Veron (2000)
Turbinaria danae Wells (1955); Ma (1959)
Turbinaria contorta Eguchi (1938, 1968); Yabe & Sugiyama (1941); Ma (1959); Utinomi (1965)
Turbinaria rugosa Yabe & Sugiyama (1941); Ma (1959); Eguchi (1968)
Turbinaria foliosa Yabe & Sugiyama (1941); Nemenzo (1962)

Taxonomic Description & Diagnosis

Colonies may be encrusting, massive, foliaceous, columnar or cup-shaped. Small colonies are usually cup-shaped and foliaceous, but large ones, frequently exceeding 4 m across, may be composed of several of the above forms. Corallites of cup-shaped colonies are regularly spaced, inclined towards the margins of the unifacial fronds. They are conical, regularly protuberant, with calices of 1.5-2.5 mm in diameter. Where colony surface is irregular, corallites protrude up to 2.5 cm on convex surfaces, become small, crowded and immersed on concave surfaces, with calices of 1-3 mm in diameter. 18-33 septa of one order extend inwards 1/4 to 1/3 the calice radius, and are not exsert. Columella may be elliptical, rounded, hemispherical domes, or spongy. Coenosteum appear spongy, which becomes reticulated or striated on corallite walls.

Living colonies are usually grey to dark brown, sometimes with shades of green or yellow.

Ecology

Common in most environments, especially protected, turbid biotopes, such as shallow reefs and rocky foreshores. Budding normally occurs at colony margins.

Occurrence

Reef areas along southern and eastern coast of Taiwan, Penghu Islands, Dongsha Atoll, and Ludao.

Distribution

Widely distributed throughout the Indo-Pacific, from east Africa to French Polynesia.

Remarks

This species is similar to *T. mesenterina*, but the latter is distinguished by their smaller corallites and septa arranged in two or three orders.

A large colony of *Turbinaria frondens* (Penghu).

Conical corallites of *Turbinaria frondens*.

Turbinaria mesenterina (Lamarck, 1816)

Chinese Name 膜形盤珊瑚
Family Dendrophylliidae
Publication *Explanaria mesenterina* Lamarck (1816)
Synonymy *Turbinaria mesenterina* Crossland (1941); Veron & Pichon (1980); Veron (1986); Nishihira & Veron (1995); Veron (2000)
Turbinaria tubifera Yabe & Sugiyama (1941); Ma (1959)
Turbinaria venusta Ma (1959)

Taxonomic Description & Diagnosis

Colonies are foliaceous, composed of unifacial laminae, which are highly contorted forming upright, irregular tubes in intertidal biotopes, are tiered and convoluted on upper reef slopes, and flat or form horizontal whorls in biotopes with reduced light. Corallites are protuberant and strongly inclined towards a vertical direction, except on concave surface where corallites become submerged. Calices are circular, with a diameter of 1.3-2.0 mm. In intertidal biotopes, corallites are relatively large, thick walled, and conical, with calices of roughly 1.7 mm in diameter; corallites become tubular and protrude up to 3 mm on upper reef slopes. In turbid or shaded biotopes, corallites are fine, tubular, with little protuberance. Septa are in three orders, the first two being equal or subequal, and the third reduced to absent. Major septa extend inwards 1/3-2/3R. Septa are all granulated. Columella is usually elliptical, spongy and protuberant, or may be a simple vertical ridge. Coenosteum is porous.

Living colonies are usually uniform pale grey-green or grey-brown. Polyps are usually white.

Ecology

Common in most environments, may dominate shallow, turbid biotopes.

Occurrence

All reef areas around Taiwan and offshore islets, but rare in northern Taiwan.

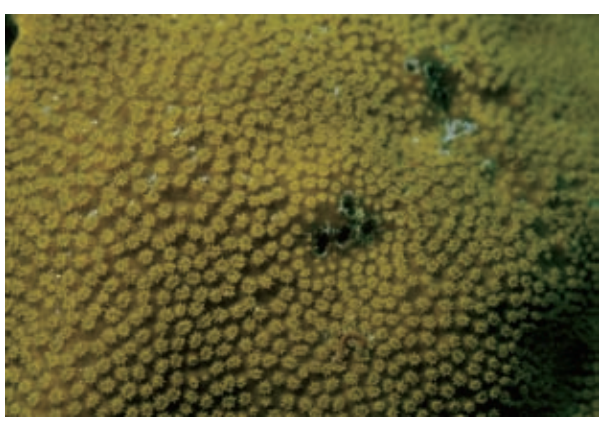
Distribution

Widely distributed throughout the Indo-Pacific, from the Red Sea and East Africa, to French Polynesia.

Remarks

This species is similar to *T. frondens*, but the latter is distinguished by their larger corallites and septa of one order. It is also similar to *T. reniformis*, but the latter is usually less convoluted, with more compact, immersed corallites.

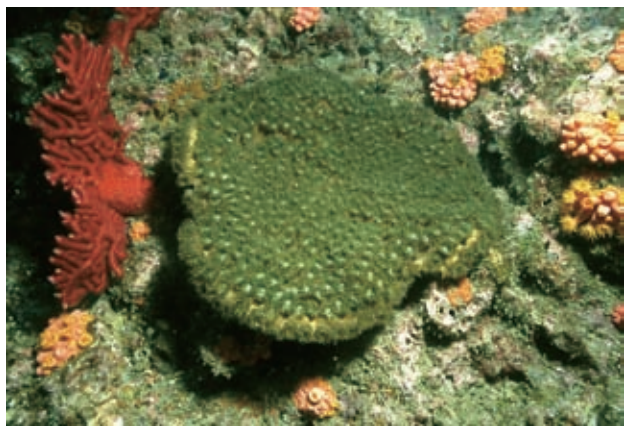
A foliaceous colony of *Turbinaria mesenterina*.



A close-up view showing polyps.

Turbinaria peltata (Esper, 1794)

Chinese Name 盾形盤珊瑚
Family Dendrophylliidae
Publication *Madrepora peltata* Esper (1794)
Synonymy *Turbinaria peltata* Eguchi (1938); Crossland (1952); Wells (1955); Ma (1959); Utinomi (1965, 1971); Scheer & Pillai (1974); Veron & Pichon (1980); Veron (1986); Nishihira & Veron (1995); Veron (2000)



A plate-like colony of *Turbinaria peltata* (Nanwan).

Taxonomic Description & Diagnosis

Colonies are encrusting to foliaceous, the horizontal laminar plates are greatly thickened, and often forming overlapping tiers as colonies reaches several meters in diameter. The upper surface of the unifacial plates may develop into ridges, and subsequently into bifacial fronds or cylindrical columns. Corallites are dispersed to crowded, immersed towards the colony center, and protrude more on convex surface and near colony margins. They may protrude up to 2.5 cm, and inclined towards colony margins. Calices are circular, with a diameter of 3-5 mm. Septa are arranged in three orders, projects inwards 1/4-1/2R, the third cycle being reduced or absent. Septa are all granulated. Columella is dome-shaped and spongy, or with a compact, central plate.

Living colonies are usually grey or brown.

Ecology

Common in most environments, especially protected, turbid biotopes, such as shallow rocky foreshores and shallow reef slopes. Budding is extratentacular. Polyps are extended during the day, with thick tentacles up to 1 cm in length.

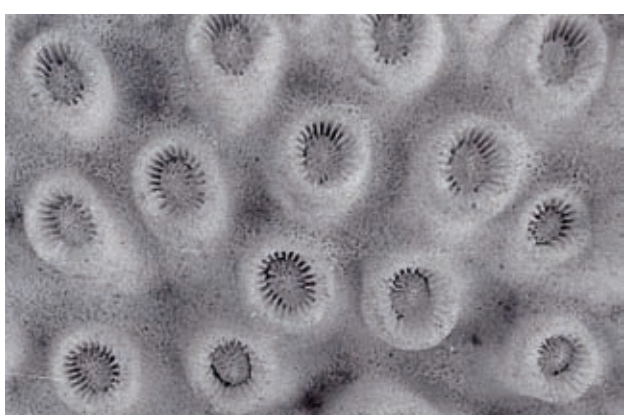
Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

Widely distributed throughout the Indo-Pacific, from East Africa to American Samoa.

Polyps of *Turbinaria peltata.*



Corallites of *Turbinaria peltata.* (x 2)

Turbinaria reniformis Bernard, 1896

Chinese Name 腎形盤珊瑚
Family Dendrophylliidae
Publication *Turbinaria reniformis* Bernard (1896)
Synonymy *Turbinaria reniformis* Veron & Pichon (1980); Veron (1986); Nishihira & Veron (1995); Veron (2000)
Turbinaria sp. cf. *T. veluta* Wells (1954); Scheer & Pillai (1974)

Taxonomic Description & Diagnosis

Colonies are encrusting or foliaceous, composed of unifacial laminae, which may be flat, curved, contorted or forming tiers of plates as colonies reaches 5 m across. Corallites are usually widely spaced, but may also be crowded that they are almost in contact. Corallites are initially slightly protuberant, with small, deep calices. With subsequent growth, corallites become conical to immersed, thick-walled, with calices 1.5-2 mm in diameter. 12 septa are arranged in two equal or subequal orders, in some localities, up to 20 septa may be present. Septa are wedge-shaped, with inner margins fine and straight or slightly dentate, and are heavily granulated. Columella may be a elongate, vertical plate or a spongy dome.

Living colonies are usually yellow-green, with margins distinctly colored.

Ecology

Sometimes common in turbid environments and may form large stands.

Occurrence

All reef areas in Taiwan and offshore islets.

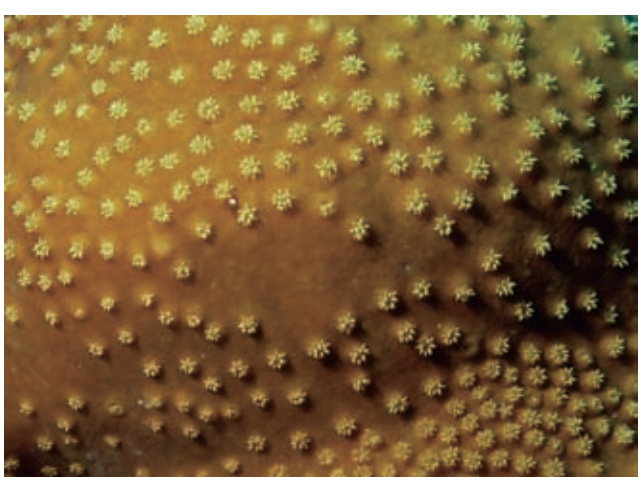
Distribution

Widely distributed throughout the Indo-Pacific, from the Red Sea and East Africa, to French Polynesia.

Remarks

This species is similar to *T. mesenterina*, but the latter is distinguished by their usually more convoluted appearance, with thinner, more tubular corallites, and a third order septa.

A foliaceous colony of *Turbinaria reniformis* (Penghu).



Polyps of *Turbinaria reniformis*.

Turbinaria stellulata (Lamarck, 1816)

Chinese Name 星形盤珊瑚
Family Dendrophylliidae
Publication *Astraea stellulata* Lamarck (1816)
Synonymy *Turbinaria stellulata* Yabe & Sugiyama (1941); Wells (1954); Ma (1959); Veron & Pichon (1980); Veron (1986); Nishihira & Veron (1995); Veron (2000)
Turbinaria stephensoni Crossland (1952); Nemenzo (1962)

Taxonomic Description & Diagnosis

Colonies are initially encrusting, consisting of only plates. With subsequent, repeated overgrowth of plate-like or subspherical expansions, colonies become massive and dome-shaped. Corallites are conical, protrude up to 2 cm, with a diameter of 3-4 mm. Calices are wide, approximately 2 mm in diameter. Septa may slope from the rim to the columella or have vertical inner margins. Septa are all granulated or spinulose, with finely dentate inner margins. Columella is circular to elliptical, and may be thin and elongate. Coenosteum is spongy.

Living colonies display a variety of colors, but are usually brown or green.

Ecology

Usually occurs on upper reef slopes and turbid waters.

Occurrence

All reef areas in Taiwan and offshore islets.

Distribution

Widely distributed throughout the Indo-Pacific, from Red Sea and East Africa, to Fiji.

Remarks

This species is similar to sub-glomerate colonies of *T. reniformis*, but the latter is distinguished by their thicker walled corallites with broad bases but relatively narrow calices, and septa (usually 12) with straight margins.

A encrusting colony of *Turbinaria stellulata* (Penghu).

A close-up view of *Turbinaria stellulata.*

Tubastraea aurea (Quoy & Gaimard, 1833)

Chinese Name 圓管星珊瑚
Family Dendrophylliidae
Publication *Lobophyllia aurea* Quoy & Gaimard (1833)
Synonymy *Lobophyllia aurea* Quoy & Gaimard (1833)
Tubastraea aurea Boschma, 1953; Eguchi, 1968

Taxonomic Description & Diagnosis

Colonies are encrusting or branching with short branches. Corallites are circular, plocoid to tubular, 20-30 mm exsert, with a diameter of 10-20 mm, and they are closely spaced. Calices are elliptical, 8-10 mm in diameter and 6-8 mm deep. Septa are arranged in four complete cycles, with the fourth cycle septa weakly developed and inconspicuous. Columella is large and spongy, with a diameter reaching 1/2R. Coenosteum is porous where it is devoid of corallites.

Living colonies are bright yellow.

Ecology

Occurs in most reef environments, especially on exposed rocks, vertical walls, overhangs and caves below 10 m. It is azooxanthellate, with tentacles extending all day.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

Widely distributed throughout the tropical and subtropical of the Indo-Pacific and the Atlantic, from 2-25 m in depth.

Remarks

This species may be confused with *T. coccinea* and *T. coccinea*. They are separated mainly by their corralites size. A systematic revision is needed for the genus *Tubastraea*.

A colony of *Tubastraea aurea* (Nanwan).

Polyps of *Tubastraea aurea.*

Tubastraea coccinea Lesson, 1829

Chinese Name 短管星珊瑚
Family Dendrophylliidae
Publication *Tubastraea coccinea* Lesson (1829)
Synonymy *Dendrophyllia manni* Vaughan (1907)
Tubastraea coccinea Eguchi (1968); Wells (1982); Cairns (1991)

Taxonomic Description & Diagnosis

Colonies are roughly spherical, plocoid, to phaceloid. Corallites are 10-13 mm in calicular diameter, up to 12 mm exsert, with elliptical calices, and unite basally. Septa are hexamerally arranged in four complete cycles. Primary and secondary septa are equal, not exsert, larger than higher cycle septa, with vertical and straight inner edges, and 12 reach the columella. Septa sides are finely granulated, appearing smooth. Third cycle septa are rudimentary, with inner edges laciniate. Fourth cycle septa are about the same size and shape as the third cycle ones, but in larger corallites, pairs of fourth cycle septa unite before adjacent third cycle ones, becoming a porous lamella extending towards the columella. Fossa is moderately deep. Columella is large and spongy. Costae equal, finely granulated, and separated by wide, porous intercostals grooves.

Living colonies are orange, yellow or red.

Ecology

Occurs in most reef environments, especially on exposed rocks, vertical walls, overhangs, and caves. It is azooxanthellate.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

Widely distributed throughout the tropical and subtropical reefs in Indo-Pacific and Atlantic.

Remarks

This species is similar to *Tubastraea faulkneri*, but the latter is distinguished by their widely spaced corallites sunken in thickened coenosteum and the prominent fusion of the fourth order septa to those of the third.

A plocoid colony of *Tubastraea coccinea*.

Polyps of *Tubastraea coccinea*.

Tubastraea faulkneri Wells, 1982

Chinese Name 福克納管星珊瑚
Family Dendrophylliidae
Publication *Tubastraea faulkneri* Wells (1982)
Synonymy *Tubastraea faulkneri* Cairns (1991)

Taxonomic Description & Diagnosis

Colonies are encrusting, becoming massive, hemispherical and strongly convex. Corallites are 3-8 mm exsert, 5-15 mm apart, and appear slightly sunken in coenosteum which is swollen between calices. Calices are 8-10 mm in diameter and 5-8 mm deep. Septa are arranged in four complete cycles. Primary septa are prominent, slightly thickened and exsert. Secondary septa thinner and rarely exsert. Inner margins of septa are vertical, dropping steeply, with 12-24 reaching the columella. Third cycle septa slopes to the columella, but barely reaching calices rims. Fourth cycle septa are weakly developed, incomplete, and irregularly fuse with those of the third cycle. Fossa is shallow. Columella is large, deep and spongy. Coenosteum is porous and vermiculate.

Living colonies are orange to yellow in color.

Ecology

Occurs in most reef environments, especially on exposed rocks, vertical walls, overhangs, and caves. It is azooxanthellate.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

Widely distributed throughout the tropical and subtropical of the Indo-Pacific and the Atlantic, from 2-25 m in depth.

Remarks

This species is similar to *Tubastraea coccinea*, but the latter is distinguished by their crowded corallites which are united basally and no fusion between the third and fourth cycle septa.

Exsert corallites of *Tubastraea faulkneri*.

Colonies of *Tubastraea faulkneri* growing on overhangs (Pengjiayu).

Tubastraea micrantha (Ehrenberg, 1834)

Chinese Name 黑管星珊瑚
Family Dendrophylliidae
Publication *Oculina micranthus* Ehrengberg (1834)
Synonymy *Dendrophyllia micranthus* Crossland (1952); Nemenzo (1960)
Tubastraea micranthus Scheer & Pillai (1983)

Taxonomic Description & Diagnosis

Colonies are dendroid, reaching over 1 m in height. Corallites are widely spaced on the surface of the branches. Corallite are plocoid to tubular, 10-12 mm exsert and 5-6 mm in diameter. Calices are circular, 4-5 mm deep. Septa are arranged in three cycles, with weakly developed columella. As with other species of Tubastraea, colonies are costate, with no epitheca. Porosity in the skeleton increases from colony base to branch tips.

Living colonies are dark olive-green, blackish purple or dark blue.

Ecology

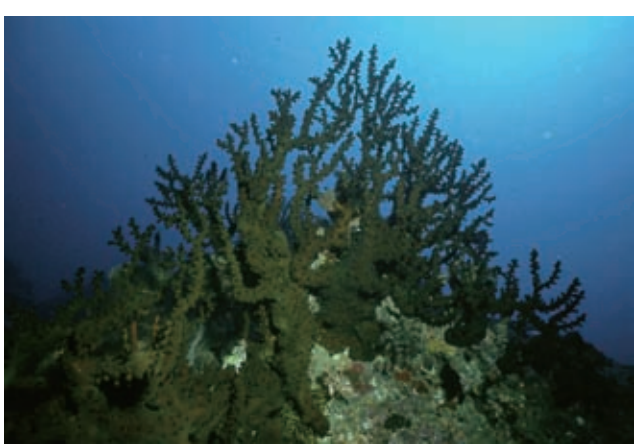
Occurs mostly in exposed reef environments, especially where the current is strong. Unlike other species of *Tubastraea*, *T. micrantha* is less often found in caves or other cryptic habitats, but may grow in well illuminated biotopes. It is azooxanthellate. Budding is extratentacular. Polyps expand at night.

Occurrence

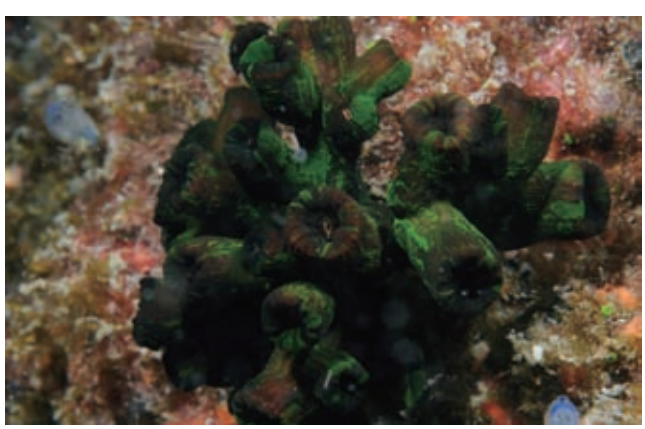
Southern Taiwan, Ludao, Lanyu, Dongsha Atoll.

Distribution

Widely distributed throughout the Indo-Pacific, from the Red Sea in the west to Fiji in the east.



A dendroid colony of *Tubastraea micrantha* (Nanwan).



Tubular corallites of *Tubastraea micrantha*.

Family Siderastreidae Vaughan & Wells, 1943

Family Siderastreidae may be one of the most ancient coral family, with many fossil species and a long history of fossil records. However, it is composed of only two extant genera *Siderastrea* and *Pseudosiderastrea*, with only fewextant species. Recent molecular analyses revealed that Indo-Pacific *Siderastrea* and Atlantic *Siderastrea* are very distantly related. In addition, genus *Psammocora* and genus *Coscinaraea* which were both included in Family Siderastreidae in traditional taxonomy, have shown closer phylogenetic relationships to species of the Family Fungiidae, thus they are now excluded herein.

Siderastreidae species are all colonial, usually massive or encrusting. They are essentially characterised by immersed corallites, with corallite walls formed by the thickening of the septo-costae. Septa are closely compacted but regularly spaced. The inner margins of septa tend to fuse, forming groups of confluent septa in a fan-like manner. Septal margins and sides are strongly granulated.

Simplified key to genera of Siderastreidae

Corallites polygonal, with thick walls ..... *Siderastrea*
Corallites polygonal, with thin walls ..... *Pseudosiderastrea*

Siderastrea colonies surrounded by macroalgae.

Siderastrea savignyana
Milne Edwards & Haime, 1850

Chinese Name 格狀絲珊瑚
Family Siderastreidae
Publication *Siderastrea savignyana* Milne Edwards & Haime (1850)
Synonymy *Siderastrea savignyana* Veron (1986); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are encrusting and thick, sometimes slightly dome-shaped, and may reach 1 m in diameter. Corallites are cerioid, shallow and polygonal, with a diameter of 2-4 mm. Up to 30-35 septa are neatly arranged and evenly spaced. The inner margins of septa are fused, forming groups of confluent septa, so that 10-15 fuse with the columella. Septal margins bear fine, saw-like dentations. All septal margins and sides are strongly granulated. Corallite walls are relatively thick, with fine ridges composed of a network of septa with cross linkages along their tops. Columella consists of a few pinnules.

Living colonies are pale tan and white, sometimes with dark centers.

Ecology

Occurs in shallow reef environments or sandy lagoons, but is uncommon. Colonies are commonly found to be partly embedded in sand. Budding is extratentacular.

Occurrence

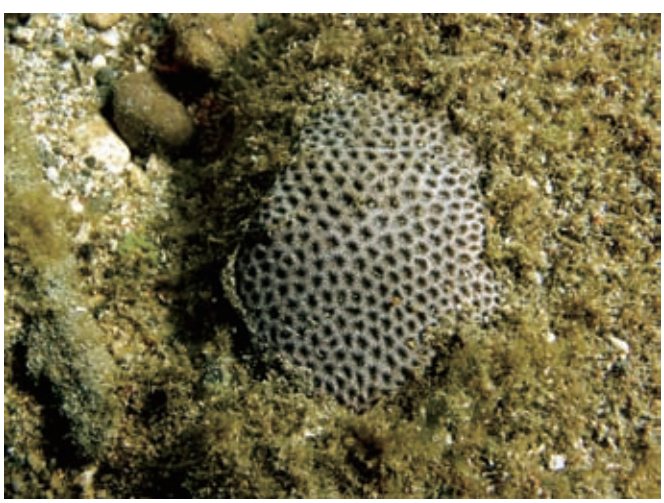
Wanlitung on the west coast of Hengchun Peninsula.

Distribution

Widely distributed throughout the Indo-Pacific, from east Africa to Fiji.

Remarks

This species is similar to *P. tayamai*, the latter being distinguished by their larger corallites, smaller colonies, thinner corallite walls, and the flattened dentations on septal margins which are perpendicular to the septa.



A colony of *Siderastrea savignyana* (at Wanlitung).

Cerioid corallites of *Siderastrea savignyana*

Pseudosiderastrea tayamai Yabe & Sugiyama, 1935

Chinese Name 擬絲珊瑚
Family Siderastreidae
Publication *Pseudosiderastrea tayamai* Yabe & Sugiyama (1935)
Synonymy *Pseudosiderastrea tayamai* Yabe et al. (1936); Veron & Pichon (1980); Veron (1986); Nishihira & Veron (1995); Veron (2000)
Anomastraea (Pseudosiderastrea) tayamai Wells (1956)

Taxonomic Description & Diagnosis

Colonies are encrusting and thick, sometimes slightly dome-shaped, and up to approximately 16 cm in maximum diameter. Corallites are cerioid, shallow and polygonal, with a diameter of 3-6 mm; but may be elongated sometimes in flat or concave parts of the colony. Up to 48 septa are arranged in four orders, the fourth order being abortive. Septa are evenly spaced and slightly exsert. Septa of higher orders tend to fuse with those of lower orders at their inner margins. Septal margins bear small, flattened dentations perpendicular to the septa. Septal sides are spinulose, with spines often arranged in rows of trabecular orientation. Corallite wall is thin and solid. A conspicuous axial fossa of 0.4-0.5 mm in diameter lies in the corallite center, from which several trabeculae project, forming 1-4 papillae, which develop into columella.

Living colonies are pale grey to brown, with white corallite walls.

Ecology

Usually occurs in very shallow water, attached to bare rock, but are uncommon. Budding is extratentacular.

Occurrence

Reef areas along southern and eastern Taiwan, but very rare.

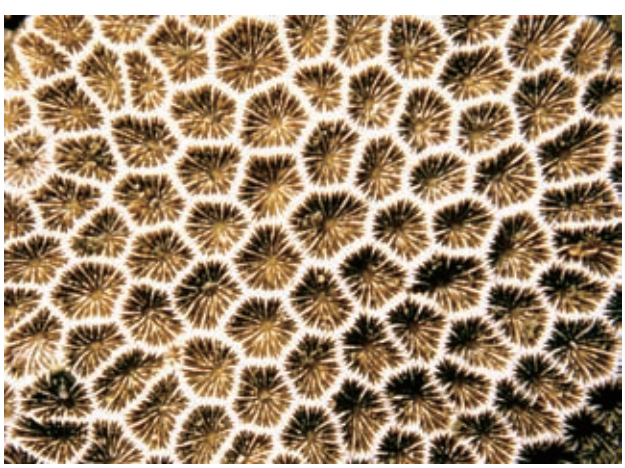
Distribution

Widely distributed throughout the Indo-Pacific, from Mozambique Channel to Fiji.

Remarks

This genus has only one species. This species is similar to *Siderastrea savignyana*, the latter being distinguished by their smaller corallites. It also resembles *Coscinaraea*, which does not have cerioid corallites; it resembles *Coeloseris*, but the latter has smooth septa with no columella; it also resembles *Leptastrea*, which has corallites separated by a groove.

An encrusting colony of *Pseudosiderastrea tayamai* (at Sanxiantai).



Cerioid corallites of *Pseudosiderastrea tayamai.* (x 1.8)

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