

Scleractinia Fauna of Taiwan

II. The Robust Group

台灣石珊瑚誌 II. 堅實類群

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Pocilloporidae Gray, 1842

Coral species of this family are colonial and mostly zooxanthellate. Colonies are submassive, ramose or arborescent. Corallites are immersed and small (< 2 mm in diameter), have one or two cycles of septa and columella. Septa are often poorly developed and appeared as narrow laminae, striae or spines. Some septa are fused with the styliform columella. Coenosteum is covered with spinules.

The Pocilloporidae basically contains five genera: *Madracis*, *Palauastrea*, *Pocillopora*, *Seriatopora* and *Stylophora*. However, *Madracis* and *Palauastrea* have been moved to Astrocoeniidae by Veron (2000). This reflects that the phylogenetic status of Pocilloporidae and Astrocoeniidae is uncertain.

Molecular phylogenetic studies based on mitochondria genes revealed a sequential divergence among the five genera, i.e., *Stylocoeniella*, *Madracis*, *Pocillopora*, *Seriatopora* and *Stylophora*, but did not support the two groups or sister-clades relationship (Chen, 2008; Fukami et al. 2008). Molecular dating of mitogenomic phylogenies agreed well with the evidence of fossil records. The *Stylocoeniella* located at the basal clade represents the earliest divergence within this family. The divergence of *Madracis* occurred about 76 Ma during late Cretaceous. The following divergence between *Seriatopora* and *Stylophora* was about 15.6 Ma during the Miocene. Therefore, it is suggested that the Pocilloporidae Gray, 1842 takes the priority over Astrocoeniidae Koby, 1889, and includes six genera: *Madracis*, *Palauastrea*, *Pocillopora*, *Seriatopora*, *Stylocoeniella* and *Stylophora*. Among them, *Madracis* and *Palauastrea* have not been recorded from Taiwan.

Simplified key to genera of Pocilloporidae

- Coral colonies are massive, columnar or encrusting** *Stylocoeniella*
- Coral colonies are mainly branching**
 - Colonies covered with verrucae, septa rudimentary *Pocillopora*
 - Colonies without verrucae
 - Branches thin, anastomosing, corallites in rows *Seriatopora*
 - Branches thicker, corallites with hoods but not in rows *Stylophora*



The pocilloporids are common pioneer corals on new substrate.



A branching colony of *Seriatopora hystrix*.

Pocillopora damicornis (Linnaeus, 1758)

Chinese Name	細枝鹿角珊瑚
Family	Pocilloporidae
Publication	<i>Millepora damicornis</i> Linnaeus (1758)
Synonymy	<i>Pocillopora caespitosa</i> Yabe et al. (1936); Crossland (1952) <i>Pocillopora damicornis</i> Vaughan (1918); Wells (1954); Scheer and Pillai (1976); Veron and Pichon (1976); Dai (1989); Veron (1986); Nishihira and Veron (1995); Veron (2000)
Specimen	TUIO-C-146, 501-508, 522 (Nanwan Bay), 513-516 (Penghu); ASIZ-5509-5511 (Nanwan Bay), 5512 (Lanyu), 5513 (Xiaoliuchiu); SYUMB: PG-04; NMNS-000048-3001-3125 (Oluanpi and Lanyu)

Taxonomic description and diagnosis

Colonies are cespitose with main branches round at the base and digitiform or expanded at the distal tips. Colony growth form is highly variable and has been suggested to be related to habitats. Colonies from exposed reefs are compact with main branches close together resulting in spherical massive forms. Colonies from turbid or protected environments have thinner, elongated branches.

Verrucae are irregular and scattered. Calices are about 1.0 mm in diameter and ceriod. Calices are often lack of internal structures, but may have rudiments of two cycles of septa and a low boss columella.

Living colonies are usually pale brown, greenish, or pink.

Ecology

Occurs in most shallow water habitats, often found on newly established substrate such as floating logs, wharf piles, buoy chains, and artificial substrata, thus they are one of the first colonizers on coral reefs.

Occurrence

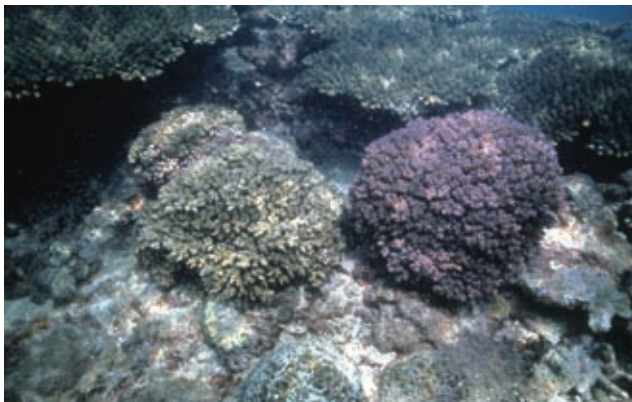
All reef areas around Taiwan and offshore islets, but rare in northern reefs.

Distribution

Widely distributed throughout the Indo-Pacific, from east Africa to west coasts of Central to South America.

Remarks

This species is distinguished from other *Pocillopora* species by its lack of true verrucae. However, it is often difficult to delimit a 'true verrucae' since verrucae may be totally devoid, or may have a variety of shapes ranging from short to long and thin acute protuberances..



Two color forms of *Pocillopora damicornis*.



A close view of branch tips with small polyps.

Pocillopora verrucosa (Ellis and Solander, 1786)

Chinese Name	疣鹿角珊瑚
Family	Pocilloporidae
Synonymy	<i>Pocillopora verrucosa</i> Vaughan (1918); Yabe et al. (1936); Veron & Pichon (1976); Dai (1989); Veron (1986); Nishihira & Veron (1995); Veron (2000) <i>Pocillopora elegans</i> Vaughan (1918); Wells (1954); Nemenzo (1964); Veron (2000) <i>Pocillopora ligulata</i> Vaughen (1907); Yabe et al. (1936); Wells (1954); Veron (2000) <i>Pocillopora danae</i> Vaughan (1918); Crossland (1952); Nemenzo (1964); Veron (2000)
Specimen	TUIO-C-016, 058, 060, 061, 117, 121, 154, 190, 239, 245, 509 (Nanwan Bay), 064, 447 (Xiaoliuchiu), 517-519 (Penghu); ASIZ-5501, 5503-5508, 5516, 5517 (Nanwan Bay), 5502 (Lanyu), 5518 (Wanlitung); SYUMB: NA-22 (Nanwan Bay); NMNS-000048-3126-3189 (Oluanpi and Lanyu)

Taxonomic description and diagnosis

Colonies are ramose and composed of uniform upright branches which often result in bushy clumps. Main branches of a colony often have similar size and shape. Branches are heavily verrucate over the tips. Verrucae are prominent, and are 3-7 mm in diameter and 2-6 mm in height which give the colony a rough or ragged surface. Verrucae are irregular in shapes, may be conical, tapered or rounded. Lateral verrucae often incline toward the distal ends of branches. Verrucae are scattered and form low-domed protuberances when nearing the base of branches.

Calices are 0.5-1.0 mm in diameter. Calices are polygonal and circular in shapes, respectively, in the distal and in basal parts of branches. Septa vary from simple vertical ridges covered by fine denticles to vertical rows of sharp spines projecting toward columella. Columella is absent or a low boss.

Living colonies are usually pale brown, pink, or blue.

Ecology

Occurs in most shallow reef environments, common in exposed shallow waters.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

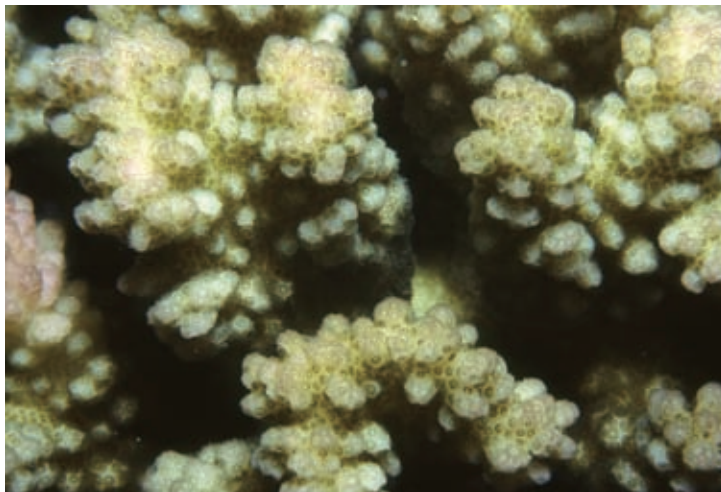
Widely distributed throughout the Indo-Pacific, from east Africa to west coasts of Central to South America.

Remarks

This species is similar to *P. meandrina*, but the latter has shorter, more flattened branches and smaller verrucae. However, colony growth form of this species is highly variable and has been suggested to be related to habitat. Colonies tend to continuously expand the distal ends of branches in one plane without dividing in the exposed environment. Colonies from protected environments have thinner, irregular, mostly prostrate branches.



A ramose colony of *Pocillopora verrucosa*..



A close view showing the verrucae and polyps.



Pocillopora verrucosa (pink) and two colonies of *P. meandrina* (yellow).

Pocillopora meandrina Dana, 1846

Chinese Name	紋形鹿角珊瑚
Family	Pocilloporidae
Publication	<i>Pocillopora meandrina</i> Dana (1846)
Synonymy	<i>Pocillopora meandrina</i> Vaughan (1918); Yabe et al. (1936); Nemenzo (1964); Scheer and Pillai (1974); Dai (1989); Veron (1986); Nishihira & Veron (1995); Veron (2000)
Specimen	TUIO-C-007, 042, 062, 088, 161, 325 (Nanwan Bay), 447, 520, 521 (Xiaoliuchiu); SYUMB: NA-23 (Nanwan Bay); NMNS-000048-3190-3202 (Oluanpi and Lanyu)

Taxonomic description and diagnosis

Colonies are ramose with hemispherical-clumping shapes standing on broad bases. Branches are narrow at base, 10-25 mm in diameter and tend to be expanded, flattened and sinuous at apex, with 25-55 mm in width. Branches are often evenly spaced and giving rise to a uniform appearance. Verrucae are smaller than those of *P. verrucosa*. Lateral verrucae averages 2.5 mm in diameter and 3.0 mm in height. Calices are 1.0 mm in diameter and ceriod. Apical calices and those on the verrucae are polygonal in shape and crowded. Septa and columella are absent or rudimentary.

Living colonies are green, cream or pink.

Ecology

Occurs in shallow reef environments, especially common in shallow exposed reef areas from 0-5 m in depth.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

Widely distributed throughout the Indo-Pacific, from east Africa to west coasts of Central to South America.

Remarks

Corallum growth forms of this species are intermediate between those of *P. eydouxi* and *P. verrucosa*. It was considered a valid species by Dai (1989) and Veron (2000), since its flattened and sinuous branches are conspicuous and consistent. However, results of phylogenetic analyses suggested that delineation of species boundaries among *P. eydouxi*, *P. meandrina* and *P. verrucosa* was yet verified.



A ramose colony of *Pocillopora meandrina*.



A close view of flattened apex with verrucae.

Pocillopora eydouxi Milne Edwards & Haime, 1860

Chinese Name	巨枝鹿角珊瑚
Family	Pocilloporidae
Publication	<i>Pocillopora eydouxi</i> Milne Edwards & Haime (1860)
Synonymy	<i>Pocillipora eydouxi</i> Vaughen (1918); Yabe et al.(1936); Crossland (1952); Wells (1954); Nemenzo (1971); Scheer & Pillai (1974); Veron and Pichon (1976); Dai (1989); Veron (1986); Nishihira and Veron (1995); Veron (2000) <i>Pocillopora modumanensis</i> Vaughan (1907); Yabe et al. (1936); Nemenzo (1964)
Specimen	TUIO-C-059 (Xiaoliuchiu), 147, 444, 522 (Nanwan Bay), 523, 524 (Penghu); NMNS-000048-3203-3228 (Oluanpi and Lanyu)

Taxonomic description and diagnosis

Colonies are ramose and composed of stout, upright, flattened and elongate branches, may reach 1 m across. Branching occurs infrequently and branches are much larger in all dimensions than those of other species of the genera. Major branches are cylindrical, 2.5-4.5 cm in diameter in the basal part, and tend to be broadened and flattened near the distal ends. Verrucae are 1.5-2.5 mm in height and 2.0-3.0 mm in diameter, which are taller and more erect than those of *P. verrucosa*. Verrucae are evenly distributed throughout the surface of branches except at the apex where the verrucae are often lacking.

Calices near the top of branches are cellular, deep, without any internal structure, but those locating a few centimeters below the top are complex with fine denticles covering the columella and septa. These calices usually have two unequal cycles of septa with primary septa extending toward the pinnacle-like columella. One or a pair of directive septa are sometimes dominant and are jointed to a pinnacle-like columella. Septal edges are irregularly toothed. Less complex calices may have one cycle or an irregular number of septa and a columella. Older calices near the base are devoid of internal structures, but are well developed when on verrucae. Thecal walls of calices on verrucae are raised and support a row of spinules which are continuous with granulations on the coenosteum.

Living colonies varies from deep green, brown to pale pink.

Ecology

Occurs in most reef environments, especially on reef areas exposed to strong or moderate wave or current action and rarely found in turbid waters and protected reefs.

Occurrence

All reef areas around Taiwan and offshore islets, but rare in northern reefs.

Distribution

Widely distributed throughout the Indo-Pacific, from east Africa, to west coasts of Central to South America.

Remarks

This species is similar to *P. woodjonesi*, but the latter usually has shorter and more compacted branches. However, it is difficult to distinguish the two unless they co-occur. Further genetic study is required to clarify the relationship between *P. woodjonesi* and *P. eydouxi*.



A stout colony of *Pocillopora eydouxi*.



A close view showing the verrucae and polyps.



A large colony of *Pocillopora eydouxi* with spread branches.

Pocillopora woodjonesi Vaughan, 1918

Chinese Name	伍氏鹿角珊瑚
Family	Pocilloporidae
Publication	<i>Pocillopora woodjonesi</i> Vaughan, 1918
Synonymy	<i>Pocillopora woodjonesi</i> Veron and Pichon (1976); Dai (1989); Veron (1986); Nishihira & Veron (1995); Veron (2000)
Specimen	TUIO-C-510, 525, 526 (Nanwan Bay); ASIZ-5518 (Wanlitung); NMNS-000048-3229-3232 (Oluanpi and Lanyu)

Taxonomic description and diagnosis

Colonies are ramose and composed short branches that tend to become fan-shaped or contorted plates; may reach over a meter in diameter. Calices near the top of branches are cellular, with a diameter of approximately 0.7 mm, and without any internal structure; but those located on sides of branches is deep and may be slightly larger. Septa are arranged in two equal or sub-equal orders deep down the calice and extend half way to the center. One or a pair of directive septa is conspicuously dominant. Fine denticles may cover the irregularly toothed septal margins. Columella is pinnacle-like. The coenosteum is finely granulated, often forming costal striations around the edges of calices.

Living colonies are usually pink or brown.

Ecology

Usually found in reef areas exposed to strong to moderate wave action or currents. Rarely found on turbid water and protected reefs.

Occurrence

Southern Taiwan, Ludao, Lanyu, and Dongsha Atoll.

Distribution

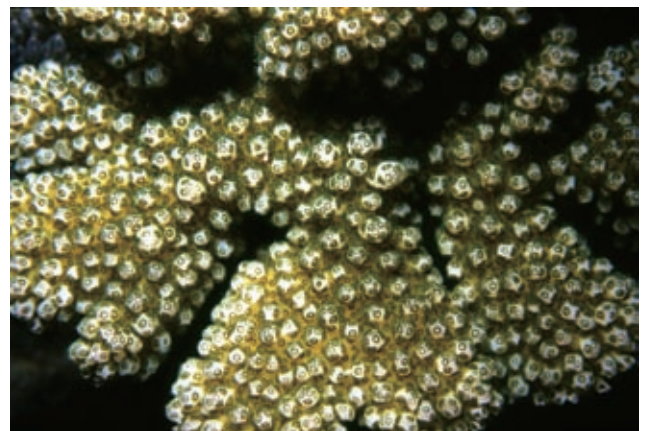
Widely distributed throughout the Indo-Pacific, from Bay of Bengal to French Polynesia.

Remarks

This species is similar to *Pocillopora eydouxi*, but the latter usually has more elongated and spread branches. However, it is difficult to distinguish the two unless they co-occur. Further genetic study is required to clarify the relationship between *P. woodjonesi* and *P. eydouxi*.



A large colony of *Pocillopora woodjonesi*.



A close view of fan-shaped branches with verrucae.

Seriatopora hystrix Dana, 1846

Chinese Name	尖枝列孔珊瑚
Family	Pocilloporidae
Publication	<i>Seriatopora hystrix</i> Dana (1846)
Synonymy	<i>Seriatopora hystrix</i> Vaughan (1918); Yabe et al. (1936); Crossland (1952); Wells (1954); Nemenzo (1964); Scheer & Pillai (1974); Veron & Pichon (1976); Dai (1989); Veron (1986); Nishihira & Veron (1995); Veron (2000) <i>Seriatopora angulata</i> Vaughan (1918); Yabe et al. (1936); Wells (1954); Nemenzo (1964) <i>Seriatopora crassa</i> Yabe et al. (1936); Nemenzo (1964); Scheer & Pillai (1974) <i>Seriatopora straeleni</i> Yabe & Sugiyama (1941) <i>Seriatopora dentritica</i> Veron (2000)
Specimen	TUIO-C-005, 053, 132, 353, 510, 553 (Nanwan Bay) SYUMB: ND-39 (Nanwan Bay), W-54 (Wanlitung) NMNS-000048-3293-3294 (Oluanpi and Lanyu)

Taxonomic description and diagnosis

Colonies are highly ramose with branches of variable shapes and sizes. Branchlets slowly taper to form slender and very sharp tips. Branchlets are highly variable in size, 1.5-29.0 mm in length and 1.0-9.0 mm in diameter. Branches are thicker, 1.2-10.0 mm in diameter. Branching angles varies from acute to right angles. These variations may be a result of different stages of branch extension.

Calices are immersed, elliptic, and arranged in longitudinal series along branches. Calical diameters are 0.4-0.9 mm and 0.3-0.7 mm in long and short axes, respectively. Except for a well-developed ventral primary septum, septa are weakly developed as simple rudimentary spines. Calical bottom has a prominent-axial ridge; which is spindle shaped and 0.03-0.17 mm in the longest width. Columella is hard to define, which is shallow dome-shaped and weakly developed on the center of the axial ridge. Thecal wall supports a row of tall spinules, and sometimes as prominent as a hooked structure as those of *Stylophora*.

Living colonies are pink, green, blue, or cream.

Ecology

Found mostly in shallow reef environments.

Occurrence

All reef areas around Taiwan except northern coast of Taiwan and Penghu Islands.

Distribution

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

Remarks

Colony morphology of *Seriatoproa hystrix* is highly variable. Colonies on the reef front exposed to strong wave action are more compact with thicker and shorter branches than those in protected areas. However, the association between the colony morphology and environmental factors has yet to be verified.



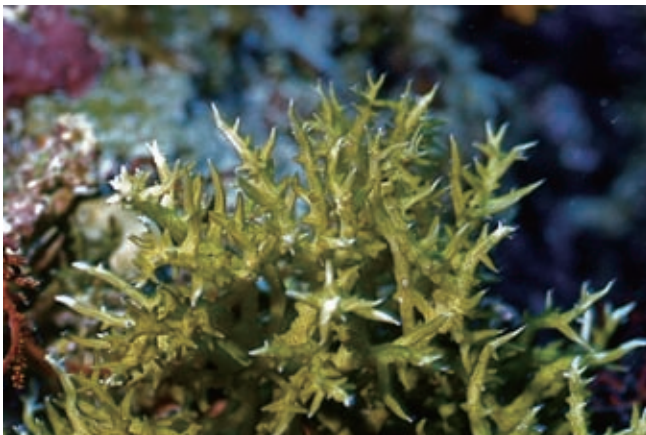
A slender colony of *Seriatopora hystrix*.



A close view of branches showing the polyps in longitudinal series.



Sympatric colonies of *Seriatopora hystrix* (left) and *Seriatopora caliendrum* (right).



A colony of *Seriatopora hystrix* (*dentritica* form)

Seriatopora caliendrum Ehrenberg, 1834

Chinese Name 鈍枝列孔珊瑚

Family Pocilloporidae

Publication *Seriatopora caliendrum* Ehrenberg (1834)

Synonymy *Seriatopora caliendrum* Yabe et al. (1936); Nemenzo (1964); Veron & Pichon (1976); Scheer & Pillai (1983); Dai (1989); Veron (1986), Nishihira & Veron (1995); Veron (2000)

Taxonomic description and diagnosis

Colonies are composed of masses of anastomosing branches of variable shapes and sizes. Branchlets are blunt ended. Colonies from reef front exposed to strong wave action are compact and with expanded branchlets. Colonies from protected areas have delicate and long branches and branchlets. Size ranges of the branchlet diameter, branchlet length and branch diameter are similar to those of *S. hystrix*.

Calices are immersed, circular and are arranged in longitudinal series along branches. Calical diameters are 0.5-0.9 and 0.5-0.8 mm in long and short axes, respectively. Septa are weakly developed as simple rudimentary spines, except for a well-developed ventral primary septum. Calical bottom has a prominent-axial ridge which is 0.02-0.1 mm in its longest width. Columella is hard to define, shallow, dome-shaped and weakly developed on the center of the axial ridge. Thecal wall supports a row of tall spinules, and sometimes as prominent as a hooked structure as those of *Stylophora*.

Living colonies are cream or brown.

Ecology

Found mostly on upper reef slopes.

Occurrence

All reef areas around Taiwan except northern and northeastern coasts.

Distribution

Widely distributed throughout the Indo-Pacific, from the east coast of Mozambique to Fiji.



A colony *Seriatopora caliendrum*.



A close view of branches.

Seriatopora stellata Quelch, 1886

Chinese Name	星枝列孔珊瑚
Family	Pocilloporidae
Publication	<i>Seriatopora stellata</i> Quelch (1886)
Synonymy	<i>Seriatopora stellata</i> Yabe et al. (1936); Scheer & Pillai (1974); Dai (1989); Veron (2000)
Specimen	TUIO-C-057, 512 (Nanwan Bay)



A compact colony of *Seriatopora stellata*.

Taxonomic description and diagnosis

Colonies are profusely branching. Branches are thick and strong, 5-9 mm in diameter, often coalescent. Branchlets are much smaller and shorter, 1-3 mm in diameter, 3-10 mm in length, and subacute at the distal ends. Calices are small, 0.5-0.7 mm in diameter. They are crowded and irregularly distributed at the thicker part of the branches, but often distinctly serrate near the apical parts. The margin of the calices is elevated and rimmed, giving a rounded appearance to most of the corallites. The six primary septa are well developed and usually exert. A styliform or a little elongated columella is detectable. The coenenchyme is covered with uniformly distributed spines.

Living colonies pink or cream.

Ecology

Occurs in shallow reef environments.

Occurrence

Southern and eastern coasts of Taiwan.

Distribution

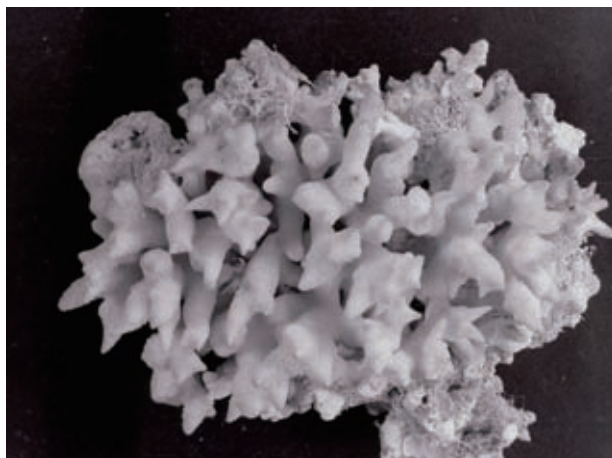
Widely distributed throughout the Indo-Pacific, from the Maldives to Fiji.

Remarks

The results of phylogenetic studies suggest that *S. stellata* may be a deformation of *S. caliendrum*. Colony morphology is often modified by symbiotic sponges or algae which reside inside the colony.



A close view of branch tips.



Skeleton of *Seriatopora stellata*.

Stylophora pistillata (Esper, 1797)

Chinese Name	萼形柱珊瑚
Family	Pocilloporidae
Publication	<i>Madrepora pistillaris</i> Esper (1797)
Synonymy	<i>Stylophora pistillata</i> Vaughan (1918); Yabe & Sugiyama (1932), (1935); Yabe et al. (1936); Crossland (1952); Wells (1954); Nemenzo (1964); Veron & Pichon (1976); Veron (1986); Dai (1989); Nishihira & Veron (1995); Veron (2000) <i>Stylophora mordax</i> Vaughan (1918); Yabe & Sugiyama (1935); Yabe et al. (1936); Vaughan & Wells (1943); Wells (1954); Scheer & Pillai (1974) <i>Stylophora dendritica</i> Nemenzo (1964) <i>Stylophora expanda</i> Nemenzo (1964) <i>Stylophora nana</i> Nemenzo (1964)
Specimen	TUIO-C-003, 189, 255 (Nanwan Bay), 056, 509, 511, 656 (Xiaoliuchiu) ASIZ-5519, 5520 (Nanwan Bay) NMNS-000048-3232-3292 (Oluanpi and Lanyu)

Taxonomic description and diagnosis

Colonies are ramose with slender, digitiform or palmate branches. The sizes of branches are 5-25 mm in diameter. Calices are circular, 0.6-1.2 mm in diameter, being smaller near the branch base and larger towards the branch tips. Corallites are thin-walled. Calices are inclined and form a hooked structure for most of calices. Septa are unequal and arranged in two cycles. The primary septa, 0.1-0.3 mm in length, extend toward a pinnacle-like columella. Septa of the second cycle are weakly developed or incomplete. Calices are increasingly shallow with increasingly thickened internal structures than those near the distal ends of branches, but sizes of calices and septa are not different. Calices are surrounded by coenenchyme ornamented with numerous fine spinules.

Living colonies are pink, blue, green, and pale to greenish brown, with pale branch ends.

Ecology

This species is a brooder with extended breeding season and has been regarded as an *r*-strategist.

Occurrence

All reef areas around Taiwan and offshore islets, but rare in Ludao, Lanyu and Dongsha Atoll.

Distribution

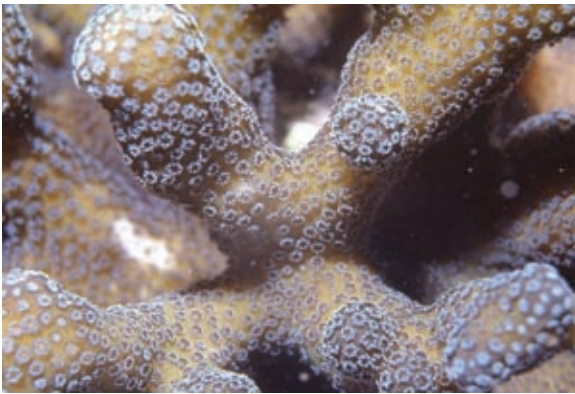
Widely distributed throughout the Indo-Pacific, from the Red Sea, and east Africa, to French Polynesia.

Remarks

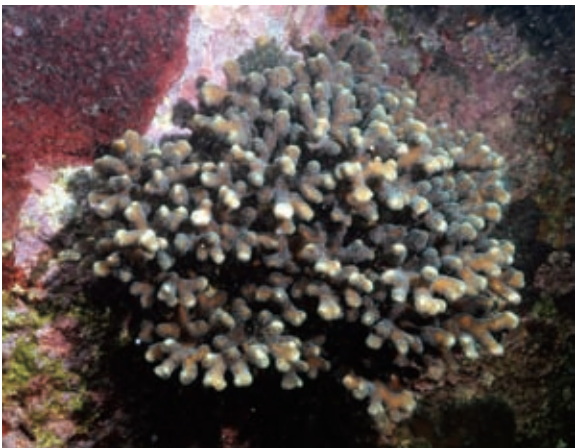
Colony morphology varies in different environments. Those from exposed reefs are often more massive and less ramose (ecomorph *mordax*), and those exposed to strong currents tend to have flattened prostrate branches.



A ramosely colony of *Stylophora pistillata*.



A close view of branches showing polyps.



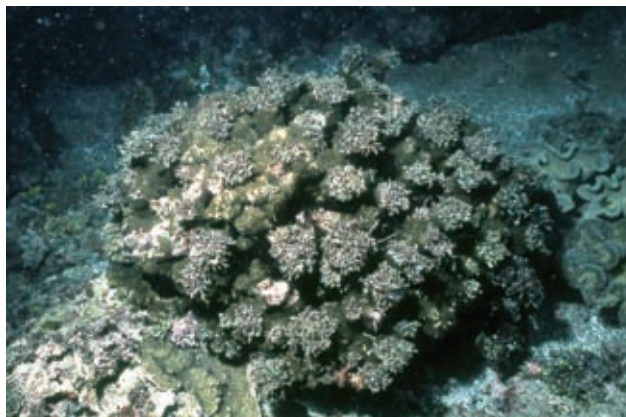
Stylophora pistillata (regular form).



Stylophora pistillata (mordax form).

Stylocoeniella armata (Ehrenberg, 1834)

Chinese Name 柱形合星珊瑚
Family Pocilloporidae
Publication *Porites armata* Ehrenberg (1834)
Synonymy *Stylocoenia hanzawai* Yabe & Sugiyama (1933)
Astrocoenia hanzawai Yabe & Sugiyama (1933); Wells (1935)
Stylocoeniella hanzawai Yabe & Sugiyama (1935); Yabe et al. (1936); Nemenzo (1964)
Stylocoeniella armata Wells (1954); Veron & Pichon (1976); Veron (1986); Nishihira & Veron (1995); Veron (2000)



A submassive colony of *Stylocoeniella armata*.

Taxonomic description and diagnosis

Colonies are encrusting or submassive. Calices are 1.0-1.3 mm in diameter and form excavations in the coenosteum. Corallites are cerioid or subcerioid, and may be square in outline. Septa in two cycles, subequal or equal in size. Paliform lobes are present and sometimes slightly marked. Styliform columella is distinct. Coenosteum style is prominent, one per corallite, and calices may be separated by a narrow strip of spinous coenenchyme.

Living colonies are brown, green, and dark to bright red.

Ecology

Occurs in shallow reef environments.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

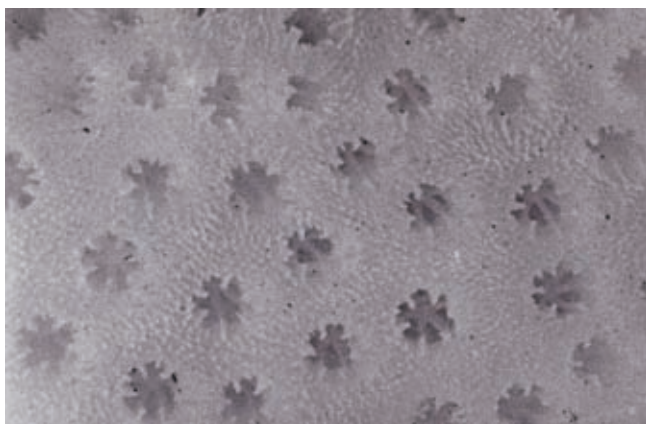
Widely distributed throughout the Indo-Pacific, from east Africa to French Polynesia.

Remarks

Stylocoeniella armata resembles *S. guentheri*, but the later has two cycles of septa which are unequal in size.



A close view showing polyps of *Stylocoeniella armata*.



Corallites and coenosteum of *Stylocoeniella armata*.

Stylocoeniella guentheri (Bassett-Smith, 1890)

Chinese Name 變形合星珊瑚

Family Pocilloporidae

Publication *Stylophora guentheri* Bassett-Smith (1890)

Synonymy *Stylocoeniella guentheri* Wells (1966); Veron & Pichon (1976); Scheer & Pillai (1983); Veron (1986); Dai (1989); Nishihira & Veron (1995); Veron (2000)

Specimen TUIO-C-147 (xiaoliuchiu), 235 (Nanwan Bay)

Taxonomic description and diagnosis

Colonies are encrusting, or massive with knob-like or columnar vertical expansions. Calices are 0.6-1.2 mm in diameter and widely spaced, flush with the coenosteum in between. Septa in 2 cycles, with the first cycle reaching the columella and the second cycle weakly developed. Styloform columella is distinct but small in size. Coenosteum styles are small but distinctive.

Living colonies are dark to greenish-brown in color.

Ecology

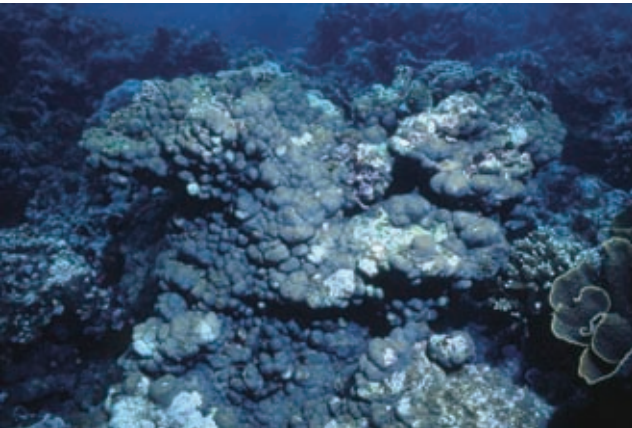
Found on protected reef biotopes, also in high latitude environments. Colonies are often deformed by infestations of serpulid worms and/or barnacles.

Distribution

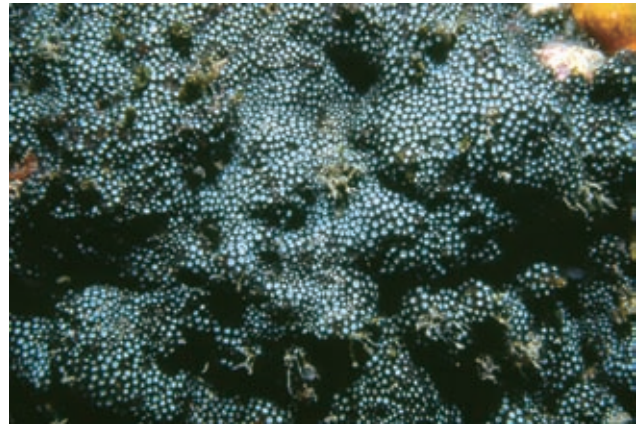
Widely distributed throughout the Indo-Pacific, from east Africa to French Polynesia.

Remarks

This species may be confused with *S. armata*, but the later has two cycles of well-developed septa.



An encrusting colony of *Stylocoeniella guentheri*.



A close view of polyps.

The Fungiidae is comprised of species with large polyps, the coralla of some solitary species may be larger than 50 cm in diameter. They are either solitary or colonial, free-living or sessile. Young corolla are usually attached to hard substrate, but the adult corolla of some species are detached and become free-living. These include all solitary species and some colonial genera (*Herpolitha*, *Polyphyllia*, *Ctenactis*, *Sandalolitha*). Other colonial genera, *Lithophyllon* and *Podabacia*, are permanently attached to the substrate.

Traditionally, the Fungiidae can be distinguished from other scleractinian corals by the presence of compound synapticalae between the septo-costal units (Hoeksema, 1989). The family contains 11 genera: *Fungia*, *Heliofungia*, *Ctenactis*, *Herpolitha*, *Polyphyllia*, *Sandalolitha*, *Zoopilus*, *Halomitra*, *Cantharellus*, *Lithophyllon* and *Podabacia*. All genera except *Zoopilus*, *Halomitra* and *Cantharellus* are represented in Taiwan. Recently, molecular phylogenetic studies revealed that (1) *Psammocora* and *Coscinaraea* from the family Siderastreidae, and (2) *Leptastrea* and *Oulastrea* from the family Faviidae, are more closely related to fungiid corals and should be included in Fungiidae (Fukami et al. 2008). However, more comprehensive morphological analyses of this new Fungiidae are needed.

The Fungiidae have long and rich fossil records. The earliest form was solitary and occurred in the middle Cretaceous, with great expansion and diversification during the late Tertiary and Recent (Wells, 1956). The fungiids with large polyps are often tolerant to sedimentation. Most free-living fungiids dwell on sandy substrate, they may puff-up their tissue and move over the substrate. Hence, these corals are sometimes regarded as “mobile corals”.

Simplified key to genera of Fungiidae

Colonies attached, foliaceous

- Colonies undersurface perforate.....*Podabacia*
- Colonies undersurface solid.....*Lithophyllon*

Coralla free-living

Coralla solitary

- Coralla with long, thick, extending tentacles.....*Heliofungia*
- Coralla without long, extending tentacles.....*Fungia*

Coralla colonial

Colonies elongated

- Septa covered with large, angular dentations.....*Ctenactis*
- Septa covered with fine, minute dentations.....*Herpolitha*
- Septa short and packed, may be petaloid.....*Polyphyllia*

- Colonies irregular in outline, dome-shaped, without axial furrow.....*Sandalolitha*

Colonies encrusting.....*Oulastrea*

Colonies massive

- Corallites cerioid, with extratentacular budding.....*Leptastrea*
- Corallites petaloid.....*Psammocora/Coscinaraea*

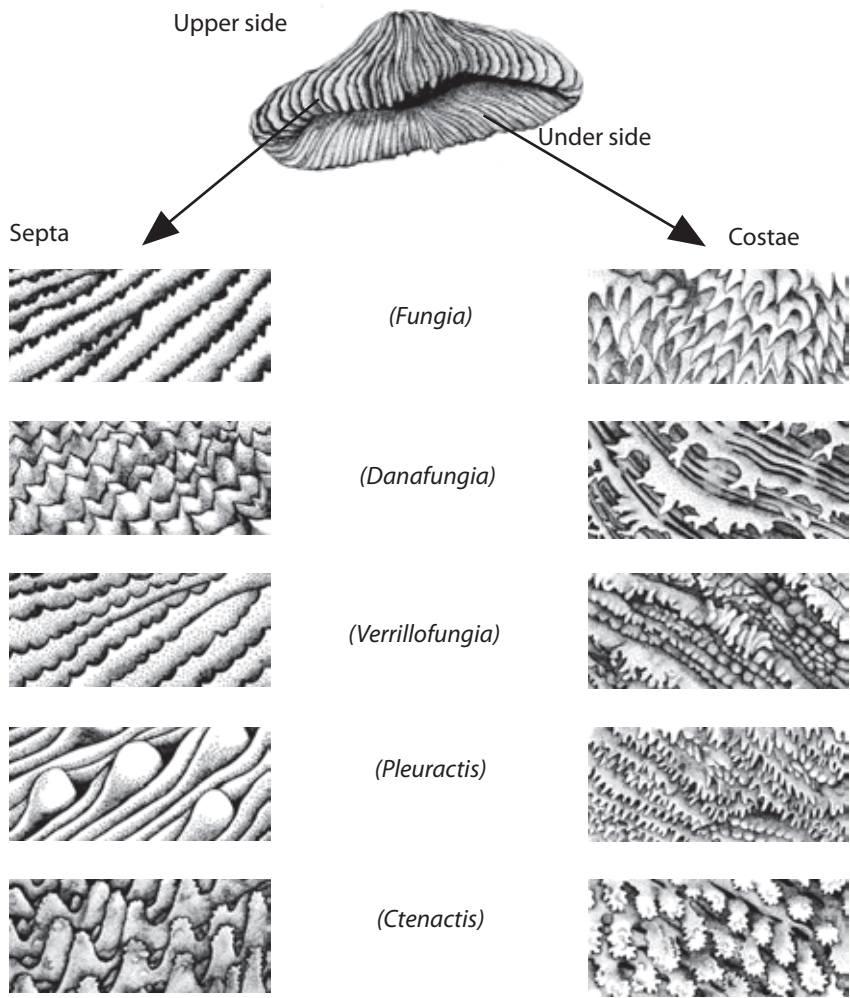
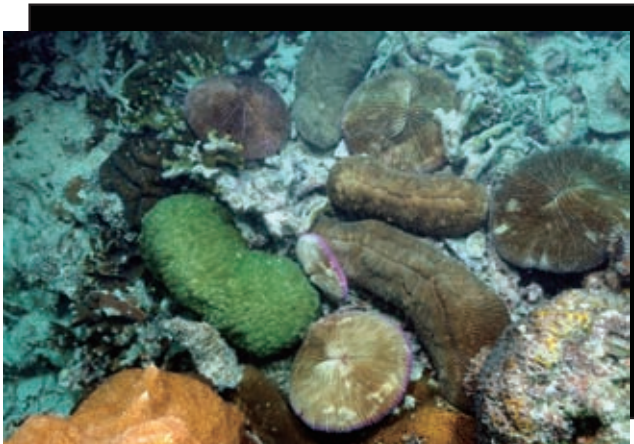
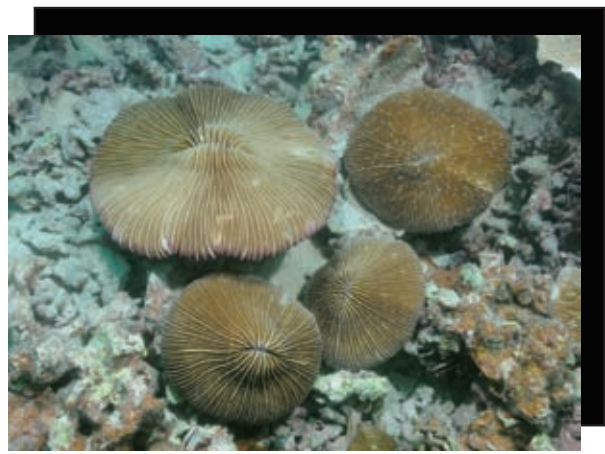


Fig. 1. The different subgenera of *Fungia* are distinguished by the shapes and arrangement of dentations on their septa (lef column) and costae (right column). (Redrawn after Veron, 1986)



An assemblage of solitary and colonial free-living fungiid corals.



Free-living coralla of *Fungia* spp.

Fungia (Cycloseris) costulata Ortmann, 1889

Chinese Name	直肋蕈珊瑚
Family	Fungiidae
Publication	<i>Fungia costulata</i> Ortmann (1889)
Synonymy	<i>Fungia doderleini</i> Yabe & Sugiyama (1941) <i>Fungia costulata</i> Ortmann (1889); Hoeksema & Dai (1991)
Specimen	NMNS 000017-F000480 -F000482/483, -F000489, -F000489/502, -F000505, 000196- F001461 (12) (Pleistocene at Panpingshan) RMNH 18112 (9) (Xiaoliuchiu) RMNH 18111 (2) (W Hengchun Peninsula) RMNH 18109,18110 (2), TUIO-C-603 (3) Nanwan Bay.



A corallum of *Fungia (Cycloseris) costulata*.

Taxonomic Description & Diagnosis

Coralla are thick, round, and up to 7.6 cm in diameter. The oral surface is convex and arched around the central fossa in the center of coralla; the undersurface is only slightly concave. Septa are unequal; the first two or three orders being conspicuously exsert towards the central part of the corallum, and slightly so towards the periphery. Thickness of lower order septa also increases towards the fossa. Small, sub-triangular, and irregular dentations cover the margins of septa. Well defined, laminar costae, covered by dense, short, irregular spines or granules on their upper margins, radiate from the corallum center on the underface.

Living coralla are cream or pale brown in color, sometimes with purple margins.

Ecology

Corals are free-living in adult stage. Usually found on lower reef slopes less exposed to wave action and on the soft substrata, but it is uncommon.

Occurrence

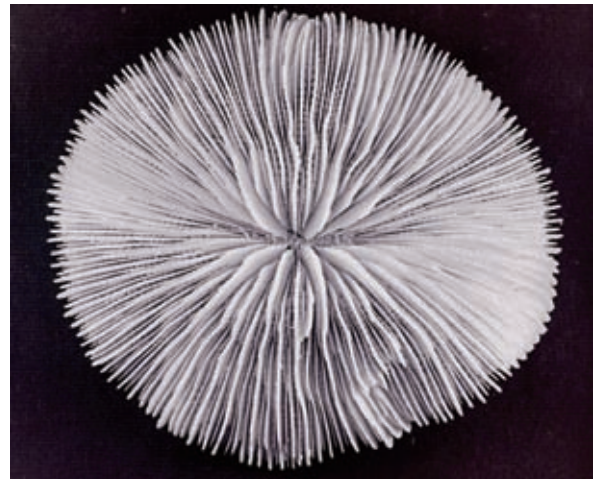
Xiaoliuchiu, Hengchun Peninsula, Dongsha Atoll

Distribution

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



A living corallum *Fungia (Cycloseris) costulata*.



A corallum skeleton of *Fungia (Cycloseris) costulata*.

Fungia (Cycloseris) cyclolites Lamarck, 1801

Chinese Name 環形葦珊瑚

Family Fungiidae

Publication *Fungia cyclolites* Lamarck (1801)

Synonymy *Fungia cyclolites* Yabe & Sugiyama (1932, 1935, 1941); Hoeksema & Dai (1991)

Cycloseris cyclolites Crossland (1952); Nemenzo (1955); Wells (1955); Eguchi (1968); Scheer & Pillai (1974); Veron & Pichon (1980); Nishihira & Veron (1995); Veron (2000)

Specimen RMNH 18105 (2) (Yenliao Bay)

NMNS 000017-F000494, -F000504, 000196-F001462 (2) (Pleistocene at Panpingshan)

RNMH 18106 (30) (Hsiao-Liuchiu)

SYUMB-S-0010 (W Hengchun Peninsula)

RMNH 18069, 18102 (3), 18103 (3), 18104 (3), TUIO-C-601 (23) (Nanwan Bay).

Taxonomic Description & Diagnosis

Coralla usually thick and varying from flat to arched. The shapes of complete individuals are slightly oval, with a maximum diameter of up to 41 mm, and 18 mm in height. Central fossa is relatively long. First and second order septa have vertical inner margins, and are conspicuously higher near the center of the corallum, while becoming equal towards the periphery. All septa bear minute triangular dentations of 0.4 mm. Higher order septa have small, pointed granules on the sides. Costae vary from thin and equal to regularly alternating, with small blunt spines or rounded granules. Columella is weakly developed.

Living coralla are pale cream or greenish, sometimes brightly colored in shallow waters. Major septal margins are often white.

Ecology

Corals are free-living in adult stage. Found on soft inter-reef and reef slopes with predominantly fine sediment, sometimes occur on reef substrate.

Occurrence

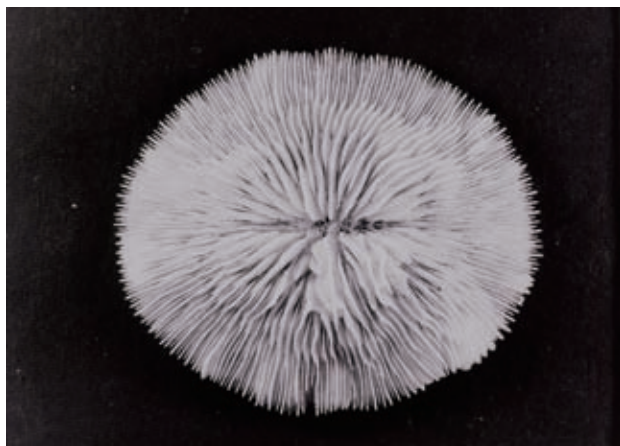
All reef areas from southern to northern Taiwan.

Distribution

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



A living corallum of *Fungia (Cycloseris) cyclolites*.



Corallum skeleton of *Fungia (Cycloseris) cyclolites*.

Fungia (Cycloseris) fragilis (Alcock, 1893)

Chinese Name	脆弱蕈珊瑚
Family	Fungiidae
Publication	<i>Diaseris fragilis</i> Alcock (1891)
Synonymy	<i>Fungia fragilis</i> Vaughan (1907); Hoeksema & Dai (1991) <i>Cycloseris fragilis</i> Wells (1954); Nishihira & Veron (1995); Veron (2000)
Specimen	NMNS 000017-F000503 (Pleistocene at Panpingshan) SYUMB-S-0012 (W Hengchun Peninsula) RMNH 18107 (4), 18108 (2), TUIO-C-602 (3) (Nanwan Bay).



A living corallum of *Fungia (Cycloseris) fragilis*.

Taxonomic Description & Diagnosis

Coralla thin and flat, with the oral surface slightly elevated towards the short central fossa. The shapes of unbroken coralla are irregularly circular, and up to 7 cm in diameter. Septa are thick, densely compact, and slightly alternating in size and thickness. Small, triangular dentations or thick granules either rounded or irregular are distributed along septal margins. Septal sides are strongly granulated, and the upper part is perforated. Costae are numerous and compacted, bearing regular minute conical spines. They become lower and disappear towards the center of the coralla.

Living coralla are grayish yellow to beige, often with a pale green margin.

Ecology

Corals are free-living in adult stage. Usually occurs on lower reef slopes and on soft substrata. The coralla are generally composed of several wedge-shaped sectors which break apart as a means of reproduction, with each sector being able to regenerate an entire corallum when becoming isolated.

Occurrence

Hengchun Peninsula, Dongsha Atoll

Distribution

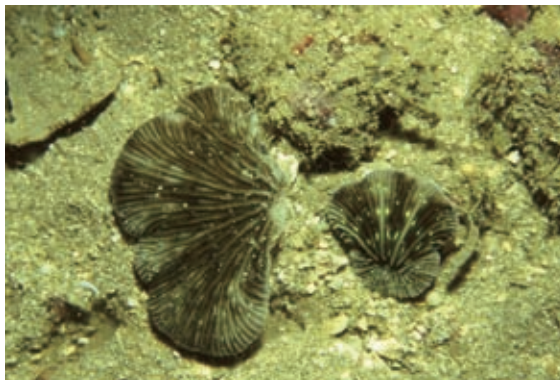
Widely distributed throughout the Indo-Pacific, from Red Sea and east Africa, to Okinawa, Marshal Islands and Samoa.



Corallum skeleton of *Fungia (Cycloseris) fragilis*.

Fungia (Cycloseris) sinensis (Milne Edwards & Haime, 1851)

Chinese Name	中國蕈珊瑚
Family	Fungiidae
Publication	<i>Cycloseris sinensis</i> Milne Edwards & Haime (1851)
Synonymy	<i>Cycloseris sinensis</i> Nemenzo (1971); Veron & Pichon (1979); Nishihira & Veron (1995) <i>Fungia (Cycloseris) sinensis</i> Hoeksema & Dai (1991)
Specimen	NMNS 000017-F000481, -F000484, -F0000488 (2), 000196-F001461 (several fragments from Pleistocene at Panpingshan) TUIO-C-600 (2), RMNH 18101 (9 fragments) (Nanwan Bay)



Coralla of *Fungia (Cycloseris) sinensis*.

Taxonomic Description & Diagnosis

Coralla usually thin, varying from flat to slightly arched, with circular to irregularly oval shapes. Corallum wall is solid. Central fossa is short and deep, not conspicuously arched, rarely there may be more than one central fossa. Septa are thick, with long and short ones alternately distributed. They are densely packed and almost equal in height, thus the central part of the corallum appears smooth. Granulations on septal sides are arranged in rows perpendicular to septal edge. Costae are fine and more or less of equal size.

Living coralla are usually pale brown, sometimes with purple margins.

Ecology

Corals are free-living in adult stage. Usually found on soft substrata, especially where current is relatively strong. Fragmentation of coralla is often observed though the species is rare.

Occurrence

Nanwan Bay in southern Taiwan

Distribution

Widely distributed throughout the Indo-Pacific, from Sumatra to French Polynesia and Hawaii.



A close view showing the alternating septa.



Skeleton of *Fungia (Cycloseris) sinensis*.

Fungia (Cycloseris) tenuis Dana, 1846

Chinese Name	細繖蕈珊瑚
Family	Fungiidae
Publication	<i>Fungia tenuis</i> Dana (1846)
Synonymy	<i>Fungia (Cycloseris) tenuis</i> Hoeksema (1989); Hoeksema & Dai (1991)
Specimen	RMNH 18113 (2) (Yenlian Bay) RMNH 18114 (15) (Xiaoliuchiu) RMNH 18115 (7), 18116 (19), TUIO-C-604 (38) (Nanwan Bay).



A living corallum of *Fungia (Cycloseris) tenuis*.

Taxonomic Description & Diagnosis

Coralla are thick and varies from flat to slightly concave. Outline varying from round to slightly oval, with a diameter of less than 15 cm. Corallum wall is solid, with only one central fossa. Density of septal dentations are more than 10/cm, granulations on septal fringe predominantly arranged in rows perpendicular to septal margin. Costae distinctly unequal in size, with lower order costae distinctly larger and thicker than other ones; the largest ones not regularly distributed. Costal spines unequal in size and directing in various direction.

Living coralla are pale brown or yellow.

Ecology

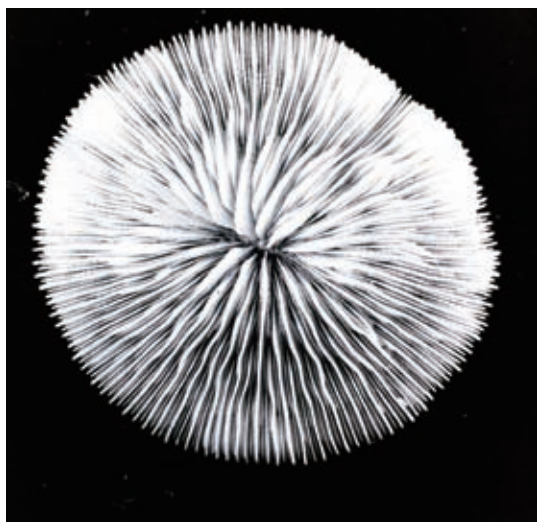
Coralla are free-living in adult stage. Mostly found on soft inter-reef substrate.

Occurrence

All reef habitats around Taiwan

Distribution

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



Skeleton of *Fungia (Cycloseris) tenuis*.

Fungia (Cycloseris) vaughani Boschma, 1923

Chinese Name	佛氏葶珊瑚
Family	Fungiidae
Publication	<i>Fungia vaughani</i> Boschma, 1923
Synonymy	<i>Cycloseris vaughani</i> (Boschma); Wells (1954); Veron & Pichon (1980); Nishihira & Veron (1995) <i>Fungia vaughani</i> Hoeksema & Dai (1991)
Specimen	RMNH 18117 (W Hengchun Peninsula) RMNH 18960, 18118 (4), TUIO-C-605 (Nanwan Bay).



A living corallum of *Fungia (Cycloseris) vaughani*.

Taxonomic Description & Diagnosis

Coralla are usually round, with flat undersurface, while the oral surface gradually rises in height toward the central fossa. Septa are numerous, with minute, triangular to lacerate dentations on the margins and small granules on the sides. First and second order septa are conspicuously thickened and arched towards the central fossa. Costae are distinctly unequal, with their thickness increasing towards the periphery of the undersurface. Costal spines are fine and direct downward. Usually distinct rows of granulations occur on costal sides, resembling those on the septa.

Living coralla are pale mottled brown, usually with the mouth pale colored.

Ecology

Corals are free-living in adult stage. Usually found on the lower part of reef slopes and on inter-reef soft substrata.

Occurrence

Hengchun Peninsula and Dongsha Atoll

Distribution

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



Skeleton of *Fungia (Cycloseris) vaughani*.



The undersurface of *Fungia (Cycloseris) vaughani*.

Fungia (Verrillofungia) concinna Verrill, 1864

Chinese Name 和諧蕈珊瑚
Family Fungiidae
Publication *Fungia concinna* Verrill (1864)
Synonymy *Fungia concinna* Vaughan (1918);
Yabe & Sugiyama (1941); Wells (1954);
Scheer & Pillai (1974); Veron & Pichon
(1980); Hoeksema & Dai (1991); Nishihira
& Veron (1995)
Fungia plana Yabe & Sugiyama (1935)
Specimen NMNS 000196-F001455, -F001465
(Pleistocene at Panpingshan)
RMNH 18119, TUIO-C-606 (3) (Nanwan
Bay).



A corallum of *Fungia (Verrillofungia) concinna*.

Taxonomic Description & Diagnosis

Coralla display very variable thickness, in some coralla, the margins are higher than the central part. Coralla are more or less circular, with a diameter of up to 16 cm. Lower order septa are more exsert than those of higher orders near the central fossa, their margins bearing angular dentations with a density from 3/cm to 24/cm. Higher order septal margins bear irregular spines or lobes. Septal sides are all covered with small, conical spines. Granulations on sides of dentations are arranged in rows parallel to septal edge. Costae are numerous, thin, cyclically unequal, and bear short, granular spines, being blunt or hirsute and branching at the top.

Living coralla are usually brown, sometimes with margins of contrasting colors.

Ecology

Corals are free-living in adult stage. Mostly found on reef slopes, lagoons or on patch reefs on soft substrata.

Occurrence

Nanwan Bay in southern Taiwan, Dongsha Atoll.

Distribution

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



A close view of septa and mouth.



Corallum skeleton of *Fungia (Verrillofungia) concinna*.

Fungia (Verrillofungia) repanda Dana, 1846

Chinese Name	盤形蕈珊瑚
Family	Fungiidae
Publication	<i>Fungia repanda</i> Dana (1846)
Synonymy	<i>Fungia repanda</i> Yabe & Sugiyama (1935, 1941); Eguchi (1938); Ma (1959); Veron & Pichon (1980); Hoeksema & Dai (1991); Nishihira & Veron (1995)
Specimen	NMNS 18120, 18121 (2), SYUMB-S-0005/0009 (W Hengchun Peninsula) TUIO-C-607 (13) (Nanway Bay).



A corallum of *Fungia (Verrillofungia) repanda*.

Taxonomic Description & Diagnosis

Coralla are usually thick, more or less circular, with a diameter of up to 30 cm. The oral surface is flat to strongly arched, with a height of up to 6 cm, while the undersurface is either flat or concave. Central fossa is elongate, narrow and deep. Lower order septa have more exsert septal margins near the central fossa, which bear triangular dentations, 1-3mm in height. Two or three ridges composed of series of granules run roughly parallel to septal margins, while the lower parts of septal sides are granulated or covered with small spines. Costae are cyclically unequal, the larger and smaller one corresponding to the lower and higher septal orders, respectively. Costae usually bear short, blunt spines.

Living coralla are usually yellowish-brown, with paler tentacles, and sometimes the margins may be red.

Ecology

Corals are free-living in adult stage. Usually occur in reef biotopes with heavy sedimentation.

Occurrence

Hengchun Peninsula, Dongsha Atoll

Distribution

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



A close view of oral surface and septa.



The undersurface of *Fungia (Verrillofungia) repanda*.

Fungia (Danafungia) horrida Dana, 1846

Chinese Name 刺蝟蕈珊瑚

Family Fungiidae

Publication *Fungia horrida* Dana (1846)

Synonymy *Fungia horrida* Nemenzo (1955); Stephenson & Wells (1955); Veron & Pichon (1980); Hoeksema & Dai (1991); Nishihira & Veron (1995); Veron (2000)

Specimen NMNS 000017-F000506, 000196-F001461 (Pleistocene at Panpingshan) RMNH 18122 (W Hengchun Peninsula)

RMNH 18123 (3), TUIO-C-608 (2) (Nanwan Bay)



An arched corallum of *Fungia (Danafungia) horrida*.

Taxonomic Description & Diagnosis

Coralla are thick and varies from flat to arched, reaching 20 cm in diameter. There may be a depression between the central furrow and the margin of the coralla. Corallum wall are usually solid, though a few perforations may occur near the periphery of the coralla. Principal septa are more exsert than those of the higher orders, particularly in the central part. Septal margins are irregularly dentate, with the dentations being triangular, lobate, or narrow and pointed. Lower order septa bear larger dentations. Costae are unequal, tall, cylindrical or conical costal spines only occur on principal costae. Higher order costae are devoid of spines.

Living coralla are usually brown or mottled, often with radiating stripes.

Ecology

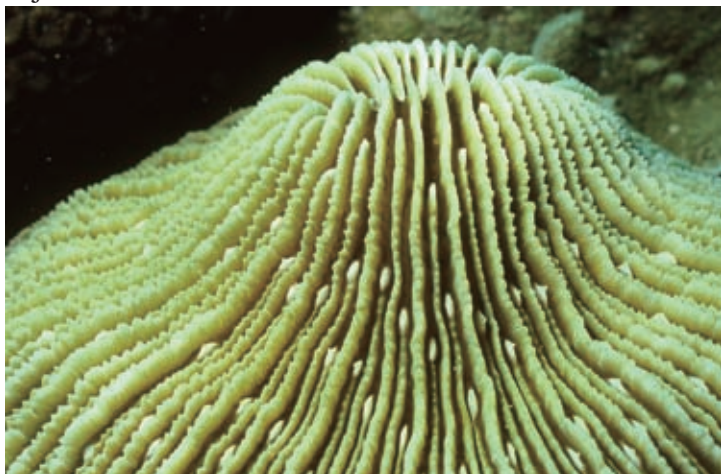
Corals are free-living in adult stage. Usually found in lower reef slopes and lagoons.

Occurrence

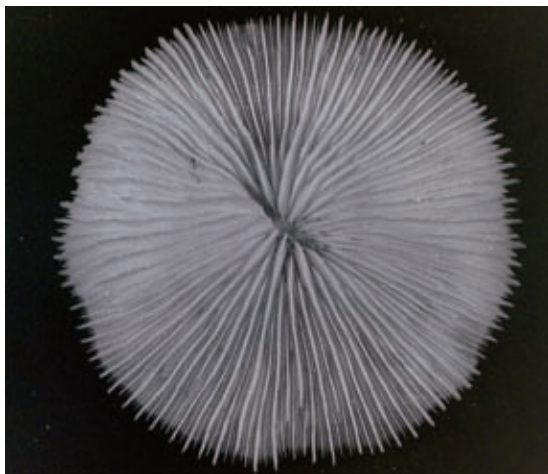
Hengchun Peninsula, Dongsha Atoll

Distribution

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



A close view of septa.



Corallum skeleton of *Fungia (Danafungia) horrida*.

Fungia (Danafungia) scruposa Klunzinger, 1879

Chinese Name	碓形蕈珊瑚
Family	Fungiidae
Publication	<i>Fungia scruposa</i> Klunzinger (1879)
Synonymy	<i>Fungia scruposa</i> Yabe & Sugiyama (1935, 1941); Nemenzo (1981) <i>Fungia (Danafungia) scruposa</i> Veron & Pichon (1980); Hoeksema & Dai (1991)
Specimen	NMNS 000017-F000492 (Pleistocene at Panpingshan) RMNH 18128 (2) (Xiaoliuchiu) RMNH 18071, 18127, TUIO-C-609 (2) (Nanwan Bay).



A corallum of *Fungia (Danafungia) scruposa*.

Taxonomic Description & Diagnosis

Coralla varies from flat to irregularly arched, circular to oval, may reach 24 cm in diameter. They are relatively thick and heavily calcified, with perforated walls. Central fossa is elongate. Septa are numerous, conspicuously unequal and arched around the central fossa. Lower order septa are thicker than higher order ones. Septal margins are covered by irregularly sized and shaped dentations, mostly are irregularly triangular, but may be thickened, vertical rod-like or straight to curved styloid type. Costae are numerous, the principal ones bearing tall costal spines with spinulose tips. Secondary costae are without spines, thus visible only near the periphery.

Living coralla are usually brown or mottled, often with radiating stripes.

Ecology

Corals are free-living in adult stage. Usually found in shallow reef slopes and lagoons.

Occurrence

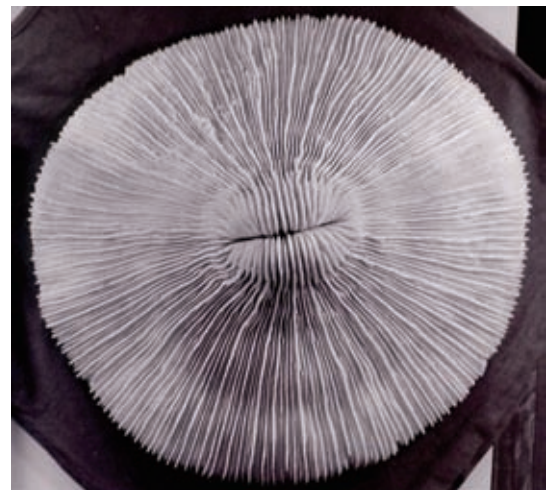
Xiaoliuchiu, Hengchun Peninsula, Dongsha Atoll

Distribution

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



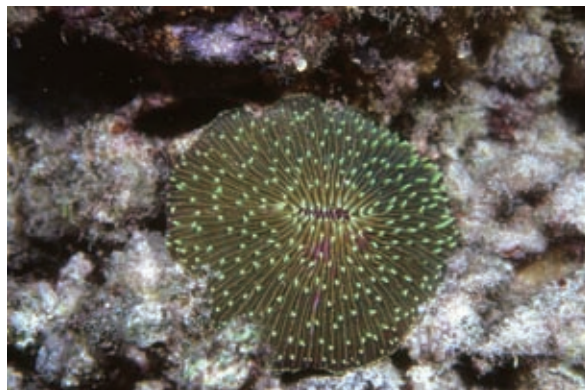
A close view of oral surface and septa.



Skeleton of *Fungia (Danafungia) scruposa*.

Fungia (Fungia) fungites (Linnaeus, 1758)

Chinese Name	真蕈珊瑚
Family	Fungiidae
Publication	<i>Madrepora fungites</i> Linnaeus (1758)
Synonymy	<i>Fungia dentata</i> Gardiner (1898) <i>Fungia fungites</i> (Linnaeus); Vaughan (1918); Hoffmeister (1925); Eguchi (1938); Yabe & Sugiyama (1935, 1941); Crossland (1952); Wells (1954); Ma (1959); Scheer & Pillai (1974); Zou (1975); Veron & Pichon (1979); Hoeksema & Dai (1991); Nishihira & Veron (1995)
Specimen	TUIO-C-610 (Hongchai, W. Hengchun Peninsula).



A circular corallum of *Fungia (Fungia) fungites*.

Taxonomic Description & Diagnosis

Coralla varying from flat to slightly arched, with uniform thickness. They are circular to slightly oval, occasionally with irregular outline, reaching up to 28 cm in diameter. Corallum wall may be perforated or solid. Central fossa is elongated and narrow. Septa are numerous, thin, densely packed, sometimes being slightly wavy. Dentations vary greatly in shape and type, from obtuse to acute. Dentations are usually triangular and slightly thickened, may also be tall, narrow lobes or curving styloid tips. Septal margins may also be smooth, devoid of any ornamentation. Costae are numerous, with conical spines, spinulose tips, and smooth, even sides.

Living coralla are usually brown, often mottled.

Ecology

Corals are free-living in adult stage. Mostly found on lower reef slopes and lagoons.

Occurrence

Hengchun Peninsula, Dongsha Atoll

Distribution

Widely distributed throughout the Indo-Pacific, from Mozambique and Red Sea to French Polynesia and Tuamotu Archipelago.



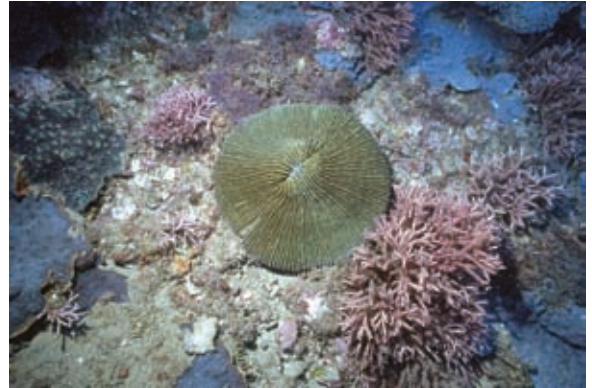
Note the triangular dentations on septal margins.



Corallum skeleton of *Fungia (Fungia) fungites*.

Fungia (Wellsofungia) granulosa Klunzinger, 1879

Chinese Name	顆粒葶珊瑚
Family	Fungiidae
Publication	<i>Fungia granulosa</i> Klunzinger (1879)
Synonymy	<i>Fungia granulosa</i> Nemenzo (1955); Veron & Pichon (1980); Hoesema & Dai (1991)
Specimen	NMNS 000017-F000496, 000162-F001265, 000196-F001460 (Pleistocene at Panpingshan) RMNH 18074 (3), 18124 (2), 18125, TUIO-C-611 (23) (Nanwan Bay)



A corallum of *Fungia (Wellsofungia) granulosa*.

Taxonomic Description & Diagnosis

Coralla varies from flat to slightly convex, usually the oral surface is arched around the narrow and elongate central fossa. Coralla are generally circular, with a maximum diameter of 13.5 cm. Walls of coralla are perforated, the perforations are small, narrow and elongate. Septa are numerous, with wavy lower order septa that are only slightly more exsert than higher order ones. Septal margins are all thick and bear numerous fine, angular dentations or irregular blunt granules. Costae are indistinct, only lower order costae are slightly prominent. Instead, the under surface is densely covered with small papillae or spines which are arranged in rows corresponding to the costae.

Living coralla are usually brown in color.

Ecology

Corals are free-living in adult stage. Mostly found on the lower parts of reef slopes and lagoons.

Occurrence

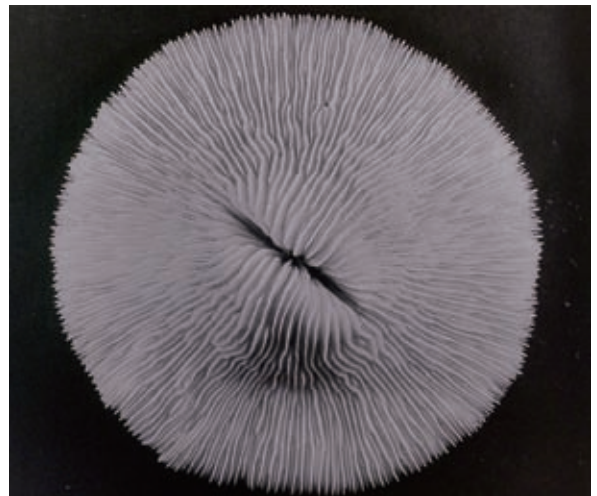
Nanwan Bay in southern Taiwan, Dongsha Atoll

Distribution

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



A close view of the arched oral surface.



A corallum skeleton with wavy septa.

Fungia (Lobactis) scutaria Lamarck, 1801

Chinese Name 元寶葦珊瑚

Family Fungiidae

Publication *Fungia scutaria* Lamarck (1801)

Synonymy *Fungia scutaria* Vaughan (1918); Yabe & Sugiyama (1941); Crossland (1952); Wells (1955); Scheer & Pillai (1974); Veron & Pichon (1980)
Fungia (Lobasctis) scutaria Hoeksema & Dai (1991)

Specimen *Fungia gravis* Nemenzo (1955)
NMNS 000196-F001454, F-001457 (Pleistocene at Panpingshan); RMNH 18131, SYUMB-S-0018/0019 (W Hengchun Peninsula); RMNH 18073, 18129 (2), 18130 (4), TUIO-C-612 (77) (Nanwan Bay)



A living corallum of *Fungia (Lobactis) scutaria*.

Taxonomic Description & Diagnosis

Coralla are thick and heavy, with an oval outline which may be elongated, with roughly straight and parallel sides that are up to 17 cm in length and 11cm in width. Septa are numerous, arranged in approximately five orders, only first order septa reach the central fossa. The higher the order of septa, the further away from central fossa do they rise. Septal margins beyond their tentacular lobes are finely and angularly serrated. Tentacular lobes are triangular, round, or square, up to 1 mm thick which are much thicker than the septa, thus septa appear wavy. Costae are numerous and distinct, bearing spines of variable shapes.

Living coralla are usually brown or green, often with some red or yellow tissue, thus a corallum may display a mixture of colors.

Ecology

Corals are free-living in adult stage. Mostly found on lower reef slopes or the soft substrata nearby.

Occurrence

All reef areas in Taiwan

Distribution

Widely distributed throughout the tropical Indo-Pacific.



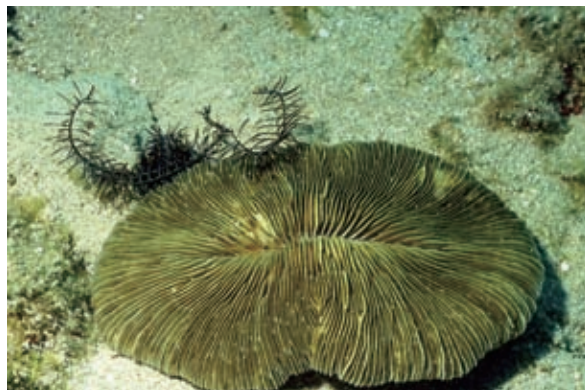
A close view showing the septa and tentacular lobes.



Skeleton of *Fungia (Lobactis) scutaria*.

Fungia (Pleuractis) gravis Nemenzo, 1955

Chinese Name 沉重蕈珊瑚
Family Fungiidae
Publication *Fungia gravis* Nemenzo (1955)
Synonymy *Fungia gravis* Hoeksema & Dai (1991)
Specimen NMNS 000017-F000485, 000162-F001267,
000196-F001454/F001455, -F001457
(Pleistocene at Panpingshan)
RMNH 18134 (2), TUIO-C-615 (5)
(Xiaoliuchiu)
SYUMB-S-0011 (W Hengchun Peninsula).



An elongate corallum of *Fungia (Pleuractis) gravis*.

Taxonomic Description & Diagnosis

Coralla outline vary from oval to slightly elongated, with a maximum diameter of 25 cm. Coralla are thick and usually with a slightly humped oral surface. Under surface varies from flat to slightly concave. Detachment scar usually not visible. Corallum wall perforated. Septa densely packed, those of lower orders being solid. Tentacular lobes occasionally present. Septal dentations fine, blunt and irregularly granular or slightly angular and sharp. Septal sides are densely granulated in an irregular pattern. Costae equal and regularly shaped, with a density of < 40/cm. Costal spines blunt and laterally compressed.

Ecology

Corals are free-living in adult stage. Mostly found on reef slopes, common in Taiwan.

Occurrence

Xiaoliuchiu, Hengchun Peninsula, Dongsha Atoll

Distribution

Widely distributed in the west pacific from the Great Barrier Reef to Okinawa.



A juvenile corallum of *Fungia (Pleuractis) gravis*.



Corallum skeleton of *Fungia (Pleuractis) gravis*.

Fungia (Pleuractis) moluccensis van der Horst, 1919

Chinese Name 摩鹿加蕈珊瑚
Family Fungiidae
Publication *Fungia moluccensis* van der Horst (1919)
Synonymy *Fungia moluccensis* Veron & Pichon (1980); Hoeksema & Dai (1991)
Fungia somervillei Gardiner; Scheer & Pillai (1974)
Specimen NMNS 000058-001010, 001011 (Pleistocene near Kaohsiung); RMNH 18132, SYUMB-S-0001/0004 (W Hengchun Peninsula); RMNH 18133, TUIO-C-613 (6) (Nanwan Bay)



A corallum with three centers.

Taxonomic Description & Diagnosis

Coralla outline are irregular, usually irregularly elongate or oval. Coralla are usually strongly humped around the fossa but comparatively thin at the periphery. Lower side flat or concave. Corallum wall perforated. Septa are unequal and sometimes sinuous. First order septa more exert than second order ones around the fossa, but both orders thickened and spongiöse at the center of the corallum. Septal dentations may be small, angular and sharp, or are rough, ragged granules. Costae unequal and irregularly shaped. Costal spines blunt and granular. Up to 12 supernumerary centers may be present.

Living coralla cream, brown or mottled.

Ecology

Mostly found on the lower parts of reef slopes, on the soft bottom nearby and turbid environments.

Occurrence

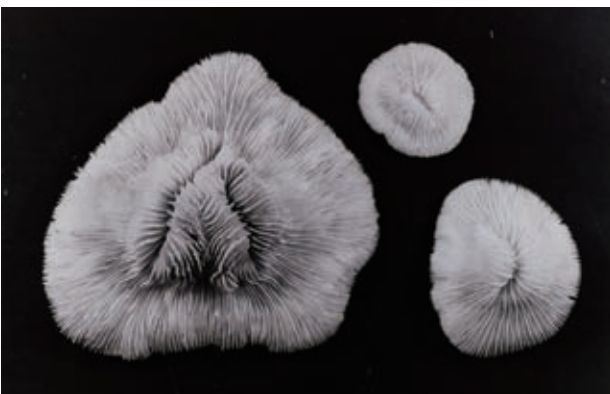
Coastal areas of Hengchun Peninsula.

Distribution

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

Remarks

Coralla may remain adherent even in their adult stage. When the attachment is only at the center of the coralla, with most of the undersurface free, coralla are generally flattened and thin, with large attachment scar. Those that are adherent to the substrate along most of the undersurface are usually very contorted, with indistinct or no costal structures except near the margins.



Skeletal structures of *Fungia (Pleuractis) moluccensis*, upper surface (left) and under surface (right).

Fungia (Pleuractis) paumotensis Stutchbury, 1833

Chinese Name	笏形蕈珊瑚
Family	Fungiidae
Publication	<i>Fungia paumotensis</i> Stutchbury (1833)
Synonymy	<i>Fungia paumotensis</i> Vaughan (1907); Eguchi (1938); Yabe & Sugiyama (1941); Crossland (1952); Ma (1959); Scheer & Pillai (1974); Veron & Pichon (1980); Hoeksema & Dai (1991); Nishihira & Veron (1995); Veron (2000)
Specimen	NMNS 000017-F000487, -F000490, 000196-F001461 (Pleistocene at Panpingshan); RMNH 18135, TUIO-C-616 (9) (Xiaoliuchiu); SYUMB-S-0013 (W Hengchun Peninsula)



A living corallum of *Fungia (Pleuractis) paumotensis*.

Taxonomic Description & Diagnosis

Coralla outline are usually elongated, with roughly straight, parallel sides, occasionally are they oval. Coralla are thick and heavy, vary from flat to strongly convex; sometimes with humped oral surface. Largest coralla may reach 25 cm in length, 13.5 cm in width, and 8 cm in height. Corallum wall perforated. Detachment scar is usually not visible. Septa are straight or slightly wavy, extending from the fossa to the corallum margin. Septal dentations varying from fine to moderately coarse; they are angular and blunt. Granulations on septal sides arranged in ridges parallel to septal edge. Costae equal and regularly shaped. Costal spines blunt and laterally compressed. Tentacular lobes absent.

Living coralla are usually brown.

Ecology

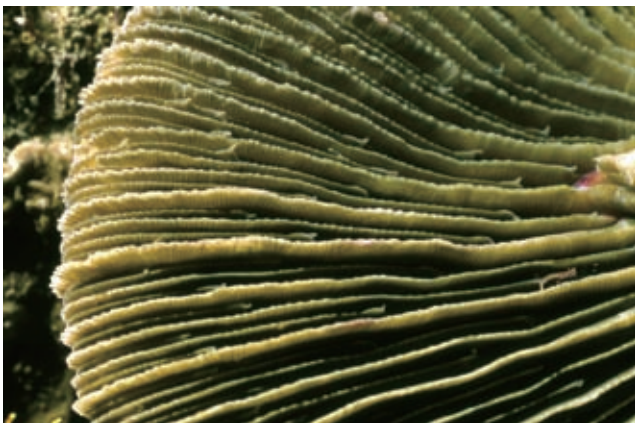
Corals are free-living in adult stage. Mostly found on reef slopes and lagoons.

Occurrence

Xiaoliuchiu, Hengchun Peninsula, Dongsha Atoll

Distribution

Widely distributed throughout the Indo-Pacific, from Red Sea and Madagascar, to Tuamotu Archipelago and Hawaii.



A close view showing the septa.



Corallum skeleton of *Fungia (Pleuractis) paumotensis*.

Fungia (Pleuractis) taiwanensis

Hoeksema & Dai, 1991

Chinese Name 台灣蕈珊瑚
Family Fungiidae
Publication *Fungia taiwanensis* Hoeksema & Dai (1991)

Specimen RMNH 18152 (holotype) and RMNH 18153(3), 18154 (5), TUIO-C-614-1 (6), USNM 87618 (paratypes) (typelocality Hsiao-Liu-Chiu, ca. 10 dm off SW Taiwan).
RMNH 18155 (4) (W Hengchun Peninsula)



RMNH 18156, 18157 (4), 18158 (17), A living corallum of *Fungia (Pleuractis) taiwanensis*.
TUIO-C-614-7 (10) (Nanwan Bay)

Taxonomic Description & Diagnosis

Coralla are irregularly oval and elongated, with rounded or tapering ends, with length of the specimens varying from 3.5 to 28.0 cm. Coralla vary in thickness, slightly to strongly curved, with perforated walls. The oral surface is convex; the area around the fossa is usually slightly humped. In addition to a large central fossa, many smaller mouths are formed in an irregular pattern, by circumoral budding. The length of the central fossa, 1/8 to 1/3 of the corallum length. Detachment scar is visible.

Septa are densely packed, usually straight at the corallum periphery, but may be slightly curved in between or near the stomata. Lower order septa are thick, more exsert and either perforated or solid, while those of higher orders are thin and always perforated. Septal margins are finely ornamented with dentations which are fine and sharp, slightly elongated and lobated, or shaped like ravels. Septal sides are covered by dense, evenly distributed granulations. Costae are unequal and high, those of lower orders may be thickened. They are finely to coarsely ornamented with spines which are either blunt and granular, or laterally compressed and lobated, or slightly echinose (particularly in small corals).

Living coralla are brown, with small tentacles that are usually distinctly white, occasionally transparent.

Ecology

Adults are free-living, whereas juveniles live attached by means of a stalk. Most specimens occurred on the lowest parts of reef slopes and on the soft substrata of reef bases, where it may be deeper than 30 m.

Occurrence

Xiaoliuchiu and Hengshun Peninsula

Distribution

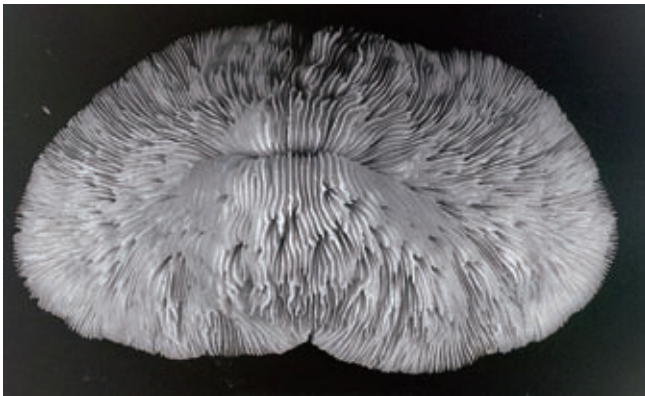
Distributed only in Taiwan, more common in Nanwan Bay, Kenting and Xiaoliuchiu.

Remarks

The species is relatively common in Taiwan. In the field, it can easily be distinguished from co-occurring specimens of *Fungia moluccensis* by the large number of mouths and the usually white tentacles. Due to the large number of mouths, this species resemble those of *Sandalolitha*. Nevertheless, adults in the latter genus do not show such a long central fossa.



A juvenile corallum of *Fungia (Pleuractis) taiwanensis*.



Skeleton of *Fungia (Pleuractis) taiwanensis*.



Two coralla of *Fungia (Pleuractis) taiwanensis*.



A close view of *Fungia (Pleuractis) taiwanensis*.

Heliofungia actiniformis (Quoy & Gaimard, 1833)

Chinese Name	輻形太陽蕈珊瑚
Family	Fungiidae
Publication	<i>Fungia actiniformis</i> Quoy & Gaimard (1833)
Synonymy	<i>Fungia actiniformis</i> Eguchi (1938); Yabe & Sugiyama (1941); Wells (1956) <i>Heliofungia actiniformis</i> Veron & Pichon (1980); Hoeksema & Dai (1991); Nishihira & Veron (1995); Veron (2000)
Specimen	NMNS 000017-F000491, -F000493, -F000497, -F000516, -F000520 (several casts), 000162-F001267, 000196-F001450/1452 (4), -F001455, -F001459, -F001463/1464 (3) (Pleistocene at Panpingshan, SW Taiwan)



A living corallum of *Heliofungia actiniformis*.

Taxonomic Description & Diagnosis

Coralla thick and heavy, with outline varying from slightly oval to circular, reaching 20 cm in diameter and 7 cm in height. Corallum wall solid, with a distinct detachment scar on the undersurface. The first three or four orders of septa are prominent, with dentations lobate or coarse and triangular. The dentations are larger, more conspicuous on lower order septa. All septa bear granules. Costae are numerous laminar ridges, irregular near the center of the corallum, but uniform towards the periphery.

Ecology

Corals are free-living in adult stage. Usually found on flat, soft or rubble substrate in turbid environments and lagoons. Polyps are almost always fully extended, with numerous thick tentacles up to 8 cm long, which terminates in a well defined knob.

Occurrence

Only found in Xiaoliuchiu.

Distribution

Widely distributed throughout the Indo-Pacific, from Bay of Bengal to Marshall Islands and Samoa.



A fossil corallum of *Heliofungia actiniformis*.



The undersurface of a fossil corallum.

Ctenactis crassa (Dana, 1846)

Chinese Name	厚實梳草珊瑚
Family	Fungiidae
Publication	<i>Fungia crassa</i> Dana (1846)
Synonymy	<i>Ctenactis crassa</i> Verrill (1864); Hoeksema & Dai (1991)
Specimen	RMNH 18136 (Xiaoliuchiu); TUIO-C-617 (2) (Nanwan Bay)



An elongate colony of *Ctenactis crassa*.

Taxonomic Description & Diagnosis

Coralla are elongated, the maximum corallum diameter may be over 50 cm. Adults with several mouths, with all mouths or only largest mouths arranged in distinct row along the central axis. Coralla are thick and vary from flat to arched. Corallum wall perforated. Septa are densely distributed. The density of septal dentations is $< 10/\text{cm}$. Septal dentations are coarse, elongated and angular, at least 1.5 mm apart. Granulations on septal sides evenly distributed. Costae are unequal, covered by large and echinose spines. Tentacles are short.

Living coralla are usually brown.

Ecology

Corals are free-living in adult stage. Usually found on lower reef slopes protected from strong wave action, or on the sandy bottom of lagoons.

Occurrence

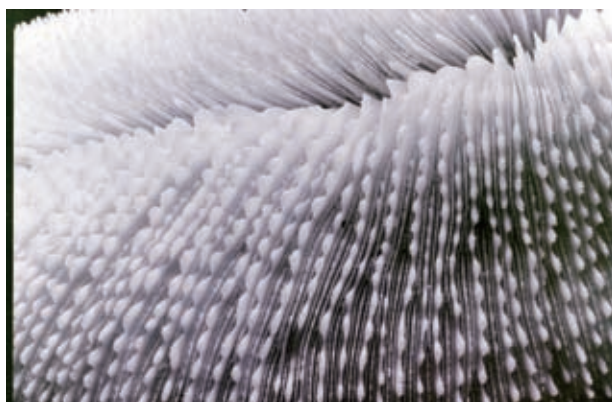
Xiaoliuchiu, Nanwan Bay in southern Taiwan, Dongsha Atoll.

Distribution

Widely distributed throughout the Indo-Pacific, from the Maldives to Marshall Islands and Samoa. Also recorded from the Red Sea.



Skeletal structure of *Ctenactis crassa*.



A close view showing septal dentations.

Ctenactis echinata (Pallas, 1766)

Chinese Name 棘狀梳蕈珊瑚
Family Fungiidae
Publication *Madrepora echinata* Pallas (1766)
Synonymy *Fungia echinata* Vaughan (1907);
Ma (1937); Yabe & Sugiyama (1941);
Crossland (1952); Wells (1954); Ma (1959);
Scheer & Pillai (1974); Veron & Pichon
(1980); Hoeksema & Dai (1991); Nishihira
& Veron (1995)
Specimen NMNS 000048-3357 (S Taiwan)



An elongate colony of *Ctenactis echinata*.

Taxonomic Description & Diagnosis

Coralla are elongated, with an average length/width ratio of 2-2.5, sometimes reaching 3. Adults usually with single mouth, occasionally with several mouths along central axis. Coralla are thick, varying from flat to arched. Corallum wall perforated. Septa are numerous, may be as many as 1000 in larger coralla. Primary septa are distinctly exsert and thicker than the others, in between are 1 to 5 smooth or inconspicuously dentate secondary septa. Dentations on primary septal margins are large, lobate or subtriangular, often with echinulate tops and granulated sides. The undersurface is covered with cylindrical or arborescent spines whose tops are spinulose or granulose, which are arranged in regular rows corresponding to costae.

Living coralla are usually brown.

Ecology

Corals are free-living in adult stage. Mostly found on reef slopes and lagoons.

Occurrence

Hengchun Peninsula, Dongsha Atoll.

Distribution

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



A close view of coralla showing large dentations on septa margins.



Skeletal structure of *Ctenactis echinata*.

Herpolitha limax (Houttuyn, 1772)

Chinese Name 蛞蝓石珊瑚

Family Fungiidae

Publication *Madrepora limax* Houttuyn (1772)

Synonymy *Herpolitha limax* (Houttuyn); Yabe & Sugiyama (1941); Crossland (1952); Wells (1954); Scheer & Pillai (1974); Veron & Pichon (1980)
Herpolitha stricta Hanzawa (1931); Nemenzo (1955)

Herpetolitha limax Vaughan (1918)

Specimen NMNS 000162-F001265, 000196-F001458, -F001468, -F001457 (Pleistocene at Panpingshan) RMNH 18137, SYUMB-S-0014/0017 (W Hengchun Peninsula); RMNH 18138 (2), TUIO-C-618 (7) (Nanwan Bay)



An elongate colony of *Herpolitha limax*.

Taxonomic Description & Diagnosis

Colonies are elongated oval or with pointed tips, may be very irregular for regenerated fragments, the length/width ratio usually ranges from 1.5-6. Colonies are mostly arched, but those with a small length/width ratio may be flat. A series of primary centers are linearly distributed along the central axes, with numerous secondary centers on either side. Septa form an irregular series running almost parallel in a transverse direction from one center to another, except towards the corallum ends. Septal margins bear regular, fine, angular dentations, with sides that are finely granulated. The undersurface is perforate on the periphery, and covered with fine, spinulose or tuberculate spines.

Living colonies are green or brown.

Ecology

Corals are free-living in adult stage. Found in most reef biotopes, most often occur on protected reef slopes of water depth more than 12 m.

Occurrence

Hengchun Peninsula, Xiaoliuchiu, Ludao, Dongsha Atoll

Distribution

Widely distributed throughout the Indo-Pacific, from the northern Red Sea and Mozambique Channel, to the Tuamotu Archipelagos.



A colony with extending tentacles.



Skeleton of *Herpolitha limax*.

Polyphyllia talpina (Lamarck, 1801)

Chinese Name	多葉珊瑚
Family	Fungiidae
Publication	<i>Fungia talpina</i> Lamarck (1801)
Synonymy	<i>Polyphyllia talpina</i> (Lamarck); Vaughan (1918); Eguchi (1938); Yabe & Sugiyama (1941); Crossland (1952); Scheer & Pillai (1974); Veron & Pichon (1979); Hoeksema & Dai (1991); Nishihira & Veron (1995)
Specimen	NMNS 000196-F001456 (Pleistocene at Panpingshan); RMNH 18139 (2), TUJO-C-619 (2) (Xiaoliuchiu)



A colony of *Polyphyllia talpina* with tentacles extending.

Taxonomic Description & Diagnosis

Colonies are usually thick, varying from flat to strongly arched. They are generally elongate, often irregular in shape, and are sometimes branched. Centers are numerous, usually arranged in the axial furrow. Principal septa are short, elliptical, thick lamellae, sometimes may be petaloid, and are densely packed. They radiate from the fossa, becoming parallel from each other in a direction perpendicular to the perimeter. Septal margins are rounded or lobate for short ones, flat for longer ones. Septal dentations are fine and angular, with round granulation or conical spinules distributed over their sides. The undersurface is covered with dense, minute spines from blunt and spinose to long with granulations.

Living colonies are grey, green, dark or pale brown. Tips of the tentacles are white.

Ecology

Corals are free-living in adult stage. Mostly found on protected reef slopes and lagoons, often occur on muddy substrates. Tentacles are numerous, usually extended during the day.

Occurrence

Xiaoliuchiu, Hengchun Peninsula, Dongsha Atoll

Distribution

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



A close view of the colony of *Polyphyllia talpina*.



Skeleton of *Polyphyllia talpina*.

Sandalolitha dentata Quelch, 1884

Chinese Name	鋸齒屨珊瑚
Family	Fungiidae
Publication	<i>Sandalolitha dentata</i> Quelch (1884)
Synonymy	<i>Sandalolitha dentata</i> Hoeksema & Moka (1989); Hoeksema & Dai (1991) <i>Sandalolitha robusta</i> Veron & Pichon (1979); Randall & Mayers (1981)
Specimen	RMNH 18145 (3) (Xiaoliuchiu) RMNH 18141 (W Hengchun Peninsula) RMNH 18072, 18142 (2), 18143, 18144 (5), TUIO-C-620 (6) (Nanwan Bay)



A large colony of *Sandalolitha dentata*.

Taxonomic Description & Diagnosis

Colonies are irregular in shape and flat. They are polycentric, with a larger, distinct central fossa. Secondary mouths are primarily clustered at both ends of the relatively large central one and mainly concentrated in the direction of the central axis. Septa of low orders are conspicuously higher than neighboring septa of higher orders. Septal dentations are irregularly shaped, long and sharp.

Living colonies are usually brown or mottled, sometimes with white corallite centers.

Ecology

Corals are free-living in adult stage. The species is relatively common in Taiwan, frequently encountered in broken and regenerated shape. They are usually found on reef slopes and on upper parts of reef bases, most often occur in calm, deeper waters.

Occurrence

Xiaoliuchiu, Hengchun Peninsula, Dongsha Atoll

Distribution

Widely distributed from east Indian Ocean to the Pacific, from Sumatra to French Polynesia.

Remarks

This species is similar to *Sandalolitha robusta*, but the former is distinguished by its flatter, more irregular shape.



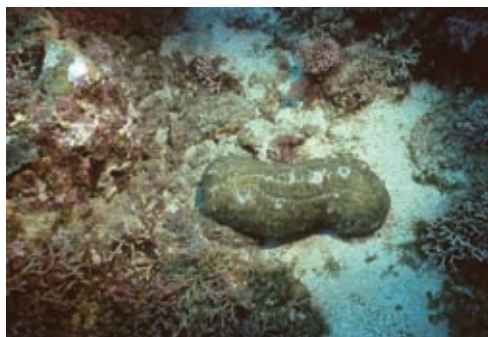
A juvenile colony of *Sandalolitha dentata*.



Skeleton of *Sandalolitha dentata*.

Sandalolitha robusta (Quelch, 1886)

Chinese Name	強壯屨珊瑚
Family	Fungiidae
Publication	<i>Podabacia robusta</i> Quelch (1886)
Synonymy	<i>Halomitra robusta</i> Yabe & Sugiyama (1941); Crossland (1952) <i>Parahalomitra robusta</i> (Quelch); Wells (1954); Nemenzo (1955) <i>Sandalolitha robusta</i> (Quelch); Veron & Pichon (1980); Hoeksema & Dai (1991); Nishihira & Veron (1995); Veron (2000)
Specimen	NMNS 000196-F001453 (Pleistocene at Panpingshan) RMNH 18140, TUIO-C-621 (2) (W Hengchun Peninsula)



A living colony of *Sandalolitha robusta*.

Taxonomic Description & Diagnosis

Colonies are usually round to oval, irregular in outline, polycentric without an axial furrow nor a distinct central corallite. They are flat to dome-shaped, up to 50 cm in length and 30 cm in thickness. Septa are of variable length, radiating from every center to next, running parallel to each other. Principal septa are thick, the margins bearing rounded or flat, granulated dentations up to 2 mm high. Secondary septa are thinner with finely dentate margins, and they alternate with the principal ones. The undersurface is densely covered with club-shaped or ramose spines that are irregularly granulated.

Living colonies are usually greenish-brown, yellow-brown, dark brown or mottled, sometimes with purple margins and white corallite centers.

Ecology

Corals are free-living in adult stage. Found in most reef habitats, mostly occur on reef slopes and lagoons.

Occurrence

Hengchun Peninsula, Ludao, Dongsha Atoll

Distribution

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

Remarks

This species is similar to *Sandalolitha dentata*, but the former is usually dome-shaped and roughly circular.



A close view of the corallites and septa.



Skeleton of *Sandalolitha robusta*.

Lithophyllon mokai Hoeksema, 1989

Chinese Name 摩卡氏靈芝珊瑚

Family Fungiidae

Publication *Lithophyllon mokai* Hoeksema (1989)

Synonymy *Lithophyllon mokai* Hoeksema (1989); Hoeksema & Dai (1991)

Specimen RMNH 18149, TUIO-C-623 (W Hengchun Peninsula)

Taxonomic Description & Diagnosis

Colonies are polycentric, and attached to the substratum on their sides. They are unifacial, encrusting, cupshaped or foliaceous, with a diameter of less than 15 cm. Corallites are relatively densely distributed. Septa are equal towards the periphery but those of the lower orders are conspicuously higher and thicker towards the central part of the colony. Septal dentations are very small and numerous. Costal spines small and granular, cylindrical-conical or arborescent. Tentacles are short.

Living colonies are usually brown.

Ecology

Usually occur in shallow reef environments.

Occurrence

Hengchun Peninsula, Dongsha Atoll

Distribution

Widely distributed throughout the Indo-Pacific, from Bay of Bengal to Marshall Islands and Samoa.

Remarks

This species is similar to *Lithophyllon undulatum*, but the former is mainly distinguished by its smaller colonies which does not exceed 15 cm in diameter.



A foliaceous colony of *Lithophyllon mokai*.



Skeleton of *Lithophyllon mokai*.

Lithophyllon undulatum Rehberg, 1892

Chinese Name 波形靈芝珊瑚
Family Fungiidae
Publication *Lithophyllon undulatum* Rehberg (1892)
Synonymy *Lithophyllon edwardsi* Veron & Pichon (1979)
Podabacia elegans Yabe, Sugiyama & Eguchi (1936)
Lithophyllon lobata Utinomi (1965); Nemenzo (1980)
Lithophyllon elegans Utinomi (1971)
Lithophyllon formosa Yabe & Sugiyama (1932); Yabe et al. (1936)
Lithophyllon undulatum Hoeksema & Dai (1991)



A large colony of *Lithophyllon undulatum*.

Specimen RMNH 18146 (5) (Yenliao Bay); RMNH 18147 (W Hengchun Peninsula; RMNH 18148; TUIO-C-622 (21); NMNS 000048-3295 through 3336 (Nanwan Bay)

Taxonomic Description & Diagnosis

Colonies are attached and foliaceous. Initially they are encrusting, after reaching 8cm in diameter, they become laminar or foliaceous, with entire and regular margins or lobate and folded margins. A larger, central corallites may be distinguished in most colonies, while secondary corallites decrease in size towards the periphery. Septa are arranged in an alternating pattern, radiating from the colony center, becoming parallel near the periphery. Septa are short in the central part of the colony, increasing in length and becoming thinner towards the colony margin. Principal septa are higher and thicker. Septal margins are densely covered with minute, irregular granules, or irregularly contorted spines. The undersurface is covered with inconspicuous costae.

Living colonies are greenish-brown, blue-grey or brown, sometimes the corallites have white centers.

Ecology

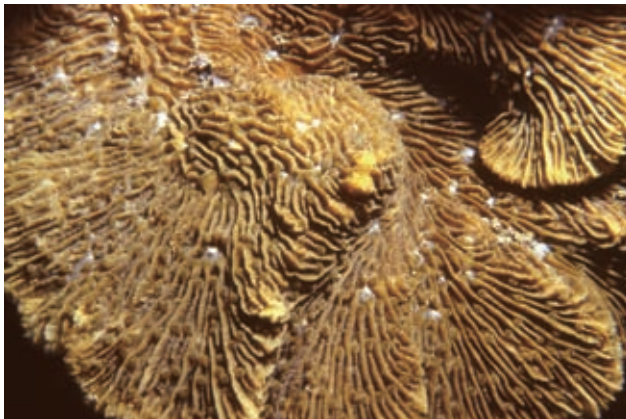
The species is one of the most common fungiids of Taiwan, usually occur on hard substrata or rocky walls from depth 10-25 m.

Occurrence

All reef areas in Taiwan

Distribution

Widely distributed from east Indian Ocean to the Pacific, from the Malay Peninsula to the Samoa.



A close view of the colony.



Skeleton of *Lithophyllon undulatum*.

Podabacia crustacea (Pallas, 1766)

Chinese Name	殼形足柄珊瑚
Family	Fungiidae
Publication	<i>Madrepora crustacea</i> Pallas (1766)
Synonymy	<i>Podabacia crustacea</i> Yabe & Sugiyama (1935); Yabe et al. (1936); Crossland (1952); Nemenzo (1955); Veron & Pichon (1979); Hoeksema & Dai (1991); Nishihira & Veron (1995); Veron (2000)
Specimen	RMNH 18150, 18151, TUIO-C-624 (4) (Nanwan Bay)



A colony of *Podabacia crustacea*.

Taxonomic Description & Diagnosis

Colonies are attached to the substrata in adult stage, however, fragments that break off may survive in free-living form. Colonies are unifacial, foliaceous or cup-shaped, with margins folded, lobate or curled, may reach over 1 m in diameter. Septa are short, and strongly alternate in height and thickness, running parallel from each other and perpendicular to the colony margin. Those close to secondary centers are often petaloid. Septal dentations are fine and lobate, becoming higher towards the end to the septa, corresponding to the increase in septa thickness towards the end. Those septa close to colony periphery are longer, with smaller, more numerous dentations.

Living colonies are usually brown, with pale margins.

Ecology

Often found on reef slopes where the current is weak and turbidity is slightly higher.

Occurrence

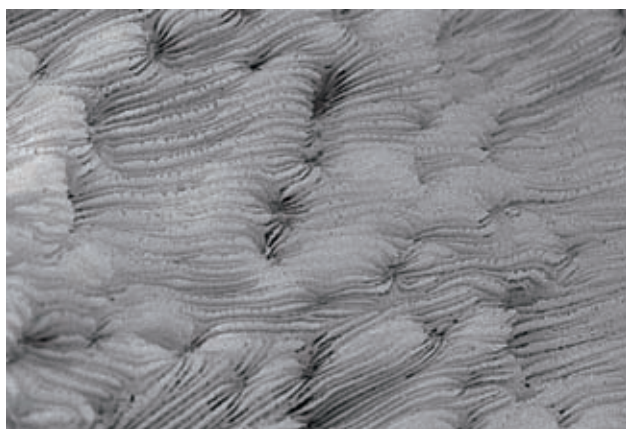
All reef areas in Taiwan

Distribution

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



A close view of *Podabacia crustacea*.



Skeleton structure of *Podabacia crustacea*.

Leptastrea pruinosa Crossland, 1952

Chinese Name 白斑柔星珊瑚

Family Fungiidae

Publication *Leptastrea pruinosa* Crossland, 1952

Synonymy *Leptastrea pruinosa* Veron et al. (1977); Nishihira & Veron (1995); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are usually flat and encrusting. Corallites are cerioid and polygonal. Septa are arranged in distinctive cycles, with sides and margins covered by granulations. Septal granules protrude to form pseudo-synapticulae.

Living colonies are usually dark chocolate brown, normally with a green oral disc; sometimes they may be pale green to almost white or very bright, occasionally the stomodaeum is different in color from the surrounding oral discs.

Ecology

Commonly found in most shallow reef environment.

Occurrence

All reef areas in Taiwan

Distribution

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

Remarks

This species is difficult to differentiate from *Leptastrea purpurea* from skeletal structures. However, it is readily recognised underwater by their polyps which are frequently expanded during the day, while the latter is usually nocturnal. Color differences are also striking, whereas the latter is usually creamy-yellow.



A colony of *Leptastrea pruinosa*.



A close view showing the polygonal corallites.

Leptastrea purpurea (Dana, 1846)

Chinese Name 紫柔星珊瑚

Family Fungiidae

Publication *Astraea purpurea* Dana (1846)

Synonymy *Leptastrea purpurea* (Dana); Yabe & Sugiyama (1935); Yabe et al. (1936); Eguchi (1938); Crossland (1952); Stephenson & Wells (1955); Chevalier (1968); Veron et al. (1977); Nishihira & Veron (1995); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are irregularly encrusting or massive, which may exceed 1 m in diameter. They may also occur as coralliths up to 15 cm across. Corallites are sub-ceroid, discrete and polygonal, ranging from 2-11 mm in diameter, the smaller calices usually clustered in concave parts. Septa are usually arranged in four incomplete cycles, the lower order ones being more exsert and usually dentate, with larger dentations toward the calice center which eventually form paliform lobes. Septal sides are conspicuously granulated. Columella are well developed, consisting of a few pinnacles intermixed with paliform lobes. Costae are usually poorly developed. The coenosteum is usually a narrow, smooth strip overshadowed by the exsert septa of adjacent corallites.

Living colonies are usually pale yellow or cream with dark calices on their upper surfaces, the sides are usually darker in color.

Ecology

Occurs in a wide range of habitats. All budding is extratentacular.

Occurrence

All reef areas in Taiwan

Distribution

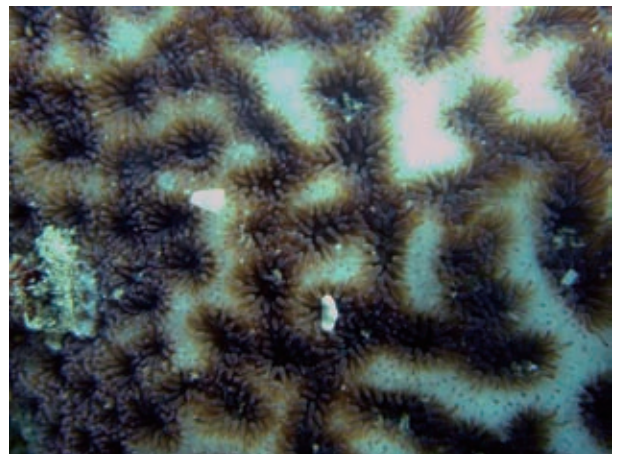
Widely distributed throughout the Indo-Pacific, from the Red Sea and east Africa to Hawaii.

Remarks

Colony growth forms are closely associated with the environment they occupy. Those from biotopes exposed to strong wave action or current are mostly massive. Colonies from protected or turbid waters are usually thin and encrusting, with well developed inter-calicular grooves.



A colony of *Leptastrea purpurea*.



A close view of corallites and coenosteum.

Leptastrea transversa Klunzinger, 1879

Chinese Name 橫柔星珊瑚

Family Fungiidae

Publication *Leptastrea transversa* Klunzinger (1879)

Synonymy *Leptastrea transversa* Vaughan (1918); Crossland (1952); Stephenson & Wells (1955); Chevalier (1968); Scheer & Pillai (1974); Veron et al. (1977); Nishihira & Veron (1995); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are flat and massive or encrusting, with polygonal, cerioid corallites of 2-9 mm in diameter. Septa may be in four to five orders, extending inward roughly 2/3 of the calice radius then descend vertically, where they become strongly dentate near the base of the calice. Septa of the first two orders are slightly exsert, sometimes thickened, and reach the spongy, trabecular columella. Paliform dentations are present, becoming vertical towards the calice center where they fuse together to form an elongated base, supporting a series of papillae that are aligned lengthwise along the columella. Intercalicular groove are usually present.

Living colonies are pale cream, green or yellow in color, sometimes with grey calices.

Ecology

Occurs in most reef environments. Budding is always extratentacular.

Occurrence

All reef areas in Taiwan

Distribution

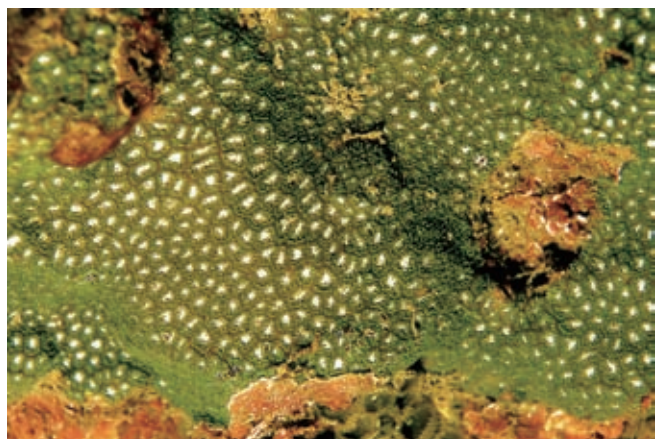
Widely distributed throughout the Indo-Pacific, from the Red Sea and east Africa to Tuamotu Archipelago.

Remarks

Colony growth forms are closely associated with the environment they occupy. Those from exposed biotopes are mostly massive, highly calcified, with small calices well separated by thickened walls. Colonies from protected or turbid waters are usually encrusting.



A massive colony of *Leptastrea transversa*.



A close view of corallites of *Leptastrea transversa*.

Psammocora contigua (Esper, 1797)

Chinese Name 連續沙珊瑚
Family Fungiidae
Publication *Madrepora contigua* Esper (1797)
Synonymy *Psammocora contigua* Eguchi (1935);
Yabe et al. (1936); Crossland (1952);
Nemenzo (1955); Stephenson & Wells
(1955); Veron & Pichon (1976); Veron (1986);
Nishihira & Veron (1995); Veron (2000)
Psammocora gonagra Vaughan (1918);
Stephenson & Wells (1955)
Psammocora vaughani Yabe et al. (1936)



A colony of *Psammocora contigua*.

Taxonomic Description & Diagnosis

Colonies are usually composed of bifacial, irregularly-shaped, rod-like branches of variable width. Colonies may be up to 50 cm in diameter and 10 cm in height, with plate-like branches twisted and anastomosed when growing in clear, protected waters; branches become very stunted and compact, or nodular in shape when growing in turbid waters or biotopes exposed to currents; branches become thicker, short and submassive in those exposed to strong currents. Corallites are shallow and the colony surface is smooth. Calices form slight fossae, spaced 1-2 mm apart, often forming rows in shallow valleys. Number of septa varies from 5-25. Masses of minutely branching granules uniformly cover interlocking septa and coenenchymal lobes. Columella may be peg-like and granulated or trabecular.

Living colonies are pale to dark gray-brown.

Ecology

Occurs in a wide range of environments, usually found on shallow reef habitats and soft substrate.

Occurrence

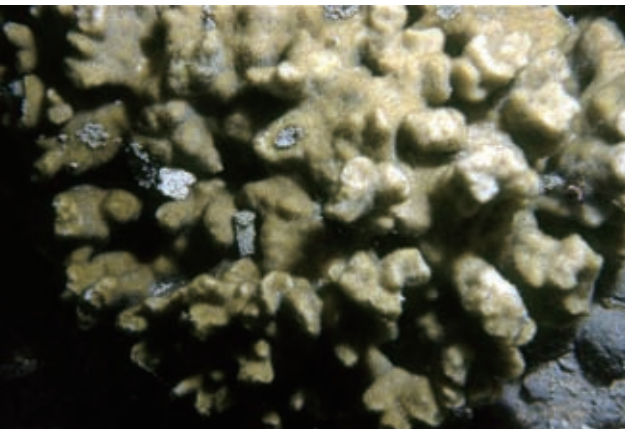
All reef areas around Taiwan and offshore islets.

Distribution

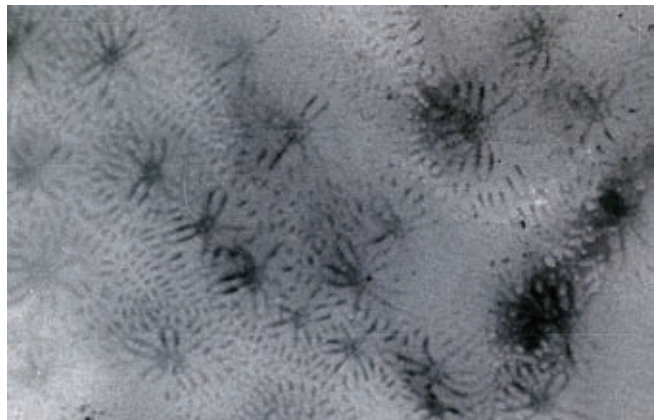
Widely distributed throughout the Indo-Pacific, from east Africa to French Polynesia.

Remarks

This species has fine, superficial corallites similar to those of *P. superficialis*, but the two are easily distinguished by their different growth forms.



A close view of the irregular-shaped branches.



Skeletal structure of *Psammocora contigua*.

(x10)

Psammocora digitata Edwards & Haime, 1851

- Chinese Name** 指形沙珊瑚
Family Fungiidae
Publication *Psammocora digitata* Edwards & Haime (1851)
Synonymy *Psammocora digitata* Veron & Pichon (1976); Veron (1986); Nishihira & Veron (1995); Veron (2000)
Psammocora exaesa Yabe & Sugiyama (1935); Eguchi (1935); Yabe, et al. (1936); Crossland (1952); Nemenzo (1955)
Psammocora togianensis Wells (1954)



A columnar colony of *Psammocora digitata*.

Taxonomic Description & Diagnosis

Colonies are encrusting when small; larger ones are usually columnar, with vertical columns approximately 1.5-6.5 cm in diameter, and circular or elliptical in cross section. In protected shallow waters, colonies may be dome-shaped and ramose, reaching 2.5 m across. Corallites are shallow, some with distinct fossae. Calices have a regular, flower-like appearance, average 2.0-3.3 mm in diameter, with 7-10 septa independently reaching the calice center. Septa may be single, bifurcated, trifurcated or petaloid, terminating in small, vertical, blunt monticules. Both inner and outer septal margins are united by inconspicuous synapticular rings located deeply. Columella is indistinct, trabecular or consists of a small pinnacle. The complex matrix of the coenenchyma is formed by the irregularly interlocking septo-costae. All skeletal structures, except the synapticular rings, are irregularly granulated, with the granules covered by fine denticles.

Living colonies are uniform pale purple, grey or brown.

Ecology

Occurs in most reef environments, but usually uncommon. Polyps are usually extended during the day.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

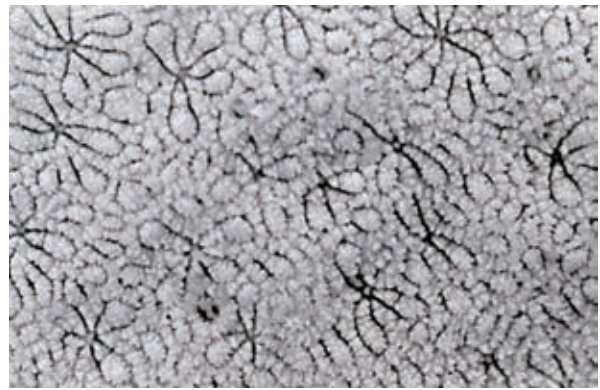
Widely distributed throughout the Indo-Pacific, from Mozambique Channel to French Polynesia.

Remarks

This species is similar to *Coscinaraea exesa* in growth-form, but the two are easily distinguished by their calicular structures.



A close view of the colony surface.



A close view of the flower-like calices.

(x8)

Psammocora haimeana Edwards & Haime, 1851

Chinese Name	海紋沙珊瑚
Family	Fungiidae
Publication	<i>Psammocora haimeana</i> Edwards & Haime (1851)
Synonymy	<i>Psammocora haimeana</i> Wells (1954); Veron & Pichon (1976); Veron (1986); Nishihira & Veron (1995); Veron (2000)



A colony of *Psammocora haimeana*.

Taxonomic Description & Diagnosis

Colonies are submassive. Corallites are irregularly polygonal, form distinct fossae, with a diameter of 2.5-4.0 mm, and situated at the bottom of depression or short valleys which has distinct to acute walls. Septa decrease in thickness towards calice centers. Approximately 12 septa reach the columella, with up to 6 of these bifurcating or trifurcating towards calicular margins, where up to 24 septa may be counted in full grown calices. Septa, columella, and reticular coenenchyme are all granulated. Small paliform lobes are present surrounding the columella.

Living colonies are uniform grey or brown, sometimes brightly colored.

Ecology

Occurs in shallow reef environments, but usually uncommon. .

Occurrence

Northern Taiwan

Distrtion

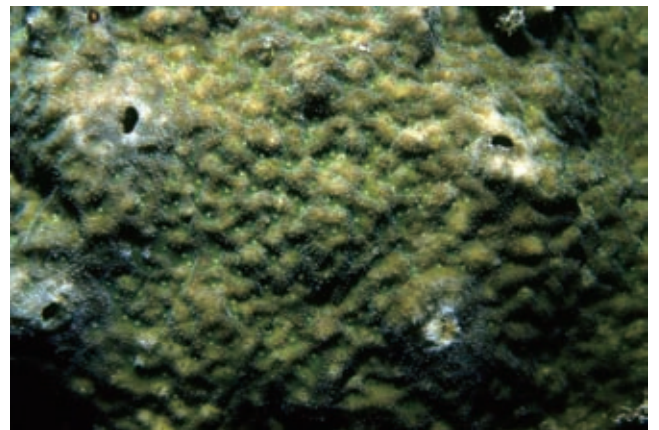
Widely distributed throughout the Indo-Pacific, from east Africa to French Polynesia.

Remarks

This species is similar to *P. profundacella*, but the latter is distinguished by their less acute walls and more distinct corallite centers. It may also superficially resemble *Pavona venosa* and *Gardineroseris planulata*, but the three are easily distinguished by their calicular structures.



A close view of the colony showing short valleys.



A portion of a *Psammocora haimeana* colony.

Psammocora profundacella Gardiner, 1898

Chinese Name	深紋沙珊瑚
Family	Fungiidae
Publication	<i>Psammocora profundacella</i> Gardiner (1898)
Synonymy	<i>Psammocora profundacella</i> Vaughan (1918); Yabe et al. (1936); Nemenzo (1955); Veron & Pichon (1976); Veron (1986); Nishihira & Veron (1995); Veron (2000)



A submassive colony of *Psammocora profundacella*.

Taxonomic Description & Diagnosis

Colonies are mostly submassive, but may be encrusting or thick laminar plates. Corallites are 2-3 mm in width, single or in short series, and separated by well-defined intermediate ridges. Ridges range from being inconspicuous, to well-developed collines up to 2 mm in height, with upper edges either rounded or sharp. The number of septa decreases from corallite margins towards the center due to fusion between septa; thus only 8-12 septa reach the fossa. Septa is petaloid and perforate, with dentate margins and spinulose sides. Corallite walls are basically synapticular, instead of thecal, but it is solid. At least one row of synapticulariae is present on each side of the wall. Columella is absent or reduced to a few papillae.

Living colonies are uniformly grey, tan, green or brown, usually with dark corallite centers.

Ecology

Occurs in shallow reef environments, but usually 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 Easter Island.

Remarks

This species is similar to *P. haimeana*, but the latter is distinguished by their more acute walls and less distinct corallite centers. It may also resemble *P. superficialis*, the latter has less distinctive corallites and less developed ridges.



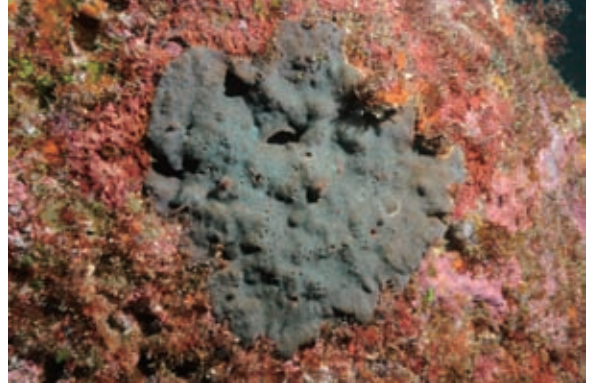
A close view of the colony surface.



Skeleton of *Psammocora profundacella*.

Psammocora superficialis Gardiner, 1898

- Chinese Name** 表面沙珊瑚
- Family** Fungiidae
- Publication** *Psammocora superficialis* Gardiner (1898)
- Synonymy** *Psammocora superficialis* Yabe et al. (1936); Crossland (1952); Veron & Pichon (1976); Veron (1986); Nishihira & Veron (1995); Veron (2000)
Psammocora vaughani Yabe et al. (1936)



An encrusting colony of *Psammocora superficialis*.

Taxonomic Description & Diagnosis

Colonies are encrusting to plate-like, sometimes with submassive centers, covered with irregularly scattered ridges which may be of little or no relation to the corallites. The development of ridges may be abortive, reduced to low collines between corallites or displaying the *profundacella-haimeana* condition. Length of ridges varies from mere hydno-phoroid protuberances to being continuous. Corallites are regularly distributed, with petaloid septa which are less conspicuous in lightly calcified colonies. Septa often fuse, and only 6-12 reach the central fossa. Corallite wall is composed of a row of synapticulae. In heavily calcified colonies, the intercalicular areas are covered by undifferentiated, strongly echinulated coenenchyme. Columella is reduced to a central spine.

Living colonies are uniform pale to dark grey, tan or brown, but may also be brightly colored sometimes.

Ecology

Occurs in a wide range of environments, common but inconspicuous.

Occurrence

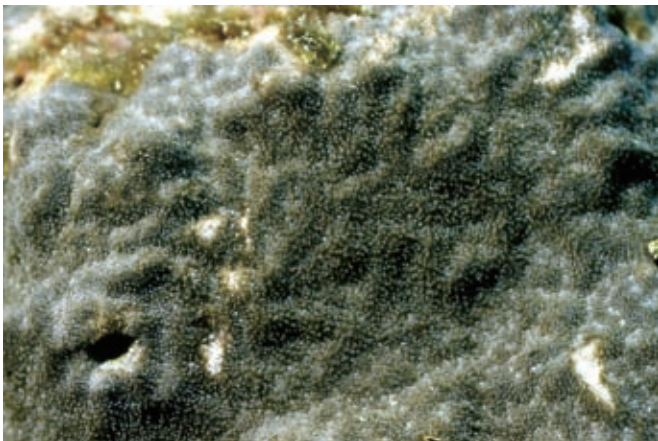
All reef areas around Taiwan and offshore islets.

Distribution

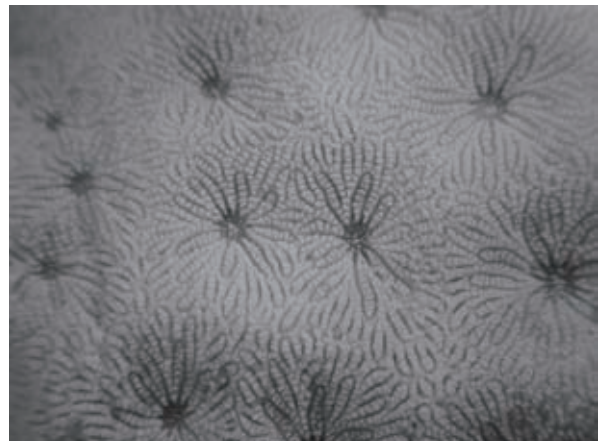
Widely distributed throughout the Indo-Pacific, from east Africa to the west coast of America.

Remarks

This species is similar to *P. profundacella*, but the latter is distinguished by their more developed ridges in relation to the corallites.



A close view of the colony surface.



Skeleton of *Psammocora superficialis* showing the petaloid septa.

Coscinaraea columna (Dana, 1846)

Chinese Name 柱形篩孔珊瑚
Family Fungiidae
Publication *Psammocora columna* Dana (1846)
Synonymy *Psammocora fossata* Ma (1959)
Coscinaraea columna Yabe & Sugiyama (1935); Yabe et al. (1936); Wells (1955); Nemenzo (1955); Veron & Pichon (1980); Veron (1986); Nishihira & Veron (1995); Veron (2000)



A massive colony of *Coscinaraea columna*.

Taxonomic Description & Diagnosis

Colonies are encrusting, foliaceous to massive and claviform. Corallites are 1.5-6 mm in diameter, usually 3-4 mm in diameter. They may be single or aligned in valleys up to 5 cm in length, including up to 12 centers. Collines are of variable heights, from being superficial to up to 4 mm high; and vary in shapes, from rounded to subacute. Up to 40 septa are present at the periphery, with fused inner margins, resulting in 12-15 septa reaching the central fossa. Septal margins are composed of compound trabeculae, bearing numerous hirsute granules. Septal sides are granulated and perforate. Corallites walls are synapticulothecal. Columella is conspicuous and composed of upward projecting papillae.

Living colonies display a variety of colors, usually bright greenish-yellow, brown, grey and purple.

Ecology

Occurs in a wide range of shallow reef environments, more common in protected habitats.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

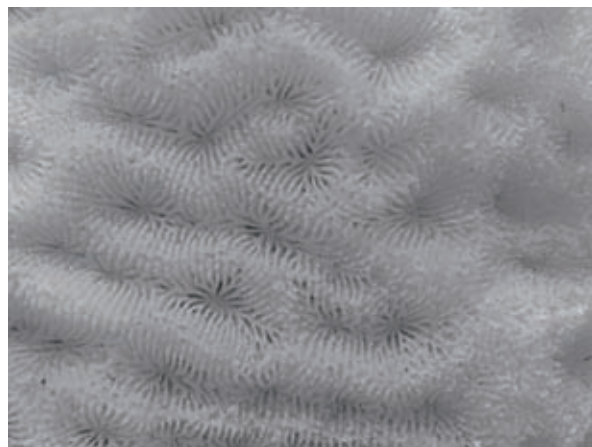
Widely distributed throughout the Indo-Pacific, from the Red Sea to French Polynesia.

Remarks

This species is similar to *Coscinaraea exesa*, but the latter is columnar, and is distinguished by having larger, shallow corallites, with thicker and less numerous septa.



Collines and corallites in valleys.



A close view of skeletal structure.

Coscinaraea crassa Veron & Pichon, 1980

Chinese Name 殼狀篩孔珊瑚

Family Fungiidae

Publication *Coscinaraea crassa* Veron & Pichon (1980)

Synonymy *Coscinaraea crassa* Veron & Pichon (1980); Veron (1986); Nishihira & Veron (1995); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are foliaceous, with solid and unifacial plates. Colony centers are thickened and up to 4 cm in thickness, while the periphery is only about 5 mm. Corallites are shallow, arranged in concentric rows parallel to the periphery, but older, more central corallites are in shorter, more irregular series. Collines are very low and irregularly developed, 5-11 mm in width, sometimes expand into low rounded protuberance of 1-1.5 cm across and separate series of corallites. Axial fossa averages 6 mm in diameter, but may be up to 10 mm. Septo-costae alternate in height and thickness. 16-32 septa are present in a corallite; those of higher orders sometimes fuse with those of lower ones. Septal margins and sides are granulated, with few perforations on the upper parts. Corallite walls are synapticulothecal. Columella is absent or well-developed, composed of a single, lateral papillae or a series of fused granules.

Living colonies are usually pale brown.

Ecology

Occurs in shallow reef environments or lower reef slope in turbid environments. Colony formation is initially circumoral, followed by marginal budding.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

Distributed throughout the Indo-Pacific, from Indonesian Archipelago to Vanuatu.

Remarks

This species is superficially similar to *Podabacia crustacea*, but the two have distinctly different septal ornamentations.



A foliaceous colony of *Coscinaraea crassa*.



A close view showing corallites and collines.

Coscinaraea exesa (Dana, 1846)

Chinese Name 大篩孔珊瑚
Family Fungiidae
Publication *Psammocora exesa* Dana (1846)
Synonymy *Psammocora exesa* Yabe & Sugiyama (1935); Yabe et al. (1936); Crossland (1952); Nemenzo (1955); Veron & Pichon (1980); Veron (1986); Nishihira & Veron (1995); Veron (2000)



The flat top of a columnar colony.

Taxonomic Description & Diagnosis

Colonies are columnar or claviform, with a flat top, which may reach several meters across. Corallites are up to 6 mm in diameter. They are shallow, becoming superficial near the base of the columns, but may align in short valleys towards the tip of the columns. 18-24 septa are present at the periphery, all with fused inner margins, resulting in approximately 8 septa reaching the central fossa; thus forming the petaloid shape of enclosed septa. Septa are granulated, but the granulations tend to develop into distinct lobes toward the top of the columns. Coenosteum is echinulate, extensive and very porous, echinulate separates corallites on horizontal parts of the colony. Columella is composed of rounded, upward projecting, papillary trabeculae.

Living colonies are uniform dark grey or brown.

Ecology

Occurs in shallow reef environments, colonies may reach several meters in diameter in lagoons.

Occurrence

All reef areas around Taiwan and offshore islets, but more common in northern Taiwan.

Distribution

Widely distributed throughout the Pacific, from the Indonesian Archipelago to French Polynesia.

Remarks

This species is similar to *Coscinaraea columna*, but the latter may not be columnar, and is distinguished by having smaller, deeper corallites, with thinner and more numerous septa. It is also similar to *Psammocora digitata*, but the former is distinguished by their compound trabeculae.



A portion of a claviform colony with shallow corallites.



Skeletal structure of *Coscinaraea exesa*.

Oulastrea crispata (Lamarck, 1816)

Chinese Name 黑星珊瑚

Family Faviidae

Publication *Astrea crispata* Lamarck (1816)

Synonymy *Oulastrea crispata* Veron et al. (1977); Nishihira & Veron (1995); Veron (2000)

Taxonomic Description & Diagnosis

This is the only species of the genus. Colonies are encrusting and grow to only a few cm across. Corallites are similar to those of a small *Montastrea*. They are of uniform size and are closely compacted, with long and short septa alternate. Paliform lobes are well developed. Tentacles are sometimes extended during the day.

Living colonies are black with white upper margins to the septa. Dried skeletons are also black and white.

Ecology

Found in intertidal and subtidal turbid waters, attached to wave washed rocks, and it is uncommon.

Occurrence

Eastern Taiwan and Penghu Islands.

Distribution

Distributed from the east Indian Ocean to the west Pacific, from Bay of Bengal to Solomon Islands, and from the Great Barrier Reef to Japan.



A colony of *Oulastrea crispata*.



A close view of corallites of *Oulastrea crispata*.

Lobophylliidae

This newly established family contains six genera (*Scolymia*, *Lobophyllia*, *Cynarina*, *Symphyllia*, *Australomussa*, *Acanthastrea*) from the traditional Mussidae and two genera (*Oxypora*, *Echinophyllia*) from the traditional Pectiniidae, mainly based on the results of molecular phylogenetic analyses (Fukami et al. 2008). *Lobophyllia* is designated type genus of this family.

Fukami et al. (2008) showed that the traditional Mussidae is a polyphyletic group and the Atlantic and Indo-Pacific species form two clearly separated clades. They also pointed out that *Acanthastrea* is a monophyletic clade distantly related to other Pacific ‘mussids’ and might be considered as a separate family or subfamily. However, *Acanthastrea* is retained here with other Indo-Pacific ‘mussid’ genera and *Oxypora* and *Echinophyllia*.

Simplified key to genera of Lobophylliidae

Coralla solitary and monocentric

Septa usually arranged in five or six orders.....*Scolymia*

Septa usually arranged in three orders.....*Cynarina*

Colonies massive

Corallites phaceloid.....*Lobophyllia*

Corallites meandroid with long valleys, 12-60 mm in width.....*Symphyllia*

Corallites subcerioid, may form short valleys, 8-20 mm in width.....*Australomussa*

Corallites cerioid to subplocoid.....*Acanthastrea*

Colonies foliaceous

Slit-like pores are present between costae, near colonies margins.....*Oxypora*

No intercostal pores.....*Echinophyllia*



A colony of *Lobophyllia*.



A massive colony of *Symphyllia recta*.

Lobophyllia pachysepta Chevalier, 1975

Chinese Name 厚片瓣葉珊瑚

Family Lobophylliidae

Publication *Lobophyllia pachysepta* Chevalier (1975)

Synonymy *Lobophyllia pachysepta* Veron & Pichon (1980); Veron (1986), Nishihira & Veron (1995); Veron (2000)

Taxonomic description and diagnosis

Colonies are small, with short, widely spaced branches. Corallites are phaceloid and monocentric, except in the process of division. Corallites outline are circular to irregular, usually 4-5 cm across. Septa are arranged in four indistinct orders, with greatly thickened first order septa bearing 3-5 irregular, long, lobate dentations. Higher order septa are thinner, with finer, more numerous dentations. All septa bear fine, perforate dentations intermingled with the large, spongy, diffuse columella. Septal sides are all finely granulated, as well as the tops of all dentations. Costae are poorly developed, with irregular, echinulate costal spines.

Living colonies are uniformly dark colored, with cream or yellow primary septa.

Ecology

Usually found on protected upper reef slopes and lagoons.

Occurrence

Southern Taiwan, Ludao, and Dongsha Atoll.

Distribution

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

Remarks

This species is readily recognized underwater by its color. It is most similar to *L. corymbosa*, but the former is easily distinguished by its first order septa that are greatly thickened with large, lobate dentations.



A colony of *Lobophyllia pachysepta*.



A close view of the corallites.

Lobophyllia corymbosa (Forskål, 1775)

Chinese Name 束形瓣葉珊瑚

Family Lobophylliidae

Publication *Madrepora corymbosa* Forskål (1775)

Synonymy *Mussa corymbosa* Gardiner (1904)

Lobophyllia corymbosa Yabe & Sugiyama (1935); Yabe et al. (1936); Eguchi (1938); Crossland (1952); Wells (1954); Stephenson & Wells (1955); Nemenzo (1959); Ma (1959); Chevalier (1975); Scheer & Pillai (1975); Veron & Pichon (1980); Veron (1986), Nishihira & Veron (1995); Veron (2000)

Taxonomic description and diagnosis

Colonies are hemispherical. Corallites are phaceloid with short, compact branches, monocentric to tricentric, but never meandroid. Calices are deep and walls are thick, which are of constant thickness of about 4 mm. Septa may be arranged in two alternating orders or four distinct orders. 30-50 percent of the septa are first order septa, which are thicker and more exsert, with regular lobate dentations. Dentations become increasingly long and thin towards the inner part of first order septa; become long, fine, and more irregular on higher order septa. All septal margins are finely serrated or granulated, and septal sides are finely granulated. Columella is diffuse and trabecular.

Living colonies are grey, greenish-brown or mustard, usually with pale oral discs.

Ecology

Usually found on upper reef slopes.

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.

Remarks

This species is similar to *L. hemprichii*, but the former is never meandroid, with smaller corallites, relatively regular first order septa, and better developed costae.



A massive colony of *Lobophyllia corymbosa*.



A close view of the corallites.

Lobophyllia hemprichii (Ehrenberg, 1834)

Chinese Name 聯合瓣葉珊瑚

Family Lobophylliidae

Publication *Manicina hemprichii* Ehrenberg (1834)

Synonymy *Mussa sinuosa* Vaughan (1918); Yabe & Sugiyama (1932)

Lobophyllia hemprichii Yabe & Sugiyama (1935); Yabe et al. (1936); Ma (1937, 1959); Eguchi (1938); Crossland (1952); Wells (1954); Stephenson & Wells (1955); Nemenzo (1959); Chevalier (1975); Veron & Pichon (1980); Veron (1986), Nishihira & Veron (1995); Veron (2000)

Lobophyllia costata Yabe & Sugiyama (1935); Yabe et al. (1936); Ma (1937, 1959); Eguchi (1938); Wells (1954); Stephenson & Wells (1955); Chevalier (1975)

Taxonomic description and diagnosis

Colonies are hemispherical to flat, often attaining several meters in diameter. Corallites are phaceloid, being monocentric to highly meandroid, or a mixture of both, with the length of the valley being determined by the competition for space between branches of the same or neighboring colonies. Septa may be arranged in two alternating orders, four distinct orders, or with the orders indistinguishable. Half of the septa belong to the first order, which are very exsert, with 2-10 large lobate to echinulate dentations. Dentations become finer and more numerous in higher order septa. All septal margins are finely serrated, and septal sides are finely granulated. Columella is usually trabecular. Costae usually appear as parallel ridges with rows of sharp dentations.

Living colonies may be almost any colors, each polyp are usually distinguished into three different colored, concentric zones: the central oral disc, corallite wall or the inner valley, and the outer wall.

Ecology

Usually found on upper reef slopes.

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.

Remarks

This species is similar to *L. corymbosa*, but the latter is never mendroid.



A colony of *Lobophyllia hemprichii*.



A close view of the meandroid corallites.

Lobophyllia flabelliformis Veron, 2000

Chinese Name 褶曲瓣葉珊瑚

Family Lobophylliidae

Publication *Lobophyllia flabelliformis* Veron (2000)

Taxonomic description and diagnosis

Colonies are massive, usually large, and dome-shaped, hemispherical to flat. Corallites are flabello-meandroid, with wide valleys that are closely compacted, but have no walls in common. Approximately half of the septa are relatively thicker and very exert, with large lobate to echinulate dentations. Septal margins are finely serrated, and septal sides are finely granulated. Columella is large and trabecular.

Living colonies are usually uniformly grey-brown or dark green. Thick fleshy mantle of the polyps is covered by elongate papillae resembling tentacles. Usually the mantle obscures the underlying skeletal structures, unless it retracts when touched.

Ecology

Found in most reef environments, but it is uncommon.

Occurrence

Nanwan Bay, Ludao, and Dongsha Atoll.

Distribution

Distributed in the west Pacific, from the Great Barrier Reef to Okinawa.

Remarks

This species resembles *Symphyllia* species underwater, but the former is easily distinguished when the thick fleshy mantle is touched and retracted, revealing the underlying skeletal structure, showing no common walls between the valleys.



A living colony of *Lobophyllia flabelliformis*.



A close view of corallites with tentacles extending.

Lobophyllia hataii Yabe, Sugiyama & Eguchi, 1936

Chinese Name 盃瓣葉珊瑚

Family Lobophylliidae

Publication *Lobophyllia hataii* Yabe et al. (1936)

Synonymy *Lobophyllia hataii* Eguchi (1938); Ma (1959); Nemenzo (1959); Chevalier (1975); Veron & Pichon (1980); Veron (1986), Nishihira & Veron (1995); Veron (2000)

Taxonomic description and diagnosis

Colonies are massive, partly flabellate and partly meandroid. Valleys are very wide and shallow, partly sinuous and partly radiating, with flat valley floors that are at least as wide as the collines. As valley floors get flatter and wider, the centers are more irregularly spaced, sometimes may occur in two rows. Septa are in three orders. First order septa are relatively thick and exsert, bearing 4-8 large lobate or echinulate dentations, the largest of which is usually developed into paliform lobe adjacent to the columella. Higher order septa are increasingly thinner, less exsert, with finer dentations. All septal margins are finely serrated, and septal sides are finely granulated. Columella is trabecular or large and spongy. Costae usually consist of vertical rows of very elongate spines.

Living colonies are usually brown or green, with valley floors and walls usually of contrasting colors.

Ecology

Mostly found on protected upper reef slopes, but it is uncommon.

Occurrence

Nanwan Bay, Ludao, and Dongsha Atoll.

Distribution

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

Remarks

This species resembles *Symphyllia agaricia*, but the former is distinguished by its finer septa and septal ornamentation, and the shallower valleys.



A massive colony of *Lobophyllia hataii*.



A close view of the corallites.

Symphyllia agaricia Edwards & Haime, 1849

Chinese Name 蓮形合葉珊瑚

Family Lobophylliidae

Publication *Symphyllia agaricia* Edwards & Haime (1849)

Synonymy *Symphyllia agaricia* Matthai (1928); Yabe & Sugiyama (1935); Yabe et al. (1936); Nemenzo (1959); Scheer & Pillai (1974); Veron & Pichon (1980); Veron (1986), Nishihira & Veron (1995); Veron (2000)

Taxonomic description and diagnosis

Colonies are massive, with sinuous or radiating valleys of indefinite length and large width averaging 35 mm. Septa are not arranged in distinct orders, vary greatly in thickness, and spaced with a density of 8-10 septa per cm. Principal septa are thick and coarsely dentate, with the number of dentations increases with decreasing septal width. Columella is poorly developed, consisting of inner parts of septa that are twisted together clockwise. Columellae are in two rows, linked longitudinally by lamellar linkages. Septa of adjacent valleys are linked by a fine lamellar ridge along the top of the collines.

Living colonies are usually uniformly brown, green, red, or composed of two colors.

Ecology

Usually found on exposed upper reef slopes, but it is uncommon.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

Widely distributed throughout the Indo-Pacific, from Mozambique Channel to Samoa.

Remarks

This species is readily distinguished by the wide valleys and columella centers that are almost always arranged in double rows. When colonies are exposed to strong wave action, their septa may be arranged in two to four orders, with the primary septa being extremely dentate.



A massive colony of *Symphyllia agaricia*.



A close view of colony edge.

Symphyllia radians Edwards & Haime, 1849

Chinese Name	輻紋合葉珊瑚
Family	Lobophylliidae
Publication	<i>Symphyllia radians</i> Edwards & Haime (1849)
Synonymy	<i>Symphyllia radians</i> Matthai (1928); Yabe & Sugiyama (1935); Yabe et al. (1936); Crossland (1952); Nemenzo (1959); Scheer & Pillai (1974); Chevalier (1975); Veron & Pichon (1980); Veron (1986), Nishihira & Veron (1995); Veron (2000)



A hemispherical colony of *Symphyllia radians*.

Taxonomic description and diagnosis

Colonies are flat with relatively straight and radiating valleys, to hemispherical with irregularly sinuous valleys of indefinite length. The valley width may reach 27 mm with narrow walls in protected biotopes, and branches may form when valley width exceeds 22 mm. Septa are usually not arranged in orders, mostly with thick and thin septa alternating or occurring in constant proportion. First order septa are thick and strongly dentate, with 3-6 large dentations on septal margins. Higher order septa are thinner, with finer, more numerous dentations. Columella may be twisted trabecular or spongiose. Ambulacral groove is well defined, situated along the top of the collines.

Living colonies display a wide variety of colors, mostly green, grey, and red, with valley floors and walls often in different colors.

Ecology

Usually found on upper reef slopes and fringing reefs, where it is common.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

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

Remarks

This species is similar to *S. recta* and *S. agaricia*, but the three species are easily distinguished by the differences in valley widths, with *S. agaricia* having the widest valley, and *S. recta* being the narrowest.



A portion of the colony edge with sinuous valleys.



Skeleton of *Symphyllia radians*.

Symphyllia recta (Dana, 1846)

Chinese Name 直紋合葉珊瑚

Family Lobophylliidae

Publication *Mussa recta* Dana (1846)

Synonymy *Symphyllia recta* Matthai (1928); Yabe & Sugiyama (1935); Yabe et al. (1936); Eguchi (1938); Crossland (1952); Nemenzo (1959); Ma (1959); Scheer & Pillai (1974); Veron & Pichon (1980); Veron (1986); Veron (2000)

Symphyllia nobilis Vaughan (1918); Wells (1954); Stephenson & Wells (1955); Chevalier (1975)

Taxonomic description and diagnosis

Colonies are hemispherical or low, dome-shaped, with sinuous, irregularly ramifying valleys and thick, rounded collines. Corallites are meandroid. Septa are arranged in two alternating or three indistinct orders. First order septa are thick, tapering towards the valley centers, with strongly dentate upper margins. Higher order septa are thinner and less dentate. Columella is small, consisting of inner parts of first order septa that are twisted together clockwise. Columella centers are regularly spaced, at intervals of approximately 16 mm. Ambulacral groove is well defined, situated along the top of the collines.

Living colonies display a wide range of colors, mostly dull brown, green, and grey, sometimes red, either mottled, or with walls and valley floors in contrasting colors.

Ecology

Usually found on upper reef slopes and fringing reefs, where it is common.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

Widely distributed throughout the Indo-Pacific, from the Mozambique Channel to Samoa.

Remarks

This species is similar to *S. radians*, but the former is distinguished by its smaller, more sinuous valleys, and finer septal dentations. However, colonies from very exposed biotopes have short valleys that are relatively deep with acute collines. They may also be monocentric with irregularly shaped corallites. On the other hand, colonies from semi-protected biotopes have very shallow valleys, with thin, uniform septa and indistinct columella.



A hemispherical colony of *Symphyllia recta*.



A close view showing the meandroid corallites.

Symphyllia valenciennesii Edwards & Haime, 1849

Chinese Name 華倫合葉珊瑚

Family Lobophylliidae

Publication *Symphyllia valenciennesii* Edwards & Haime (1849)

Synonymy *Symphyllia valenciennesii* Matthai (1928); Yabe et al. (1936); Ma (1959); Chevalier (1975); Veron & Pichon (1980); Veron (1986), Nishihira & Veron (1995); Veron (2000)

Taxonomic description and diagnosis

Colonies are flat to dome-shaped, with radiating valleys that are mostly straight and up to 4 cm in width, with steep sides and flat valley floors. Septa are not arranged in distinct orders and vary greatly in thickness. Principal septa are coarse and up to 2 mm thick, 12 mm exsert. Columella is large and conspicuous, compact and spongy, up to 10 mm across. There are up to seven dentate laminae link the columellae. Paliform crowns are sometimes formed by the innermost, largest septal dentations. Deep grooves are usually present between adjacent valleys.

Living colonies are usually brown, grey or mottled, with valleys floors and walls of contrasting colors.

Ecology

Occurs on protected lower reef slopes with weak wave action and rocky foreshores of subtropical locations.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

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

Remarks

This species is similar to *Symphyllia agaricia*, but the former is easily distinguished by the much lower tendency to form double rows of columellae and the very wide, flat valley floors. Immature colonies of *S. valenciennesii* may also resemble *Lobophyllia hatai*, both with flat, open central areas and little valley formation, but the former may be distinguished by their coarser septa and lower tendency for double rows of columellae.



A living colony of *Symphyllia valenciennesii*.



A close view shows corallites in double rows.

Australomussa rowleyensis Veron, 1985

Chinese Name	澳紋珊瑚
Family	Lobophylliidae
Publication	<i>Australomussa rowleyensis</i> Veron (1985)
Synonymy	<i>Australomussa rowleyensis</i> Veron (1986); Nishihira & Veron (1995); Veron (2000)

Taxonomic description and diagnosis

This is the only species of the genus. Colonies are helmet- or dome-shaped, sometimes flattened. Corallites are subcerioid with thick walls, forming shallow, conical depression. They are usually monocentric, but sometimes may form short, shallow valleys 8-20 mm wide. Septa and costae are thick and sturdy, with large, blunt dentations. Columella is conspicuous.

Living colonies display a wide range of colors, from bright red, yellow, green to uniform blue-grey or cream and green forming concentric patterns on the valleys. Colonies are covered by fleshy tissues, but those covering the septa are usually distinct in color and/or texture from those covering the costae.

Ecology

Usually found on protected lower reef slopes.

Occurrence

Southern Taiwan

Distribution

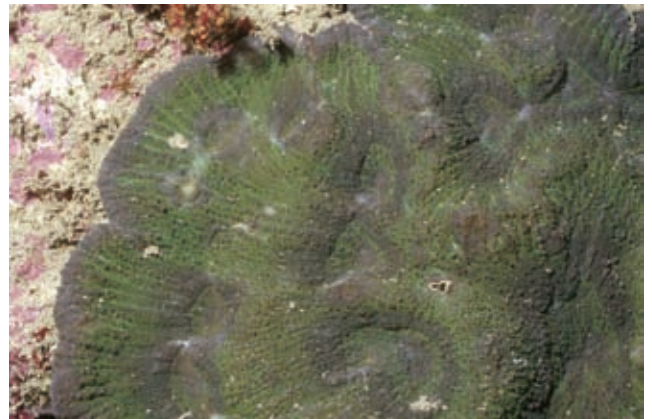
Distributed from the east Indian Ocean to the west Pacific.

Remarks

This species has corallites similar to those of *Scolymia vitiensis*, but the two species have very different colony growth forms.



A colony of *Australomussa rowleyensis*.



A close view of the corallites.

Cynarina lacrymalis (Edwards & Haime, 1848)

Chinese Name	圓冠珊瑚
Family	Lobophylliidae
Publication	<i>Caryophyllia lacrymalis</i> Edwards & Haime (1848)
Synonymy	<i>Cynarina savignyi</i> Crossland (1952) <i>Protolobophyllia japonica</i> Yabe & Sugiyama (1931); Yabe et al. (1936); Ma (1959) <i>Protolobophyllia sinica</i> Ma (1959) <i>Cynarina lacrymalis</i> Utinomi (1971); Veron & Pichon (1980); Veron (1986), Nishihira & Veron (1995); Veron (2000)

Taxonomic description and diagnosis

Corals are monocentric, oval or circular, with a broad base for attachment, or a pointed base when free-living. Septa are usually arranged in three orders, and sometimes a rudimentary order is present. Primary septa are thick, up to 7 mm, and extremely exsert, with large, lobate dentations. Septal sides and margins are granulated. Columella is large and spongy. All septa reaching the columella bear paliform lobes, which are lobed or coarsely serrated, forming a distinct, low, broad paliform crown.

Living polyps are colorful, resulting in a large variety of color patterns. Usually the mantle and the oral discs are translucent, so the underlying skeleton can be seen. Others may be mixtures of green, brown or pink.

Ecology

Usually found in protected reef environments and deep sandy substrates, being common where light intensity is marginal for hermatypic corals. During the day, the mantle is inflated with water, forming a translucent bulbous swelling over the primary septa, but retracts at night when the tentacles are extended. Where illumination is poor, the mantle may be over twice the diameter of the skeleton.

Occurrence

Southern Taiwan, Ludao, and Lanyu.

Distribution

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

Remarks

This is the only species of the genus. Free living corals are sometimes found on sandy substrate.



A corallum of *Cynarina lacrymalis*.



A close view of the polyp with inflated mantle and extending tentacles.

Scolymia vitiensis Brüggemann, 1877

- Chinese Name** 葡萄薊珊瑚
Family Lobophylliidae
Publication *Scolymia vitiensis* Brüggemann (1877)
Synonymy *Lithophyllia vitiensis* Crossland (1952)
Protolobophyllia japonica Yabe & Sugiyama (1935)
Parascolymia vitiensis Chevalier (1975)
Scolymia vitiensis Veron & Pichon (1980); Veron (1986), Nishihira & Veron (1995); Veron (2000)

Taxonomic description and diagnosis

Corals are usually monocentric and solitary in subtropical waters, with a diameter of usually less than 6 cm. In tropical waters, they may become polycentric and colonial, with a diameter larger than 14 cm. Coralla may be flat, convex or concave, with the calice forming shallow, conical depression. Septa are usually in five or six orders, and they become thinner and smaller, with finer dentations as the order increases. Lower order septa are strongly and irregularly dentate. Columella is large and spongy.

Living corals are usually dark, mostly green or brown, with thin and non-fleshy polyps.

Ecology

Found in most reef environments, but are usually uncommon. Budding may occur within the calice depression, or at the periphery of large, usually convex corals.

Occurrence

All reef areas in Taiwan and its offshore islets.

Distribution

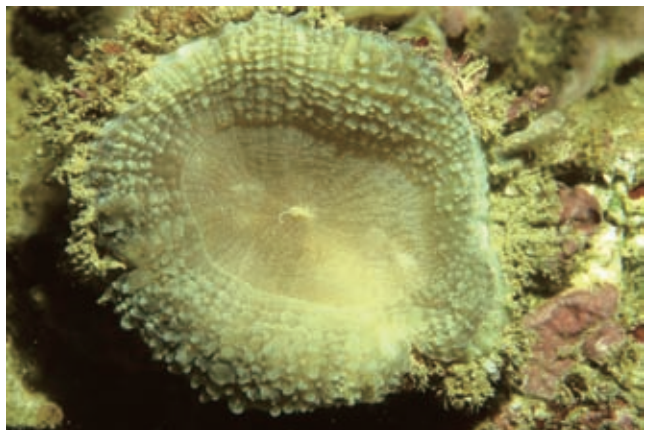
Widely distributed throughout the Pacific, from the Indonesian Archipelago to French Polynesia. Also recorded from west Indian Ocean from the Maldives to Madagascar.

Remarks

This species is similar to *Lobophyllia* species when immature, but the former is distinguished by having a central conical depression, with larger dentations. It is also distinguished from *Cynarina lacrymalis* by the strongly dentate costae and the low paliform crown of the latter.



A corallum of *Scolymia vitiensis*.



A close view of the polyp.

Echinophyllia aspera (Ellis & Solander, 1786)

- Chinese Name** 粗糙棘葉珊瑚
- Family** Lobophylliidae
- Publication** *Madrepora aspera* Ellis & Solander (1786)
- Synonymy** *Echinophyllia aspera* Wells (1954); Nemenzo (1959); (pars) Chevalier (1975); (pars) Pillai & Scheer (1976); Veron & Pichon (1980); Veron (1986); Nishihira & Veron (1995); Veron (2000)



A foliaceous colony of *Echinophyllia aspera*.

Taxonomic description and diagnosis

Colonies are encrusting to foliaceous, with thick centers and thin margins. As colonies grow large, the center may become hillocky or submassive, while the peripheral parts become contorted, frequently forming overlapping whorls and tiers. Corallites are slightly protuberant, usually inclined towards the periphery, and of varying sizes and shapes. A central corallite is usually distinguished in colonies of < 20 cm in diameter. The number of septa also varies greatly, and septa are not arranged in orders. Major septa radiate from the columella, and are evenly exsert, up to 5 mm, with 1-3 large dentations on their upper margins. Costae are thick, with pointed, spiny dentations. Columella is trabecular or compact.

Living colonies are usually brown, green or red, often mottled, usually with red or green oral discs.

Ecology

Found in most reef environments, most often on lower reef slopes, fringing reefs and lagoons.

Occurrence

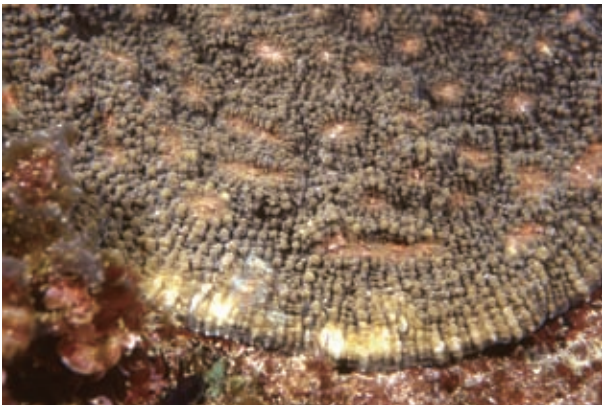
All reef areas around Taiwan and offshore islets.

Distribution

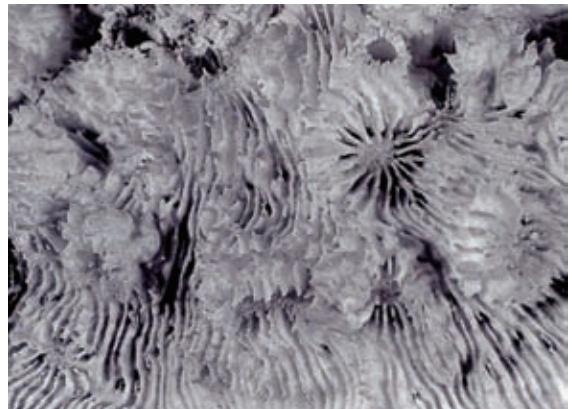
Widely distributed throughout the Indo-Pacific, from the Red Sea to French Polynesia.

Remarks

This species is similar to *Echinophyllia orpheensis*, but the latter is distinguished by its usually much more massive appearance and the development of a paliform crown. It is also similar to *E. echinata*, but the latter is distinguished by its large central corallite, and the prominent first and second order septo-costae. It may also be confused with *Oxypora lacera* underwater.



A close view of colony edge.



Skeleton of *Echinophyllia aspera*.

Echinophyllia echinata (Saville-Kent, 1871)

Chinese Name	多刺棘葉珊瑚
Family	Lobophylliidae
Publication	<i>Tridacophyllia echinata</i> Saville-Kent (1871)
Synonymy	<i>Echinophyllia echinata</i> Chevalier (1975); Veron (1986); Nishihira & Veron (1995); Veron (2000)



A foliaceous colony of *Echinophyllia echinata*.

Taxonomic description and diagnosis

Colonies are foliaceous, with thin, flat to vase-shaped plates. A central corallite is usually conspicuous, with shallow, widely spaced radial corallites that are usually elliptical and inclined towards the periphery. Septa of the central corallite may be arranged in hexamerous cycles. Those of the first two orders are thicker and more exsert, where large paliform lobes may develop. All septa have 1-3 large, lobed, dentations. Septa of the radial corallites are arranged in two to four orders. The first order septa are thicker, more exsert, usually having a single, large paliform dentation. Columella is large, up to 6 mm in diameter, and compact in the central corallite; whereas it may be compact or trabecular in radial corallites. Costae all radiate from the central corallite. They may be glabrous or with spinulated or granulated dentations.

Living colonies are usually mottled brown, green and red.

Ecology

Occurs in protected reef environments, usually found on vertical or overhang substrate and lower reef slopes.

Occurrence

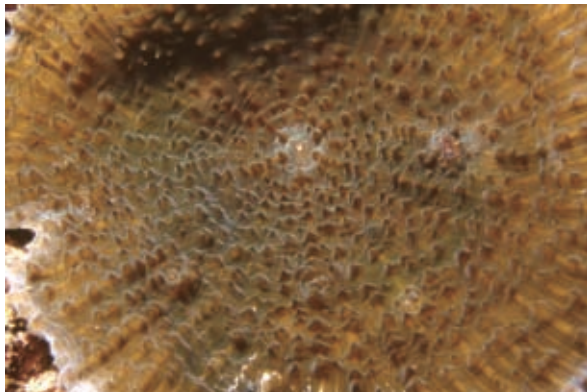
All reef areas around Taiwan and offshore islets.

Distribution

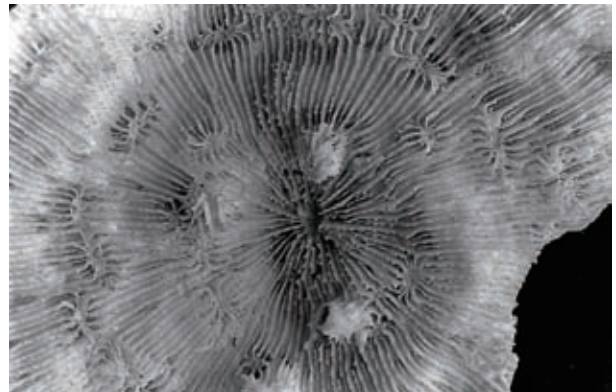
Widely distributed throughout the Indo-Pacific, from the Red Sea to French Polynesia.

Remarks

This species is similar to *E. aspera*, but this species is distinguished by its large central corallite, and the prominent first and second order septo-costae. Though the radial corallites resembles more to those of *Oxypora lacera*. This species also resembles immature *Mycedium* spp.



A close view showing central and radial corallites.



Skeleton of *Echinophyllia echinata*.

Echinophyllia echinoporoides Veron & Pichon, 1980

Chinese Name	多刺棘葉珊瑚
Family	Lobophylliidae
Publication	<i>Echinophyllia echinoporoides</i> Veron & Pichon (1980)
Synonymy	<i>Echinophyllia echinoporoides</i> Veron (1986); Nishihira & Veron (1995); Veron (2000)

Taxonomic description and diagnosis

Colonies are foliaceous, with thin margins and centers up to 3 cm thick. Corallites are irregularly distributed, but those of the same age may form concentric rows. They are plocoid to sub-plocoid, circular in the colony center and becoming irregularly outlined toward the periphery. Calices average 3.4 mm in diameter. Septa are arranged in two orders, but the second order are frequently reduced to a few spines on the theca. First order septa bear 1-4 paliform dentations, with the innermost slanting towards the columella, which is compact. Septal sides are finely granulated. Costae may radiate from the colony center and be perpendicular to the margin, or radiate from corallites and be sinuous or crenellated. Costae have fine, spiny to beaded dentations.

Living colonies display a wide range of colors, usually a uniform cream to dark brownish-green.

Ecology

Occurs in most reef environments, especially in turbid waters on protected, steeply sloping substrates, but this species is uncommon.

Occurrence

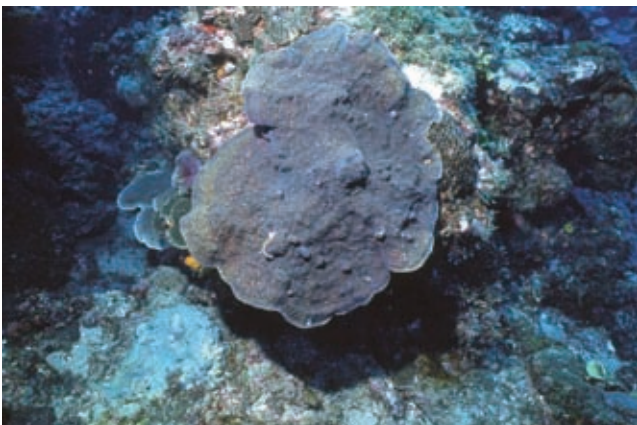
Nanwan Bay, Xiaoliuchiu, Penghu Islands.

Distribution

Mainly distributed throughout the west Pacific, from Okinawa to the Great Barrier Reef.

Remarks

This species is similar to *Oxypora lacera*, but the former is distinguished by the lack of alveolar perforation. This species also superficially resembles the faviid *Echinopora lamellosa*, but are easily distinguished by the differences in their costae.



A foliaceous colony of *Echinophyllia echinoporoides*.



A close view of the colony.

Echinophyllia orpheensis Veron & Pichon, 1980

Chinese Name	簇狀棘葉珊瑚
Family	Lobophylliidae
Publication	<i>Echinophyllia orpheensis</i> Veron & Pichon (1980)
Synonymy	<i>Oxyphyllia aspera</i> var. <i>tosaensis</i> Yabe & Eguchi (1935); Yabe et al. (1936) <i>Oxyphyllia aspera</i> var. <i>sugiyamai</i> Yabe & Eguchi (1935); Yabe et al. (1936); (<i>pars</i>) Ma (1959) <i>Oxyphyllia aspera</i> Crossland (1952) <i>Echinophyllia aspera</i> var. <i>sugiyamai</i> Pillai & Scheer (1976) <i>Echinophyllia aspera</i> var. <i>tosaensis</i> Yabe & Eguchi (1935); Chevalier (1975) <i>Echinophyllia orpheensis</i> Veron (1986); Nishihira & Veron (1995); Veron (2000)

Taxonomic description and diagnosis

Colonies are encrusting, usually < 0.4 m in diameter. The centers are thick and submassive, with thin, laminar margins. Corallites are protuberant, with a diameter of up to 2.4 cm. The corallites become contorted cylinders with increasing growth, and are usually inclined towards the periphery. Septa are in two alternating orders. First order septa are evenly exsert, reaches the columella, with paliform lobes that often form a distinct crown, and have very thick costae. Second order septa are small, and frequently do not form costae. Costae of neighboring corallites are usually adjoined, or end in deep alveoli, with large dentations which are strongly prominent at the corallite rim. Columella is large and compact, except in poorly calcified colonies where the columella is diffuse with little or no development of paliform crown.

Living colonies are usually cream or pale brown, with dark corallite centers that may be green sometimes.

Ecology

Occurs in most reef environments, but are uncommon.

Occurrence

Reef areas in southern and eastern Taiwan, Xiaoliuchiu, Penghu Islands, and Ludao.

Distribution

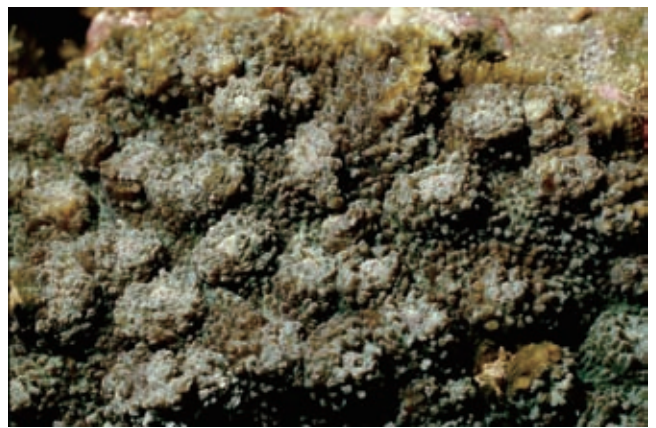
Widely distributed throughout the Indian and west Pacific Ocean, from Mozambique Channel to Vanuatu.

Remarks

This species is similar to *E. aspera*, but the latter is distinguished by its usually thinner appearance, with no paliform crown.



A colony of *Echinophyllia orpheensis*.



A close view showing the protuberant corallites.

Oxypora glabra Nemenzo, 1959

Chinese Name 平滑銳孔珊瑚
Family Lobophylliidae
Publication *Oxypora glabra* Nemenzo (1959)
Synonymy *Oxypora glabra* Veron & Pichon (1980);
Veron (1986); Nishihira & Veron (1995);
Veron (2000)
Echinophyllia glabra Chevalier (1975)



A colony of *Oxypora glabra*.

Taxonomic description and diagnosis

Colonies are encrusting to foliaceous, forming thin, flat to overlapping laminar plates. Corallites are irregularly distributed, with a diameter of 5-8 mm. About 4-8 septa with 1-3 high septal spines usually extend in a clockwise spiral to the corallite center, and most inner margins are fused. Columella is highly reduced or absent. Costae are equal, usually smooth, and perpendicular to colony margin. Deep alveoli occur at the commencement of costae or septo-costae. In the latter case, alveoli occur at the inner margins of all septa that are not fused or do not reach the corallite centers. Slit-like pores between the costae are developed only at the colony margins.

Living colonies are usually yellow brown, with pale septal and costal tops.

Ecology

Commonly found on shallow protected reef slopes.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

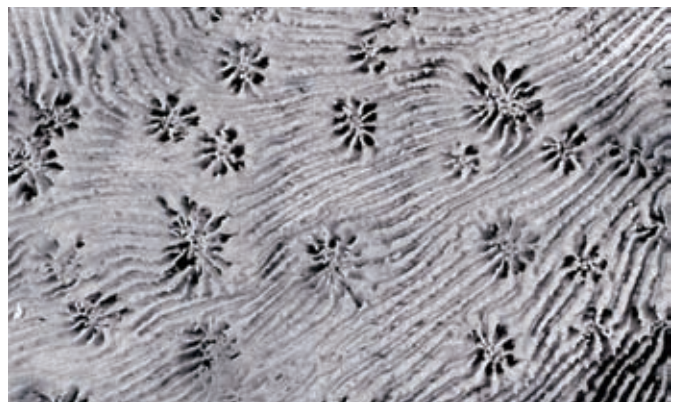
Distributed throughout the west Pacific, from Indonesia to south of Okinawa.

Remarks

This species closely resembles *O. lacera*, but the latter is distinguished by their dentate costae and the presence of columella.



A close view of a colony showing the corallites and septa.



Skeleton of *Oxypora glabra*.

Oxypora lacera (Verrill, 1864)

Chinese Name	網格銳孔珊瑚
Family	Lobophylliidae
Publication	<i>Trachypora lacera</i> Verrill (1864)
Synonymy	<i>Oxypora lacera</i> Yabe & Eguchi (1935); Yabe et al. (1936); Crossland (1952); Wells (1954); Ma (1959); Nemenzo (1959); Chevalier (1975); Veron & Pichon (1980); Veron (1986); Nishihira & Veron (1995); Veron (2000)



An encrusting colony of *Oxypora lacera*.

Taxonomic description and diagnosis

Colonies are encrusting to foliaceous, forming thin, flat to overlapping laminar plates. Corallites are elliptical, roughly arranged in concentric rows. First order septa are fused with the columella, mostly consisting of one high dentation with serrated upper margin. Inner septal margins are usually irregularly dentate and fused with the columella. Columella may be large and spongy, small and fused, or absent. Costae are thick, straight, usually perpendicular to colony margin, and may be arranged in two alternating orders. All costae are dentate. Deep alveoli are present at the commencement of septo-costae, may penetrate to the undersurface of the colony sometimes, but are different from the slit-like pores between the costae of thin plates.

Living colonies are usually pale brown, green or red, may be uniformly colored or with red or green oral discs.

Ecology

Commonly found on shallow protected reef slopes.

Occurrence

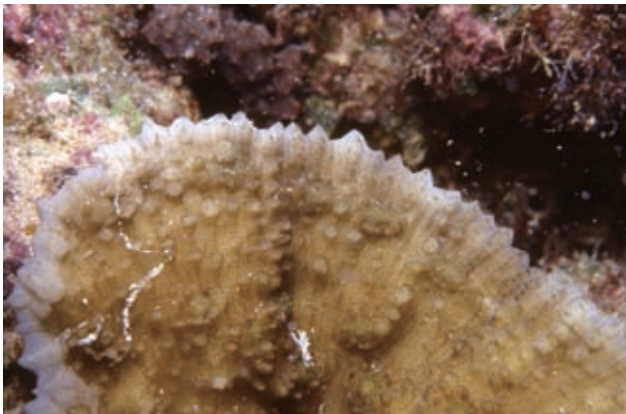
All reef areas around Taiwan and offshore islets.

Distribution

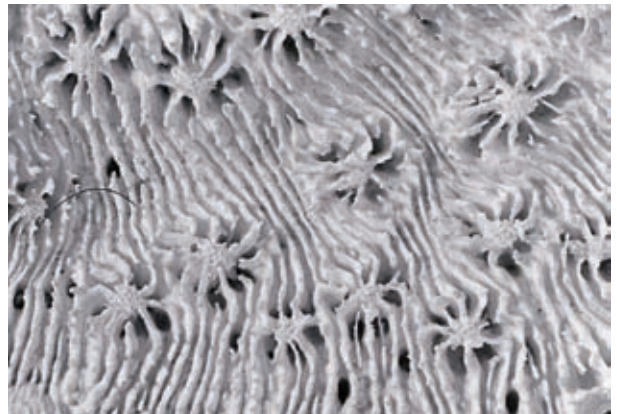
Widely distributed throughout the Indo-Pacific, from the Red Sea and east Africa to Samoa.

Remarks

Colony shapes often vary with environment, with thin and delicate forms in protected environments and more compact in partly exposed environment. This species closely resembles *O. glabra*, but the latter is distinguished by the lack of costal ornamentation and reduction of columella.



A close view of colony edge.



Skeleton of *Oxypora lacera*.

Acanthastrea echinata (Dana, 1846)

Chinese Name 大棘星珊瑚

Family Lobophylliidae

Publication *Astrea echinata* Dana (1846)

Synonymy *Acanthastrea hirsuta* Ma (1959)

Acanthastrea echinata Vaughan (1918);
Yabe & Sugiyama (1935); Yabe et al. (1936);
Eguchi (1938); Crossland (1952); Wells (1954);
Stephenson & Wells (1955); Ma (1959); Chevalier
(1975); Veron & Pichon (1980); Veron (1986),
Nishihira & Veron (1995); Veron (2000)

Favia hemprichii Yabe et al. (1936)

Acanthastrea rotundoflora Chevalier (1975)



Taxonomic description and diagnosis

Colonies are encrusting or massive, may be rounded or flattened. Corallites are cerioid to subplocoid, usually circular, but more angular in turbid biotopes. Calices vary from 11-27 mm in diameter. Septa are regularly spaced, with decreasing thickness and increasingly crowded in shaded colonies. Septal dentations are large and lobate or echinulate, with septal sides being smooth, or very finely granulated. Columella is well developed, may be large and spongy or small and compact. The skeletal structures are usually covered by thick coenosarc, which usually folds into concentric rings joining the septo-costae dentations.

Living colonies are usually uniform dull colored, may also be mottled brown, grey or green; sometimes the oral disc and the coenosarc may be of contrasting colors.

Ecology

Occurs in most reef environments, but usually uncommon.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

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

Remarks

This is the most common *Acanthastrea* species on tropical reefs, but due to its occurrences in a wide range of biotopes, it displays a great range of variation in skeletal characteristics.



A close view of the colony.



Skeletal structure of *Acanthastrea echinata*.

Acanthastrea hemprichii (Ehrenberg, 1834)

Chinese Name	聯合棘星珊瑚
Family	Lobophylliidae
Publication	<i>Astrea hemprichii</i> Ehrenberg (1834)
Synonymy	<i>Acanthastrea hemprichii</i> Nishihira & Veron (1995); Veron (2000)

Taxonomic description and diagnosis

Colonies are massive to encrusting, sometimes with irregular, undulating surfaces and often over 1 m in diameter. Corallites are cerioid, usually with angular outline, sometimes circular. Septa are regularly spaced, with half of the septa being thicker and more exsert. Septal dentations are large, exert and echinulate, regularly distributed on the septa. Septal sides are very finely granulated.

Living colonies are usually mottled brown or green, often with walls being brown and oral discs green. Distinct, fleshy tissue covers the skeleton, but the tissue is not thick enough to obscure the underlying skeletal structures.

Ecology

Occurs in most reef environments, but usually uncommon.

Occurrence

All reef areas around Taiwan.

Distribution

Distributed throughout the west Indian and the west Pacific Ocean.

Remarks

This species is similar to *Acanthastrea echinata*, but the former has more cerioid, packed corallites which are less fleshy. It is also similar to *A. hillae*, but this species is distinguished by their smaller corallites.



A colony of *Acanthastrea hemprichii*.



A close view of the corallites of *Acanthastrea hemprichii*.

Acanthastrea hillae Wells, 1955

Chinese Name 丘形棘星珊瑚
Family Lobophylliidae
Publication *Acanthastrea hillae* Wells (1955)
Synonymy *Acanthastrea hillae* Chevalier (1975);
Veron & Pichon (1980); Veron (1986),
Nishihira & Veron (1995); Veron (2000)



A submassive colony of *Acanthastrea hillae*.

Taxonomic description and diagnosis

Colonies are usually small and submassive, with irregular, undulating surfaces; sometimes they may be up to 1.5 m in diameter. Corallites are cerioid and angular with a diameter of 1.5-4.3 cm, or sub-plocoid and oval, with an average of 2.5 cm in diameter. Most corallites are monocentric; occasionally they may form valleys of up to four centers and reaching 12 cm in length. Septa are not arranged in conspicuous orders, with half of the septa being thicker, more exsert, with larger and coarser dentations. Septal sides are all granulated. Columella is formed by twisted trabeculae derived from irregularly circled, large dentations of primary septa.

Living colonies display a wide range of colors, usually red, brown or cream, with walls and oral discs often of contrasting colors.

Ecology

Most often found in shallow reef environments, and common in high latitudes. Large distinctive, fleshy polyps are only expanded at night.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

Widely distributed throughout the Pacific. Also recorded from east Indian Ocean and the Arabian Sea.



A close view of the corallites with granulated septa.



Skeleton of *Acanthastrea hillae*.

The Faviidae is one of the most important families of reef corals. It is the largest in terms of number of genera and the second in terms of number of species. Faviids are also very abundant in many coral communities and they play an important role in reef ecosystems. Veron et al. (1977) provided a comprehensive review of the taxonomic history of Faviidae, their taxonomic scheme has been followed in most recent coral taxonomy.

However, Fukami et al. (2008) showed that Faviidae is one of the most polyphyletic of all scleractinian families, with members scattered throughout the “robust” clade and the ‘complex’ clade. They suggested that (1) *Oulastrea* and *Leptastrea* are more closely related to Fungiidae; (2) *Plesiastrea* and *Diploastrea* are highly divergent genera and should be excluded from the family; (3) members of the Merulinidae (*Merulina*, *Hydnophora*, *Scapophyllia*, *Boninastrea*) are closely related to the remaining ‘Faviidae’ and should be included in this family; (4) some of the Pectiniidae (*Pectinia*, *Mycedium*) should also be included. They also suggested that the family Faviidae should be abandoned since the type of the family (*Favia fragum*) is in fact a member of Mussidae. However, we suggest to retain the family name and to revise the diagnostic features of this new ‘Faviidae’ based on the fact that the ‘Faviidae’ has been traditionally and widely recognized as an important group of reef corals. *Favia fava* is suggested to be the type species of this new “Faviidae”.

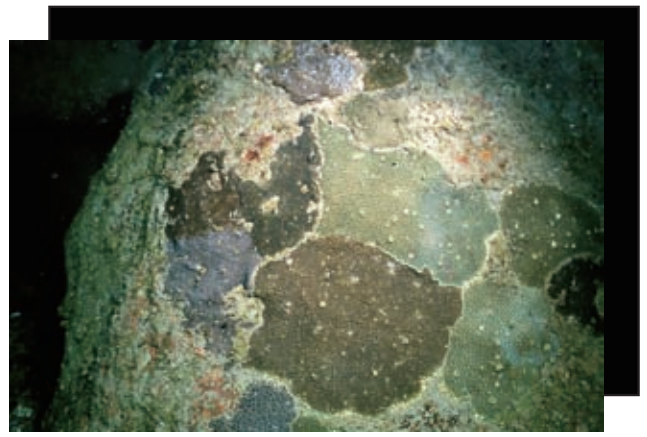
Members of this family have a wide range of corallum growth-forms including phaceloid, plocoid, cerioid, and meandroid. Traditionally, some genera are thought to have a distinct growth-form, for example, phaceloid in *Caulastrea*, plocoid in *Favia*, *Cyphastrea* and *Montastrea*, cerioid in *Favites*, meandroid in *Platygyra* and *Oulophyllia*. However, it is often difficult to define the limit of different genera due to their variability, particularly in the group *Favia*/*Favites*/*Goniastrea*/*Platygyra*. The distinction become more complicated with the inclusion of several genera. Thus, the phylogenetic relationship among genera need more studies.



Faviids often form massive colonies.



Colonies of faviids in intertidal area.



Faviids colonies on rock surface.

Simplified key to genera of Faviidae

Colonies foliaceous

- With radiating valleys, perpendicular to colony margins.....*Merulina*
- With vertical collines extending into high laminae.....*Pectinia*
- Adjacent corallites linked by granulated/echinulated septo-costae.....*Echinopora*
- Corallites nose-shaped.....*Mycedium*

Colonies phaceloid.....*Caulastrea*

Colonies branching.....*Hynophora*

Colonies columnar, valleys 1.5-3 mm in width, and septa of two orders.....*Scapophyllia*

Colonies massive

Corallites plocoid

- Corallites less than 3 mm in diameter.....*Cyphastrea*
- Corallites more than 3 mm in diameter
 - Budding is intratentacular.....*Favia*
 - Budding is extratentacular.....*Montastrea*
- Corallites highly exsert, becoming columnar, 6-15 mm in diameter.....*Barabattoia*

Corallites cerioid

- Paliform lobes conspicuous.....*Goniastrea*
- Paliform lobes inconspicuous.....*Favites*
- Corallites fleshy, large and irregular.....*Oulophyllia*

Corallites meandroid

- Valleys long, sinous, of constant width, and septa of regular size.....*Leptoria*
- Valleys 3-5 mm in width.....*Platygyra*
- Valleys 9-20 mm in width.....*Oulophyllia*

Hydnophores present.....*Hydnophora*

Caulastrea echinulata (Edwards & Haime, 1849)

Chinese Name 粗糙幹星珊瑚

Family Faviidae

Publication *Dasphyllia echinulata* Edwards & Haime (1849)

Synonymy *Dasphyllia echinulata* Edwards & Haime (1849)

Caulastrea echinulata Edwards & Haime (1849); Nemenzo (1959); Veron et al. (1977); Veron (1986); Nishihira and Veron (1995); Veron (2000)

Caulastrea aiharai Yabe & Sugiyama (1935); Yabe et al. (1936);

Taxonomic Description & Diagnosis

Colonies are phaceloid, with parallel branches approximately 6-8 mm apart. Corallites are mostly monocentric, except those in the process of division are dicentric. Monocentric corallites are generally oval, but some appear triangular since their sides may be laterally compressed and flattened. Corallites are 10-12 mm in diameter. Septa range 24-36 in number, and up to 18 may reach the columella. Septa are slightly exsert, up to 2 mm, their margin being irregularly lobed, covered with minute, acute dentations, with scattered conical spines on their sides. Costae are uneven and irregular, covered by small irregular spines. Columella is trabecular.

Living colonies are tan to dark brown, usually with pale oral discs.

Occurrence

Reef areas in southern and eastern Taiwan.

Distribution

Widely distributed throughout East Indian Ocean and the Pacific, from the Indonesian Archipelago to Papua New Guinea.

Remarks

This species may be distinguished from *C. furcata* by their compact mode of branching.



A small colony of *Caulastrea echinulata*.



A close view of corallites, with and without fleshy tissue.

Caulastrea furcata Dana, 1846

Chinese Name 叉枝幹星珊瑚
Family Faviidae
Publication *Caulastrea furcata* Dana (1846)
Synonymy *Caulastrea furcata* Dana (1846);
Yabe & Sugiyama (1932, 1935); Eguchi
(1935); Yabe et al. (1936); Crossland
(1952); Nemenzo (1959); Veron (1986);
Veron (2000)



A living colony of *Caulastrea furcata*.

Taxonomic Description & Diagnosis

Colonies are phaceloid, with branches generally diverging, which may be 10-15 mm apart at their extremities. Continuous variations in the angle of branching, in branch lengths before division, and in the distance between branches can be seen in a typically phaceloid colony. Most corallites are monocentric, circular or oval in outline, with an average diameter of 9.5 mm. Corallites may be shallow, almost superficial, to about 6 mm deep. The walls of corallites are thin, first order septa very exsert (up to 2-3 mm for the principal ones). Septal margins are irregularly dentate. The costae are strongly developed, particularly in the upper edge zone. The columella is generally well developed, and is composed of twisted trabeculae.

Living colonies are brown with bright green centers.

Ecology

Found intertidally or just subtidally on reef edge.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

Widely distributed throughout Indo-Pacific. From Madagascar and the Maldives to Fiji and Tonga.



A close view of the phaceloid colony.



Skeleton of *Caulastrea furcata*, showing the costae.

Caulastrea tumida Matthai, 1928

Chinese Name	短枝幹星珊瑚
Family	Faviidae
Publication	<i>Caulastrea tumida</i> Matthai (1928)
Synonymy	<i>Caulastrea tumida</i> Matthai (1928); Yabe & Sugiyama (1935); Yabe et al. (1936). <i>Caulastrea yokoyamai</i> Yabe & Sugiyama (1931) <i>Caulastrea multiseptata</i> Yabe & Sugiyama (1931) <i>Caulastrea tumida multiseptata</i> Yabe & Sugiyama (1935); Yabe et al. (1936) <i>Caulastrea tumida conglobata</i> Yabe & Sugiyama (1935); Yabe et al. (1936)



A colony of *Caulastrea tumida*.

Taxonomic Description & Diagnosis

Colonies are phaceloid, with comparatively short, thick branches. Corallites are circular, with a diameter of 10-12 mm, when they are young and small; but gradually become oval, even triangular, with dimensions averaging 10-12 x 15 mm, as they become fully developed. Corallite walls are 1.5-2.0 mm thick. Number of septa range from 32 to 60, with an average of 42, in a single corallite. Septa are slightly exsert, up to 2 mm for the principal ones, and are thickened near the wall. Septa are conspicuously dentate, particularly the lower half of their inner margins. Costae are smooth with fine dentations. Columella is trabecular and well developed.

Living colonies are brown, with a green oral disc.

Ecology

Usually found in shallow reefs, also rocky foreshores of subtropical locations.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

Widely distributed throughout East Indian Ocean and the Pacific.



Corallites with extending tentacles of *Caulastrea tumida*.



Corallites of *Caulastrea tumida*.

Favia favaus (Forskål, 1775)

Chinese Name	正菊珊瑚
Family	Faviidae
Publication	<i>Madrepora favaus</i> (<i>pars</i>) Forskål (1775)
Synonymy	<i>Madrepora cavernosa</i> Forskål (1775) <i>Favia affinis</i> Chevalier (1968) <i>Favia ehrenbergi</i> Yabe et al. (1936); Eguchi (1938) <i>Favia favaus</i> (Forskål); Crossland (1952); Wells (1954); Nemenzo (1959); Ma (1959); Chevalier (1971); Scheer & Pillai (1974)



A massive colony of *Favia favaus*.

Taxonomic Description & Diagnosis

Colonies are massive, rounded, sometimes flattened. Corallites are plocoid, and may be up to 5 mm exsert with broad bases, with calices 12-20 mm in diameter. Conical corallites are usually circular, though some may be irregular in shape due to the rapid growth of the colonies. Skeletal structures are very variable both within and between biotopes and to a much lesser extent, within individual coralla. Septa usually have granulation on their sides, and usually do not form distinct orders. They always have elongated, irregular, inwardly sloping dentations, which are finely serrated. The formation of paliform lobes is extremely variable among different colonies; they may be hardly recognizable in some, or form a single, distinct crown in others. Columella is small and trabecular. Costae are equal, always having regular rows of fine dentations; those of adjacent corallites are frequently aligned.

Living colonies are usually dull browns, grey and greens. Sometimes the oral disc is more brightly colored than the coenosarcs. Some colonies are mottled brown and light grey. Individual colonies are usually relatively uniform in color and most colonies within the one biotope have similar colors.

Ecology

Common in many reef environments, may become dominant in back reefs.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

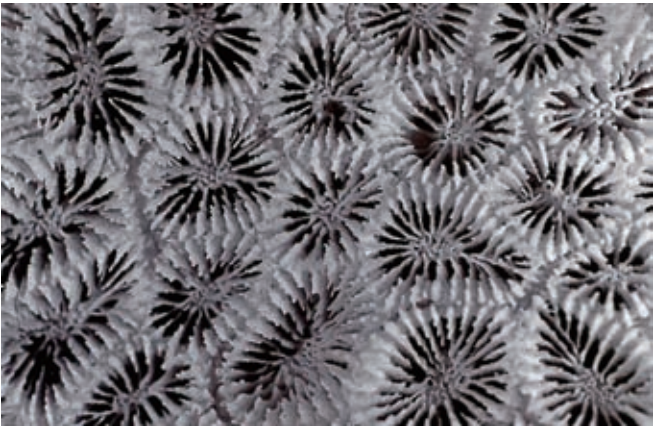
Widely distributed throughout the Indo-Pacific, from the Red Sea to Marshall Islands and Samoa.

Remarks

This is one of the most abundant of the *Favia* species and also one of the most variable, thus it is readily confused with less abundant species in large collections. The great abundance of this species in a wide variety of biotopes greatly facilitates study of intra-biotope growth form variation.



A close view of corallites of *Favia fava*.



Skeleton of *Favia fava*.



A large colony of *Favia fava* in turbid environment.



A colony of *Favia fava* with extending polyps at night.

Favia laxa (Klunzinger, 1879)

Chinese Name 疏菊珊瑚

Family Faviidae

Publication *Orbicella laxa* Klunzinger (1879)

Synonymy *Favia laxa* (Klunzinger); Nemenzo (1959); Veron et al. (1977); Veron (1986); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are massive, flattened or rounded. Corallites are plocoid, with calices 3-6 mm in diameter when matured. Septa are in two distinct orders. First order septa are relatively thick, regularly exsert and dentate above the theca, with well developed paliform lobes which form a conspicuous crown around the columella. Second order septa are thinner, shorter, and descend abruptly down the endotheca without reaching the columella. There are conspicuous dentations along the margins of the septa and paliform lobes, and their sides are granulated. Costae are usually equal, elongated, conspicuous, and finely dentate.

Colonies are uniform in color, usually pale brown or pinkish-brown. Colonies from shaded environments are darker and many colonies have darker sides than tops.

Ecology

Usually occurs in shallow reef environment. Budding is mostly intratentacular.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

Widely distributed throughout the Indo-Pacific, from the Red Sea to New Caledonia and the Great Barrier Reef.



A flattened colony of *Favia laxa*.



Corallites of *Favia laxa*.

Favia lizardensis

Veron, Pichon and Wijsman-Best, 1977

Chinese Name 蜥島菊珊瑚

Family Faviidae

Publication *Favia lizardensis* Veron, Pichon and Wijsman-Best (1977)

Synonymy *Favia lizardensis* Veron (1986); Nishihira and Veron (1995); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are massive, usually spherical. Corallites are plocoid, circular or oval, very regularly spaced, with a diameter of 10-13 mm. Septa are thin, only thickened above the thecae, evenly exsert, with no clear order in septal arrangement. Fine, elongated dentations cover the whole length of the septa, and their sides are finely granulated. Those septa that reach the columella usually have weakly developed paliform lobes. Costae are even and conspicuous. Columella is compact and usually small.

Living colonies are pale pink or brown, with cream or pale greenish oral discs. This color pattern is uniform over the colony, thus this species usually can be easily recognized underwater.

Ecology

Usually occurs in upper reef slopes. Budding is intratentacular, mono- to tristomadaeal.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

Widely distributed throughout the Indo-Pacific, from Bay of Bengal to Marshall Islands and Tonga.

Remarks

F. lizardensis resembles *F. fавus*, but the former may be distinguished by its more regular, shallower corallites, with thinner septa and thecae. This species also resembles *F. pallida* from protected biotopes, but the former has larger corallites and more exsert septa with more elongated dentations.



A massive colony of *Favia lizardensis*.



A close view of corallites showing intratentacular budding.

Favia matthaii Vaughan, 1918

Chinese Name 馬賽菊珊瑚

Family Faviidae

Publication *Favia matthaii* Vaughan, 1918

Synonymy *Favia matthaii* Umbgrove (1940); Wijsman-Best (1972); Veron et al. (1977); Nishihira and Veron (1995); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are massive, rounded, flat or encrusting. Corallites are circular and plocoid, with a diameter of 9-15 mm. Those of colonies from turbid biotopes are wider and shallower. Septa are in three arbitrarily defined orders, with elongated inwardly projecting dentations, which are usually arranged in one or more concentric circles. Septal sides are granulated, margins are finely serrated. Paliform lobes with prominently serrated margins are only developed on first order septa, usually forming a distinctive paliform crown around the columella. Second order septa do not reach the columella. Costae are equal and prominently beaded. Beads of adjacent costae forms concentric circles which are clearly distinguishable in living colonies when polyps are contracted. Columella is compact.

Living colonies mostly in uniform brown, grey or mottled, sometimes with walls and oral discs contrasting in color.

Ecology

Usually occurs in upper reef slopes. Budding is mainly intratentacular.

Occurrence

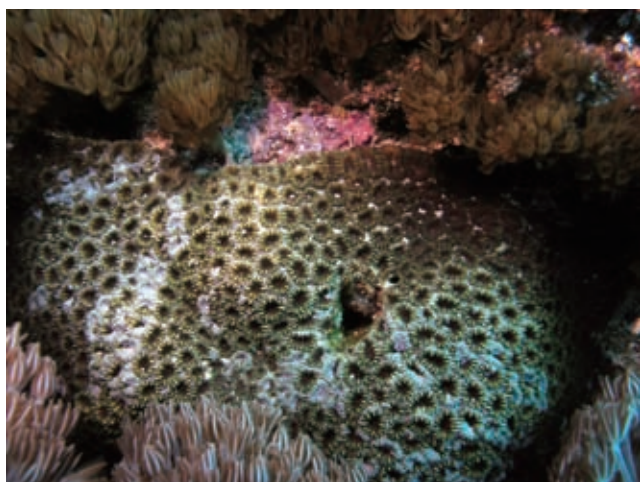
All reef areas around Taiwan and offshore islets.

Distribution

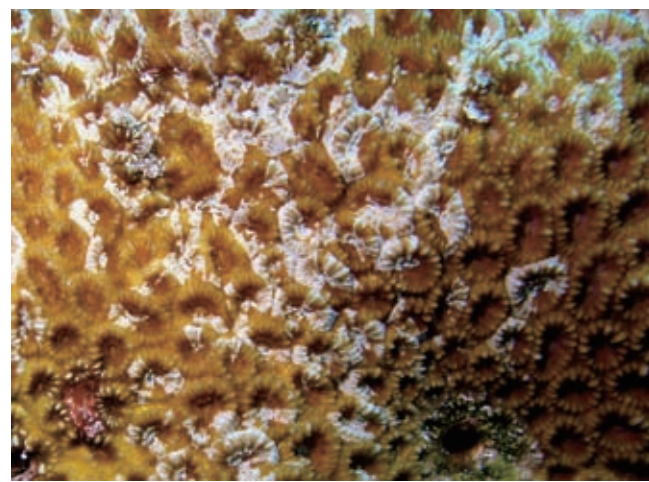
Widely distributed throughout the Indo-Pacific, from the Red Sea and East Africa to Easter Island.

Remarks

This species is close to *F. pallida*, but the two are readily distinguished by the shallower, more open calices, more exsert septa, and a more prominent paliform crown or series of crowns in this species.



A colony of *Favia matthaii*.



A close view of corallites of *Favia matthaii*.

Favia maritima (Nemanzo, 1971)

Chinese Name	海洋菊珊瑚
Family	Faviidae
Publication	<i>Bikiniastrea maritima</i> Nemanzo (1971)
Synonymy	<i>Bikiniastrea maritima</i> Nemanzo (1971) <i>Favia maritima</i> (Nemanzo); Veron (1986); Veron (2000)



A massive colony of *Favia maritima*.

Taxonomic Description & Diagnosis

Colonies are massive, usually hemispherical. Corallites are plocoid, very exsert, with a diameter of up to 20 mm. Septa are uniform, fine and numerous, with regular, relatively fine dentations. Paliform lobes may be poorly developed and inconspicuous or absent. Thecae are very exsert.

Living colonies are dark brown or greenish, sometimes with pale oral disc.

Ecology

Usually occurs on reef slopes. Budding is equal, usually mono- to tri-stomodaeal.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

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

Remarks

This species resembles *Favia maxima* and *F. favaus*, but the three species can be readily distinguished by the differences in corallites size.



Corallites of *Favia maritima*.



Corallites with tentacles extending at night.

Favia maxima

Veron, Pichon & Wijsman-Best, 1977

Chinese Name 大菊珊瑚

Family Faviidae

Publication *Favia maxima* Veron, Pichon & Wijsman-Best, 1977

Synonymy *Favia maxima* Nishihira and Veron (1995); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are massive, which may be nearly spherical or flattened. Corallites are plocoid and very large, with calices of 20-30 mm in diameter, thus the circular or oval shape is usually distorted. They may be compressed closely together or separated widely by gaps of up to 9 mm. Septa are very regular, thickened at the wall, and evenly exsert. Septa are not arranged in orders, and those reaching the columella are usually thicker than the rest. Costae are conspicuous and equal; those of adjacent corallites are usually adjoined. All septo-costae are regularly dentate and conspicuously granulated. Large paliform lobes are present, forming a conspicuous crown around the columella. Polyps are large with elongated tentacles.

Living colonies are not brightly colored, usually dull brown or yellow-brown, with dull green oral discs.

Ecology

Budding is entirely intratentacular, in the manner characteristic of *Favia*. This species is usually found in protected reef environments and on upper slopes.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

Widely distributed throughout the Indo-Pacific, from the Red Sea and Maldives to Micronesia.

Remarks

This is a distinctive species which does not closely resemble any other *Favia*. Calice structures vary greatly in the degree of separation of the calices and the degree to which the structures are calcified. Most colonies observed have skeletal structures as described, but calicular structures of those in shaded environments tend to be finer.



A colony of *Favia maxima*.



Corallites of *Favia maxima*.

Favia pallida (Dana 1846)

Chinese Name 圓紋菊珊瑚

Family Faviidae

Publication *Astraea (Fissicella) pallida* Dana, 1846

Synonymy *Favia amplior* (Edwards & Haime); Yabe & Sugiyama (1935).

Favia okeni Edwards & Haime (1857); Yabe & Sugiyama (1935)

Favia pallida (Dana); Vaughan (1918); Yabe & Sugiyama (1935); Yabe et al. (1936); Eguchi (1938); Wells (1954); Nemenzo (1959); Chevalier (1968, 1971); Utinomi (1971); Scheer & Pillai (1974).

Taxonomic Description & Diagnosis

Colonies are massive, corallites plocoid or plococerioid. Corallites at the sides of large colonies and on colonies from protected or turbid waters are circular and scattered, with thin skeletal structure. Corallites of coralla from exposed biotopes are irregularly squashed together and moderately exsert. Calices averaging 6-10 mm in diameter and are seldom more than 2 mm exsert. Septa are widely spaced and irregular, may appear to be in one, two or three orders. First order septa are usually more exsert; second and third order septa, when present, are slightly thinner than those of the first order. All septa are regularly dentate, the dentations always relatively short. Paliform lobes may form a well defined crown, or may be inconspicuous or absent. Costae are usually equal when present, and are regularly dentate or beaded.

They may be almost any color underwater. Usually the coenosarcs is pale yellow, cream or green, the oral disc dark-brown or green.

Ecology

Occurs in all reef environments, especially reef flat or reef front where the current is strong.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

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

Remarks

It is one of the most common faviid, illustrating a wide range of intra-biotope variation, and often a dominant of back reef margins. Intra-biotope variation is minimal in exposed localities such as outer reef fronts, and increases with increasing water turbidity and protection from wave action.



A massive colony of *Favia pallida*.



Corallites of *Favia pallida*.

Favia rotumana (Gardiner, 1899)

Chinese Name	羅氏菊珊瑚
Family	Faviidae
Publication	<i>Astraea rotumana</i> Gardiner, 1899
Synonymy	<i>Favia rotumana</i> (Gardiner); Yabe & Sugiyama (1935); Yabe et al. (1936); Wells (1954); Nemenzo (1959); Ma (1959); Chevalier (1971); Scheer & Pillai (1974)



A colony of *Favia rotumana* in turbid environment.

Taxonomic Description & Diagnosis

Colonies are massive and rounded. Corallites are cerioid to sub-plocoid, usually monocentric, but may form short irregular valleys of up to three centers. Shapes of corallites are typically irregular. Septa are thin, irregularly exsert, and descend steeply inside the thecae, which form inconspicuous paliform lobes when reaching the columella. Septa appear ragged due to prominent dentations of irregular length, particularly on the inner margins of the paliform lobes. Those of adjacent corallites are not usually adjoined. The sides of the septa and the endotheca are granulated. Columella is compact.

Living colonies are in a wide range of colors, corallite walls and oral discs are usually of contrasting colors.

Ecology

Occurs in a wide range of coral reef habitats, especially on shallow parts of reef slopes.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

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

Remarks

This species displays a wide variation of calicular structure reflecting the high diversity of environments it occupies. Colonies from shallow, clear waters are clearly plocoid, and show thickening of all skeletal structures. Corallites of those from protected biotopes become cerioid, irregularly shaped, with very exsert septa that have long, irregular dentations.



Corallites of *Favia rotumana*.



A colony of *Favia rotumana* in protected habitat.

Favia rotundata (Veron, Pichon & Wijman-Best 1977)

Chinese Name 圓形菊珊瑚

Family Faviidae

Publication *Favites rotundata* Veron, Pichon & Wijman-Best (1977)

Synonymy *Favia rotundata* Sheppard and Sheppard (1991), Nishihira and Veron (1995); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are massive, dome-shaped or flat. Corallites are circular, with thick walls, tending to be subplocoid or plococerioid, with calices averaging 17-20 mm in diameter. Polyps are circular in outline and fleshy, sometimes covering the underlying skeletal structure, thus corallites seem like cerioid.

Colonies are usually pale grey, yellowish or brown, with the margin of the corallites showing slightly contrasting colors.

Ecology

They are usually found on reef slopes and lagoons.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

Widely distributed throughout the Indo-Pacific, from Bay of Bengal to Marshall Islands and Fiji.

Remarks

This species is similar to *Favia maxima* and *Favia veroni*, whose corallites are of similar sizes, but the latter are usually more exsert, both being plocoid.



A colony of *Favia rotundata*.



Corallites of *Favia rotundata*.

Favia speciosa (Dana 1846)

Chinese Name 環菊珊瑚

Family Faviidae

Publication *Astraea speciosa* Dana, 1846

Synonymy *Favia speciosa* Wijsman-Best (1972), Veron (1986), Sheppard and Sheppard (1991), Nishihira and Veron (1995), Veron (2000)

Taxonomic Description & Diagnosis

Colonies are massive or spherical, also encrusting sometimes. Corallites are subcircular, plocoid or plococeroid, crowded and unequal; closely compacted in shallow waters, more widely spaced in deeper waters. Calices are up to 12 mm in diameter. Septa are thinner, more numerous and more regular, with longer dentations than those in *F. pallida*. Paliform lobes are also better developed.

Living colonies may be pale grey, green or brown, usually with calices of contrasting color.

Ecology

This species occurs widely throughout the Indo-Pacific in all types of coral reef habitats, especially on reef flats and reef margins where current is stronger.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

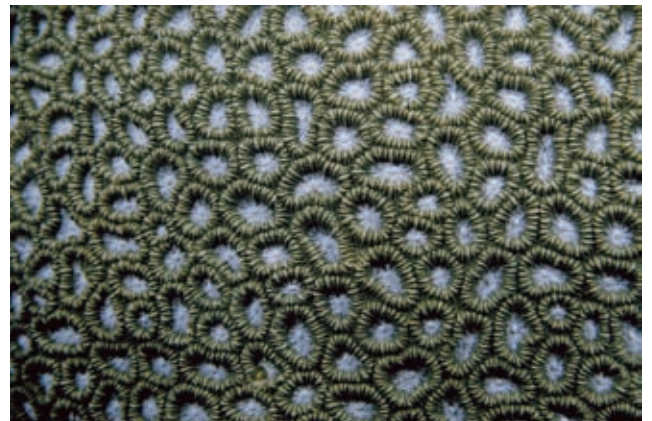
Widely distributed throughout the Indo-Pacific, from the Red Sea to Society Islands.

Remarks

It is easily confused with *Favia pallida*, but the latter has less septa which are irregularly arranged.



A massive colony of *Favia speciosa*.



Corallites of *Favia speciosa*.

Favia stelligera (Dana, 1846)

Chinese Name 小菊珊瑚

Family Faviidae

Publication *Orbicella stelligera* Dana (1846)

Synonymy *Orbicella orion* Dana (1846)

Favia hombroni Chevalier (1968).

Favia stelligera (Dana); Vaughan (1918); Crossland (1952); Yabe & Sugiyama (1935); Yabe et al. (1936); Eguchi (1938); Wells (1954, 1955); Ma (1959); Chevalier (1968, 1971); Scheer & Pillai (1974).

Taxonomic Description & Diagnosis

Colonies are massive or sub-massive, may be spherical, columnar, hillocky or flat. Corallites are plocoid, skeletons usually hard, dense and brittle. The major difference between colonies from exposed biotopes and those from partly protected biotopes is that the former possess larger calices, 2.5-3.5 mm in diameter, and more heavily calcified calicular structures. Septa are usually moderately exsert; they have dentations and granulation on their sides. Septa are in two orders, sometimes indistinct; a third order of very small septa may occur in large calices. First order septa are irregular in length; those reaching the columella usually have large paliform lobes, which are irregular in length and number. Columella are trabecular and inconspicuous. The theca is thick except for very actively dividing calices. The coenosteum is smooth and frequently blistered.

Living colonies are brown or green.

Ecology

Usually occurs in reef front where the current is strong, it may also be found in more protected waters.

Occurrence

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

Distribution

Widely distributed from the Red Sea to Hawaii and the Great Barrier Reef.



A columnar colony of *Favia stelligera*.



A close view of corallites of *Favia stelligera*.

Favia veroni Moll & Borel-Best, 1984

Chinese Name 圓突菊珊瑚

Family Faviidae

Publication *Favia veroni* Moll and Borel-Best (1984)

Synonymy *Favites veronia* Nishihira & Veron (1995); Veon (2000)

Taxonomic Description & Diagnosis

Colonies are massive, with corallites of irregular shapes. Corallites are often compacted together and irregularly projecting. Calices are very large, up to 25 mm in diameter and 10 mm deep. Paliform lobes are absent.

The colors of living colonies are very variable, corallites are usually rich brown or red with cream oral discs.

Ecology

Usually occurs on upper reef slopes.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

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

Remarks

This species has corallites of similar sizes to those of *Favia maxima*, but the latter has conspicuous paliform lobes. Another similar species is *Favia maritima*, whose corallites are more widely spaced, smaller, and prominent.



A colony of *Favia veroni*.



Corallites of *Favia veroni* with intratentacular budding.

Favia vietnamensis Veron, 2000

Chinese Name 珊瑚

Family Faviidae

Publication *Favia vietnamensis* Veron (2000)

Taxonomic Description & Diagnosis

Colonies may be encrusting or massive. Corallites are irregular in outlines, with exsert walls and deep calices. Corallites may be up to 15 mm in maximum dimension. Septa are in two alternating orders and irregular in height, with strong dentations which increase in length towards the columella. Half to all of the primary septa may reach the columella, with some fusion at the inner septal margins. Paliform lobes are weakly developed. Columella is compact and 3-6 mm in diameter. Costae of neighboring corallites are usually adjoined.

Living colonies are fleshy, usually brown or grey, with oral discs of either uniform or distinctive color.

Ecology

Found only in protected reef environments and is rare. Budding is intratentacular.

Occurrence

Only found in Dongsha Atoll.

Distribution

Distributed throughout the central Pacific, from Japan to the Great Barrier Reef.

Remarks

This species is easily distinguished from other species of *Favia* by its large, irregular and fleshy corallites. However, it may resemble the subphaceloid colonies of *Caulastrea tumida* in appearance.



A massive colony of *Favia vietnamensis*.



A close view of the corallites.

Barabattoia amicornum (Edwards & Haime, 1850)

Chinese Name	和平芭蘿珊瑚
Family	Faviidae
Publication	<i>Parastrea amicornum</i> Edwards and Haime (1850)
Synonymy	<i>Favia amiorum</i> Wijsman-Best (1972); Veron et al. (1977) <i>Barabattoia amiorum</i> Veron (1986); Nishihira and Veron (1995); Veron (2000)



A colony of *Barabattoia amicornum*.

Taxonomic Description & Diagnosis

Colonies are massive or encrusting and usually small. Corallites are plocoid to tubular with irregular spacing, the latter growth form are usually found on colonies in turbid water, largely due to deposition of sediment within and around colonies, allowing only exsert corallites and protruding parts of colonies to grow. The corallites are very protuberant compared to those of species of *Favia*. Septa are in two indistinct, alternating orders, with strongly dentate inner margins. Costae are prominent, evenly distributed and well developed. Paliform lobes are usually poorly developed. Columella is small and compact. Budding is primarily extratentacular. Polyps are extended only at night.

Living colonies are usually mottled brown and green or brown and cream.

Ecology

Normally occurring in shallow and turbid reef environment.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

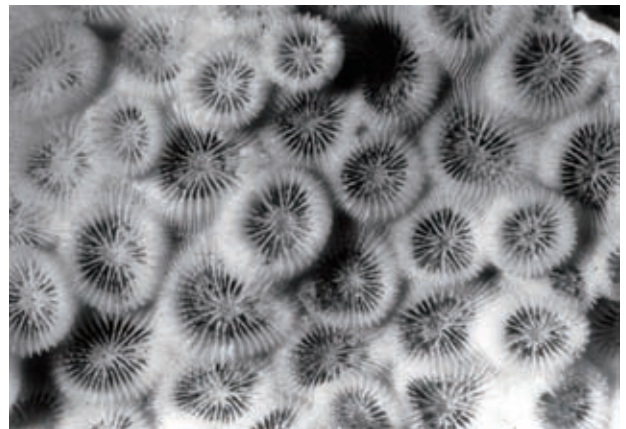
Though uncommon, it is widely distributed throughout the Indo-Pacific, from Bay of Bengal to French Polynesia.

Remarks

Barabattoia is an ill-defined genus made up of uncommon species which usually have elongate corallites. Sometimes these corallites are so elongate that they anastomose, giving the colonies a “dendroid” structure.



A close view showing irregularly spaced corallites.



Skeleton of *Barabattoia amicornum*.

Favites abdita (Ellis & Solander, 1786)

Chinese Name 隱藏角菊珊瑚

Family Faviidae

Publication *Madrepora abdita* Ellis & Solander (1786)

Synonymy *Favites abdita* (Ellis & Solander); Vaughan (1918); Yabe & Sugiyama (1935); Yabe et al. (1936); Eguchi (1938); Crossland (1952); Wells (1954, 1955); Nemenzo (1959); Ma (1959); Utinomi (1965, 1971); Chevalier (1968, 1971); Wijsman-Best (1972); Veron et al. (1977); Veon (1986); Nishihira & Veron (1995); Veon (2000)

Taxonomic Description & Diagnosis

Colonies are massive, may be rounded, flattened or hilly. Corallites are cerioid, usually rounded rather than angular, with mature calices of 7-12 mm in diameter. Colonies growing in marginal conditions, such as deep, turbid or temperate waters, may be very thin with small, shallow, and widely spaced calices whose skeletal structures are very reduced. More massive colonies usually have much larger and deeper calices with angular outlines. The hilly growth form occurs in clear waters protected from strong wave action. Septa are moderately exsert, regularly spaced, and usually uniform in thickness, with prominent dentations along the septal margins. Paliform lobes are absent or weakly developed, no conspicuous crown is formed. The columella is spongy and compact.

The color of living colonies is variable. They are usually various shades of pale brown, frequently with a bright green oral disc and/or stomodaeum, in well-illuminated areas. In deep or turbid biotopes, they are usually dark.

Ecology

Common in all types of coral reef habitats. Budding is always intratentacular and usually very unequal.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

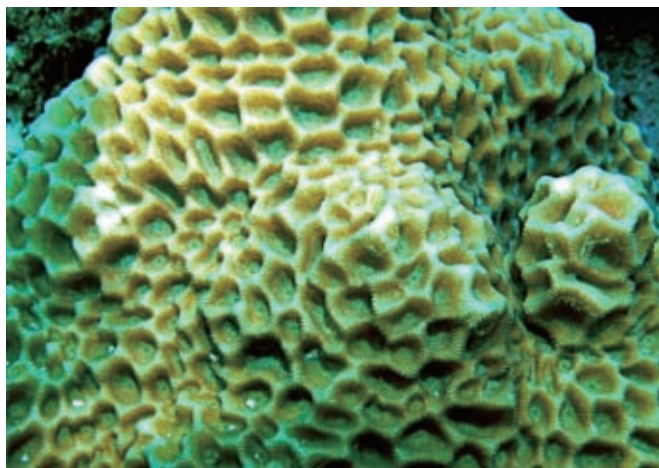
Widely distributed throughout the Indo-Pacific from the Red Sea to Samoa.

Remarks

It is similar to *Favites halicora* and *Favites flexuosa*.



A hilly colony of *Favites abdita*.



A close view of the cerioid corallites.

Favites chinensis (Verrill, 1866)

Chinese Name 中國角菊珊瑚

Family Faviidae

Publication *Prionastraea chinensis* Verrill (1866)

Synonymy *Favites yamanarii* Yabe & Sugiyama (1935); Yabe et al. (1936); Nemenzo (1959)

Favites acuticollis (Ortmann); Chevalier (1971)

Favites chinensis (Verrill); Veron et al. (1977); Nishihira & Veron (1995); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are massive and rounded. Corallites are cerioid to subplocoid and angular or irregular in shape. They are shallow with thin walls, and with a diameter of 10-13 mm when matured. Septa are in two or three indistinct orders, in most calices, septa are straight and equal. They vary in thickness but are usually regularly and widely spaced. Septa have elongated dentations, and the dentations of adjacent septa are frequently aligned in concentric rows on their upper margin. Towards the center of the calice, sizes of dentations are usually reduced. Paliform lobes may be absent or short, rounded and inconspicuous. The columella is compact and deep within the calices. The thecae are thin and angular.

Living colonies are usually yellow or greenish-brown.

Ecology

Found in all types of coral reef environments.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

Widely distributed throughout the Indo-Pacific, from the Red Sea and East Africa, to Japan and New Caledonia.

Remarks

The correlation between skeletal structures and the environment is less clear than the other *Favites*. However, for colonies from protected biotopes, the septa become less exert and less numerous, septal dentations are shorter, and the thecae are thinner.



A colony of *Favites chinensis*.



A close view of the polyps.

Favites complanata (Ehrenberg, 1834)

Chinese Name 板葉角菊珊瑚

Family Faviidae

Publication *Favia complanata* Ehrenberg (1834)

Synonymy *Favites complanata* (Ehrenberg); Yabe et al. (1936); Eguchi (1938); Chevalier (1968, 1971); Veron et al. (1977); Veron (1986); Nishihira & Veron (1995); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are massive, usually with an even surface. Corallites are cerioid or slightly sub-plocoid, slightly angular in shape, with calices 8-12 mm in diameter. Septa are in two alternating cycles, septa of both cycles are finely granulated, and those of the adjacent corallites are usually adjoined. Primary septa are thick, with 4 or 5 regular and very prominent dentations. Distinct paliform lobe is developed on primary septa. Columella is large and compact. Costae are in two unequal cycles, often forming a three pointed star where three corallites adjoin.

Living colonies are usually brown, sometimes with green centers. Septa are in two alternating cycles.

Ecology

Found in most coral reef environments.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

Widely distributed throughout the Indo-Pacific, from the Red Sea to Tahiti and the Tuamotu Archipelago.

Remarks

Colonies from exposed biotopes tend to become sub-plocoid with circular corallites, having very shallow calices. Septa are very thick and septal cycles very unequal. Those from protected biotopes more closely resemble the type described above.



A massive colony of *Favites complanata*.



A close view of the cerioid corallites.

Favites flexuosa (Dana 1846)

Chinese Name 柔角菊珊瑚

Family Faviidae

Publication *Astraea flexuosa* Dana (1846)

Synonymy *Favites flexuosa* Yabe et al. (1936); Veron et al. (1977); Veron (1986); Nishihira & Veron (1995); Veron (2000)

Favites virens Wijsman-Best (1972)

Taxonomic Description & Diagnosis

Colonies are massive or encrusting, usually flattened or spherical, with an even surface, not hillocky. Corallites are usually angular, always completely cerioid, with a diameter of 1.5-2.0 cm. Septa are usually in two alternating orders, those of the first order are exsert, prominent with large conspicuous dentations, and the dentations usually develop into one or more irregular paliform lobes towards the center. Second order septa are usually much thinner, more reduced, and less exsert. Columella is small and compact.

Living colonies display a wide range of colors; usually the corallite walls and the oral discs are in contrasting colors.

Ecology

Occurs in a wide range of coral reef habitats and rocky foreshores, more often found on reef flats of depth 10-15 m. Budding is intratentacular.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

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

Remarks

Colonies from exposed biotopes are heavily calcified, having thick, strongly alternating septa and wide columella. The depth of the calices varies greatly and septa are fine with elongated dentations on those from partly protected reefs. Calices of colonies from turbid water are irregular with relatively exsert septa. Septa are with long, fine, and uneven dentations. The columella tends to become trabecular.



A massive colony of *Favites flexuosa*.



A close view of the angular corallites.

Favites halicora (Ehrenberg, 1834)

Chinese Name 實心角菊珊瑚

Family Faviidae

Publication *Astraea halicora* Ehrenberg (1834)

Synonymy *Favite halicora* Vaughan (1918); Crossland (1952); Wells (1955); Ma (1959); Nemenzo (1959); Chevalier (1971); Scheer & Pillai (1974); Wijsman-Best (1972); Veron et al. (1977); Veron (1986); Nishihira & Veron (1995); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are encrusting or submassive, some are hillocky. Corallites are cerioid, but in exposed biotopes they have a tendency to become sub-plocoid. Calices are approximately 1 cm in diameter. Septa are usually equal, although some corallites have a reduced-sized second and alternating cycle. Septa have fine and regular dentations along the length of the margin, except at the inner margins, the dentations become larger and develop into one or more paliform lobes, possible forming a distinct paliform crown. Columella is compact and spongy. The thecae are characteristically thick.

Living colonies are usually a uniform pale yellowish or greenish-brown.

Ecology

Occurs in all kinds of coral reef environments, most often in shallow waters. Budding is both intra- and extra-tentacular, the former clearly being the dominating budding mode in this species.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

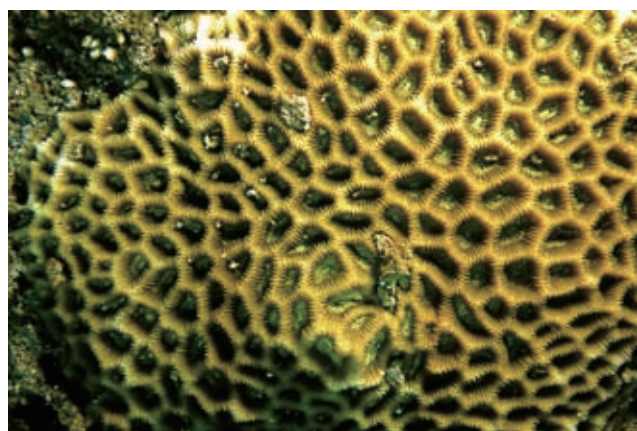
Widely distributed throughout the Indo-Pacific from the Red Sea to Samoa.

Remarks

This species is close to *F. abdita* but is distinguished from it by its more rounded corallites, thicker thecae and the development of the paliform crown. In very protected biotopes, paliform lobes are well developed, resembling those of *Goniastrea*.



A submassive colony of *Favites halicora*.



A close view of the corallites.

Favites pentagona (Esper 1794)

Chinese Name 五邊角菊珊瑚

Family Faviidae

Publication *Madrepora pentagona* Esper (1794)

Synonymy *Favites pentagona* Yabe & Sugiyama (1935); Yabe et al. (1936); Crossland (1948); Ma (1959); Utinomi (1971); Chevalier (1971); Wijsman-Best (1972); Veron et al. (1977); Veron (1986); Nishihira & Veron (1995); Veron (2000)

Favites parvicella Nemenzo (1959)

Favites gailei Chevalier (1971)

Taxonomic Description & Diagnosis

Colonies from exposed biotopes are massive, frequently very dense, with an even surface. The sides of corallites are relatively straight, with 4-6 angles. Colonies from protected biotopes may be encrusting, sub-massive or sub-ramose, and irregular in shape.

Corallites are cerioid, their diameters seldom exceeding 6 mm, despite of the environment they grow in. Usually septa of very variable lengths can be distinguished into two cycles. The septa are variably exsert over the thecae; those of adjacent corallites are frequently adjoined. Well developed paliform lobes, which in turn forms distinctive crown around the columella, is found on those septa reaching the columella. In sub-ramose colonies, the septa have elongated and conspicuous dentations. Columella is loose and poorly developed, except in exposed waters, it becomes relatively well developed and compact.

Living colonies displays a wide range of colors, most often brightly colored, brown or red, commonly with green oral discs. Some colonies may be a mixture of red and brown.

Ecology

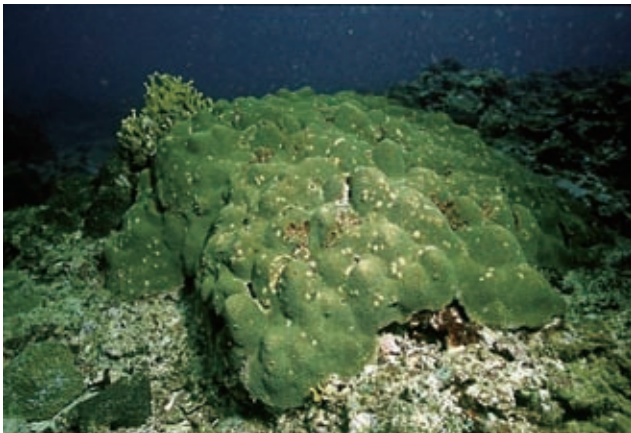
Occurs in all types of coral reef habitats, most often found in shallow areas. Budding is extremely marginal to extratentacular.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

Widely distributed throughout the Indo-Pacific, from the Red Sea and East Africa to New Caledonia and the Great Barrier Reef.



A massive colony of *Favites pentagona*.



A close view of the corallites.

Favites russelli (Wells, 1954)

Chinese Name 羅素角菊珊瑚

Family Faviidae

Publication *Plesiastrea russelli* Wells (1954)

Synonymy *Plesiastrea russelli* Wells (1954)

Favites russelli Wijsman-Best (1976); Veron et al. (1977); Veron (1986); Nishihira & Veron (1995); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are submassive or encrusting, corallites are cerioid or sub-plocoid, usually irregular in shape. Septa are in three indistinct, irregular orders. First order septa are frequently highly exsert, with dense and irregular granulation. They are thicker than others, and become thinner towards the center. The margins of first and second order septa terminate in a prominent, minutely granulated paliform lobe, which is separated from the septa by a deep notch. Higher order septa are frequently adjoined to lower ones. Columella is usually small and compact.

Living colonies are usually deeply colored, very often brown or mottled; sometimes the oral disc may be in different colors.

Ecology

Found in most coral reef environments. Cerioid colonies or parts of those colonies predominantly exhibit intratentacular budding; sub-plocoid forms usually exhibit extratentacular budding.

Occurrence

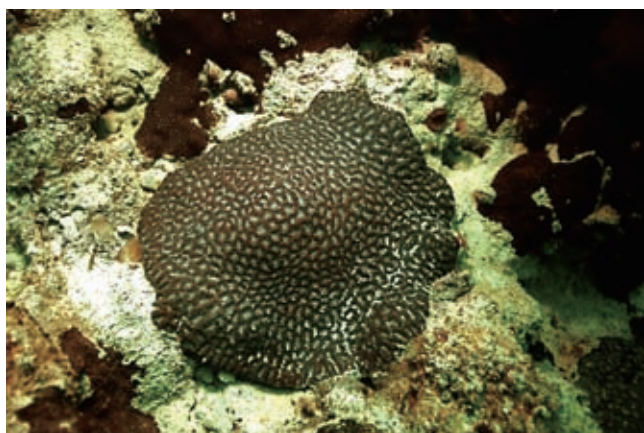
All reef areas around Taiwan and offshore islets.

Distribution

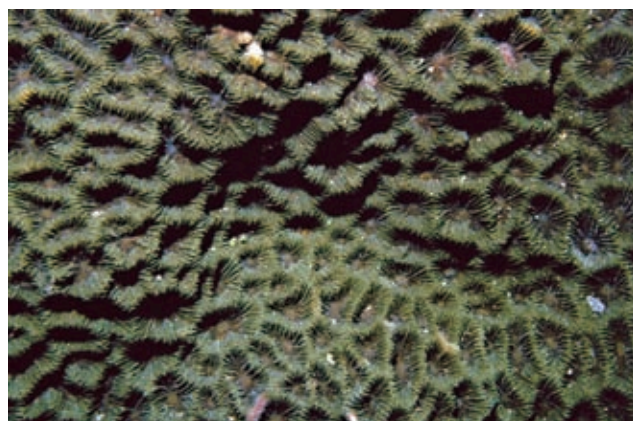
Widely distributed throughout the Indo-Pacific, from the Red Sea to Marshall Islands.

Remarks

Colonies from exposed biotopes tend to be massive and cerioid. Corallites are very irregular in shape, with more than one center sometimes. Both septa and paliform lobes are highly dentate. Those from turbid biotopes show great reduction in calices size and in the degree of calcification of all calicular structures.



A submassive colony of *Favites russelli*.



A close view of the irregular corallites.

Goniastrea aspera Verrill, 1865

Chinese Name 粗糙角星珊瑚

Family Faviidae

Publication *Goniastrea aspera* Verrill (1865)

Synonymy *Goniastrea aspera* Verrill; Yabe & Sugiyama (1935); Yabe et al. (1936); Eguchi (1938); Veron et al. (1977); Veron (1986); Nishihira & Veron (1995); Veron (2000)

Goniastrea mantonae Crossland (1952); Nemenzo (1959)

Taxonomic Description & Diagnosis

Colonies are massive and rounded or encrusting. Corallites are cerioid, deep, with a cellular appearance. The corallite walls are straight sided, with calices 7-10 mm in diameter. Septa may be the same order or in two regularly arranged, alternating orders. Septa are slightly exsert, evenly spaced, and descend abruptly. Paliform lobes of colonies from more protected environment are regularly spaced and very broad, usually forming very conspicuous paliform crowns; those from more exposed habitats have reduced paliform lobes. The margins of both septa and paliform lobes are covered with fine dentations. Thecae are usually thin. Columella is small and compact.

Living colonies are usually uniform pale brown in color, sometimes with cream corallite centers.

Ecology

Found in most coral reef environments. Budding is usually intratentacular.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

Widely distributed throughout the Indo-Pacific, from East Africa to New Caledonia.

Remarks

This species is similar to *G. favulus*, but the former has paliform lobes which are more elongated and rounded.



A massive colony of *Goniastrea aspera*.



A close view of the corallites.

Goniastrea australensis (Edwards & Haime, 1857)

Chinese Name 翼形角星珊瑚

Family Faviidae

Publication *Prionastrea australensis* Edwards & Haime (1857)

Synonymy *Goniastrea benhami* Vaughan, 1917; Crossland (1952); Ma (1959)

Goniastrea australensis (Edwards & Haime); Wijsman-Best (1972); Veron et al. (1977); Veron (1986); Nishihira & Veron (1995); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are massive, submassive or encrusting. Corallites may be very meandroid with long valleys or sub-meandroid with short valleys of 1-3 centers. Valleys are deep, steep sided, with distinct corallite centers in most colonies. Septa are regularly spaced, equal and evenly exsert, with paliform lobes. Septal margins are covered with fine dentations. Septa are adjoined over the thecae with those of adjacent valleys. Columella is large and conspicuous. Great variation may be observed in thecae thickness; colonies with very wide thecae may become sub-plocoid due to separation by a groove.

Colonies show variation in their skeletal structures relating to their environment. Valley lengths vary from being monocentric on concave surfaces to indefinite length on convex ones. Those from partly protected biotopes usually have shorter valleys, with distinct centers and columella. Colonies from deep or turbid waters have indistinguishable centers, with both columella and paliform lobes reduced.

Living colonies are in variable colors, mostly uniform dull brown or green, sometimes with walls and valley floors in contrasting colors.

Ecology

Found in most coral reef environments.

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.

Remarks

This is the only fully meandroid *Goniastrea*. It resembles *Platygyra lamellina* underwater, but the two are distinguished by the lack of paliform lobes in the latter species. In semi-protected biotopes where it tends to be sub-meandroid or monocentric, it resembles *G. pectinata*, but the former have valleys of more regular width and more regularly spaced septa.



A massive colony of *Goniastrea australiensis*.



A close view of the meandroid corallites.

Goniastrea edwardsi Chevalier, 1971

Chinese Name 艾氏角星珊瑚

Family Faviidae

Publication *Goniastrea edwardsi* Chevalier (1971)

Synonymy *Goniastre parvistella* (Dana); Yabe et al. (1936); Nemenzo (1959); Wijsman-Best (1972)
Goniastrea edwardsi Wijsman-Best (1976); Veron et al. (1976); Veron (1986); Nishihira & Veron (1995); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are usually massive or columnar. Corallites are cerioid, angular in outline, with calices 2.5-7.0 mm in diameter when matured. Septa are in three distinct orders, the length of the septa are variable. First order septa are slightly exsert; they descend near vertically inside the thecae, and then form a very large, thickened paliform lobe. Outer margins of first order septa are usually thickened, granulated, and regularly dentate. Second and third order septa are almost indistinguishable. Second order septa are about half the length of those of the first order, and third order septa are even more reduced in length. Both have no paliform lobe and are not exsert. There are no costae. Columella is trabecular or spongy and very granulated. There are no costae.

Ecology

Usually occur in intertidal and shallow subtidal reef environments where the current is slightly stronger.

Occurrence

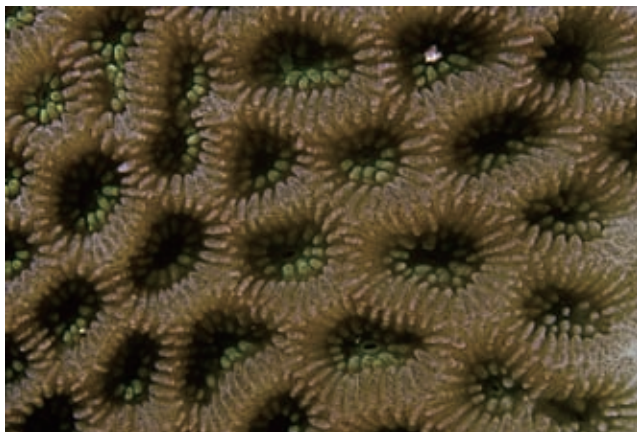
All reef areas around Taiwan and offshore islets.

Distribution

Widely distributed in Indo-Pacific reefs from the Seychelles to the Loyalty Islands.



A massive colony of *Goniastrea edwardsi*.



A close view of the polyps.

Goniastrea favulus (Dana, 1846)

Chinese Name 似菊角星珊瑚

Family Faviidae

Publication *Astraea (Fissicella) favulus* Dana (1846)

Synonymy *Goniastrea favulus* (Dana); Wijsman-Best (1972); Veron et al. (1977); Veron (1986); Nishihira & Veron (1995); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are massive or submassive, rarely encrusting. Corallites are mostly submeandroid, sometimes cerioid, monocentric or polycentric. Septa are arranged in two orders, all are granulated. First order septa are slightly exsert, with large, prominent paliform lobes forming a conspicuous paliform crown around the columella. Septal margins and the inner margins of the paliform lobes are covered with fine dentations. Second order septa are short and not exsert. Columella is compact and spongy, and become continuous, which links conspicuous centers in polycentric valleys. Thecae are thin, except for colonies from exposed habitats.

Living colonies are usually dull green and brown.

Ecology

Occurs in a wide range of habitats.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

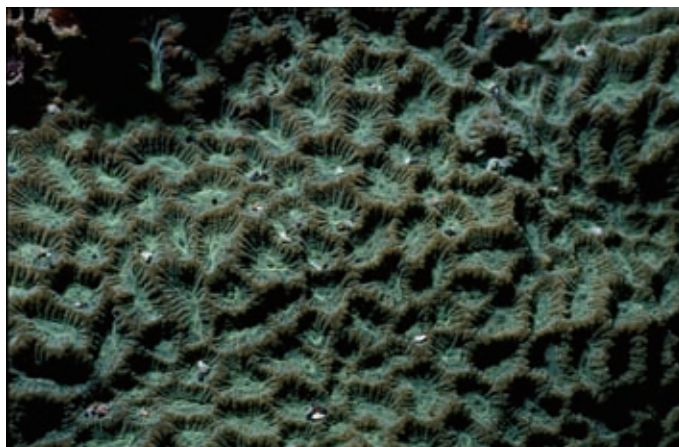
Widely distributed throughout the Indo-Pacific, from the Maldives to Samoa.

Remarks

This species is similar to *G. australiensis*, but the latter has paliform lobes which are more elongated and rounded.



A colony of *Goniastrea favulus*.



A close view of the submeandroid corallites.

Goniastrea pectinata (Ehrenberg 1834)

Chinese Name 翼形角星珊瑚

Family Faviidae

Publication *Astraea pectinata* Ehrenberg (1834)

Synonymy *Goniastrea planulata* Vaughan (1918);

Yabe & Sugiyama (1935); Yabe et al. (1936);

Eguchi (1938); Nemenzo (1959); Ma (1959)

Goniastrea pectinata (Ehrenberg);

Vaughan (1918); Yabe & Sugiyama

(1935); Yabe et al. (1936); Eguchi (1938);

Crossland (1952); Nemenzo (1959); Ma

(1959); Utinomi (1965); Chevalier (1968,

1971); Scheer & Pillai (1974); Veron et al.

(1977); Veron (1986); Nishihira & Veron

(1995); Veron (2000)



A colony of *Goniastrea pectinata*.

Taxonomic Description & Diagnosis

Colonies are mostly submassive or encrusting. Corallites are cerioid to submeandroid, monocentric to less than three centers. Septa are in two distinguishable orders in most colonies, though in some, the second order septa may be extremely reduced or absent, or it may be confused with those of the first order. First order septa slightly exsert, with fine dentations along their upper margins and fine granulations on their sides. They have well developed paliform lobes or series of paliform lobes in the form of large dentations. A conspicuous paliform crown is formed around the columella in colonies from exposed biotopes. The thecae are of variable thickness.

Living colonies are usually in uniform pale brown, but may be darker in deep or turbid waters where light availability is reduced. Colonies exposed to strong sunlight may be pale violet or pink.

Ecology

Found in most coral reef environments, especially in shallow waters.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

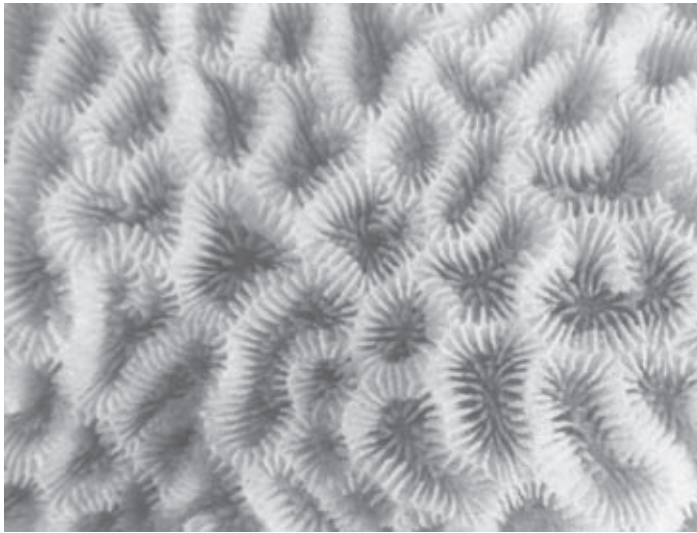
Widely distributed throughout the Indo-Pacific, from the Red Sea to Samoa.

Remarks

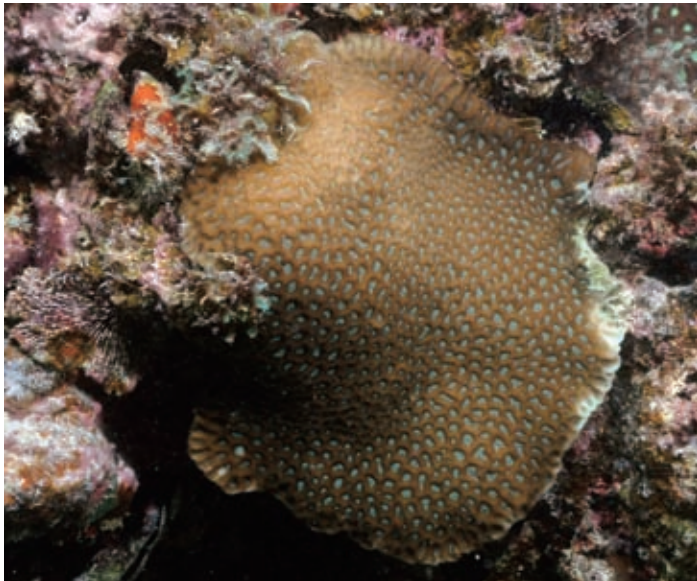
Colonies from exposed biotopes may resemble *G. edwardsi* and *G. retiformis*, but the former has larger corallites. Colonies from protected reefs may resemble *G. australensis*, but the latter is usually more meandroid.



A close view of the corallites.



Skeleton of *Goniastrea pectinata*.



A submassive colony of *Goniastrea pectinata*.

Goniastrea retiformis (Lamarck, 1816)

Chinese Name 網狀角星珊瑚

Family Faviidae

Publication *Astraea retiformis* Lamarck (1816)

Synonymy *Goniastrea retiformis* (Lamarck); Bernard (1900); Vaughan (1918); Yabe & Sugiyama (1935); Yabe et al. (1936); Eguchi (1938); Crossland (1952); Nemenzo (1959); Chevalier (1968, 1971); Scheer & Pillai (1974); Veron et al. (1977); Veron (1986); Nishihira & Veron (1995); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are usually massive, may be spherical or columnar, frequently exceed 1 m in diameter. Colonies from deeper water may become encrusting. Corallites are cerioid, with a neat cellular appearance due to its straight-sided walls with 4-6 angles. Calices have a uniform size of 3-5 mm in diameter. Septa are in three cycles, the first two are often indistinguishable. First order septa are slightly exsert, plunge steeply within the calice, and develop large paliform lobes which form a distinctive crown around the columella. On the inner margins of the first order septa are irregular dentations. Second order septa may be identical or shorter than those of first order, do not reach the columella nor form paliform lobes. Columella is small and trabecular.

Living colonies usually have uniform colors, mostly pale brown.

Ecology

Found in most coral reef environments, often a dominant species of the intertidal zones, where it frequently forms microatolls.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

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



A massive colony of *Goniastrea retiformis*.



A close view of the corallites.

Platygyra daedalea (Ellis & Solander, 1786)

Chinese Name 大腦紋珊瑚

Family Faviidae

Publication *Madrepora daedalea* Ellis & Solander (1786)

Synonymy *Coeloria rustica* (Dana); Yabe et al. (1936)

Platygyra rustica (Dana); Wells (1954, 1955); Ma (1959); Eguchi (1968); Utinomi (1971)

Platygyra daedalea (Ellis & Solander); Nemenzo (1959); Ma (1959); Pichon (1964); Chevalier (1968, 1975); Wijsman-Best (1972); Veron et al. (1977); Veron (1986); Nishihira & Veron (1995); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are massive, rounded or flattened; sometimes encrusting. Valleys are long and meandering in most colonies, although in some, the valleys are shorter, or are a mixture of both. The walls are narrow and often perforated. Septa are very exsert, usually with ragged or pointed tips. Septa of the first two orders, if recognizable, are equal, conspicuously dentate with large teeth, and descend abruptly down the valleys. The sides of the septa are finely granulated as with other *Platygyra*. Paliform lobes are poorly developed, usually found only in short, broad valleys. Columella is conspicuous, spongy, trabecular, and they are of variable widths.

Living colonies are in variable colors, usually brightly colored, such as brown walls with green valleys. In habitats where light is reduced, the colonies are darker.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

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

Remarks

Colonies from well illuminated reefs exposed to wave action tend to be spherical. Valleys are long and meandroid, of relatively constant lengths. Colonies exposed to strong currents are more heavily calcified, with skeletal structures sometimes markedly thickened. Colonies from turbid water, deep water, and on the sides of steep reef slopes tend to be flat. Valleys are long and straight, perpendicular to the edge of the colony, with narrow walls.



A colony of *Platygyra daedalea*.



A close view of valleys and walls.

Platygyra lamellina (Ehrenberg, 1834)

Chinese Name 片腦紋珊瑚

Family Faviidae

Publication *Maeandra lamellina* Ehrenberg (1834)

Synonymy *Platygyra lamellina* (Ehrenberg); Wells (1955); Ma (1959); Utinomi (1965, 1971); Chevalier (1968); Scheer & Pillai (1974); Veron et al. (1977); Veron (1986); Nishihira & Veron (1995); Veron (2000)



A colony of *Platygyra lamellina*.

Taxonomic Description & Diagnosis

Colonies are massive and rounded, occasionally with nodular mounds, and sometimes flat. Corallites are fully meandroid with elongated valleys. Valleys are almost always sinuous and long, except on concave surfaces where they may become short, sometimes even monocentric. The walls are characteristically thick, about 1-1.5 times the valley width. Septa are uniformly, slightly exsert and continuous across the walls. They are neat, rounded, and evenly spaced, with indistinguishable cycles. No paliform lobe is formed. Columella is usually narrow, may be well developed, but do not form a recognizable center.

Living colonies are in variable colors, usually brown, or brown walls with grey or green valleys.

Ecology

Occurs in most coral reef environments, most often found on reef slopes or back reef flat.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

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

Remarks

P. lamellina is usually distinguished from *P. daedalea* by its much thicker wall and markedly more rounded, less exsert septa. Colonies of this species with short valleys are readily distinguished from *P. sinensis* and *P. pini* also by the much thicker wall and differences in skeletal structure. This species also resembles *Goniastrea australensis*, but the latter is readily distinguished by their well defined centers and abundant paliform lobes.



A close view of the septa of *Platygyra lamellina*.



Skeleton of *Platygyra lamellina*.

Platygyra pini Chevalier, 1975

Chinese Name 小腦紋珊瑚

Family Faviidae

Publication *Platygyra pini* Chevalier (1975)

Synonymy *Platygyra pini* Chevalier; Wijsman-Best (1976); Veron et al. (1977); Veron (1986); Nishihira & Veron (1995); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are massive, may be rounded or flat, sometimes encrusting. Corallites are meandroid forming very short valleys, usually with only one or two recognizable centers. Walls are relatively thick, but this is variable. Septa are usually thin, but in colonies with greatly thickened walls, the septa may also be thickened as well. Septa have well formed dentations along their margins and fine granulations on their sides. The dentations sometimes form tiny horizontal plates. Distinctive paliform lobes are formed by one or several rows of septal dentations. Columella is usually well developed and trabecular, tending to form centers at the ends of valleys.

Living colonies are usually a uniform grey-brown, grey-green or yellow-brown, sometimes with green centers.

Ecology

Found in most coral reef environments.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

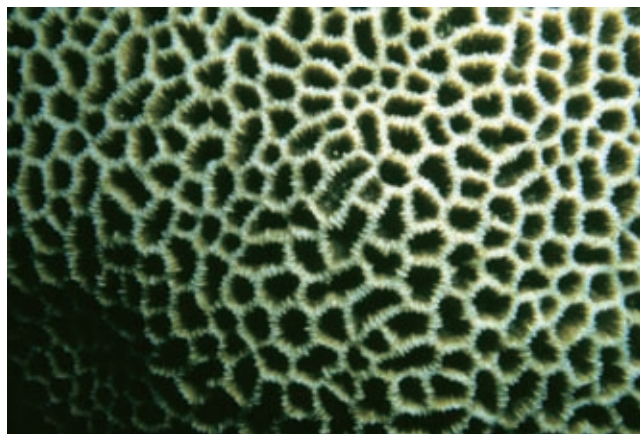
Widely distributed throughout the Indo-Pacific, from Sri Lanka to French Polynesia.

Remarks

This species closely resemble *P. sinensis*, both have very short valleys, but the former is readily distinguished by its thick walls, the presence of paliform lobes, and greater development of the columella.



A massive colony of *Platygyra pini*.



A close view of the corallites.

Platygyra ryukyuensis Yabe & Sugiyama, 1935

Chinese Name 琉球腦紋珊瑚

Family Faviidae

Publication *Platygyra ryukyuensis* Yabe & Sugiyama (1935)

Synonymy *Platygyra ryukyuensis* Yabe & Sugiyama; Nishihira & Veron (1995); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are massive. Corallites are meandroid, forming valleys that are mostly short, sometimes even monocentric or nearly so. Valleys are narrow, with a width of 3-4.5 mm, and walls are thin. Septo-costae are irregular and irregularly dentate. No paliform lobe is formed. Columella is conspicuous.

Living colonies may be dark brown, grey or green, usually the walls and valley floors are of contrasting colors.

Ecology

Most often found in shallow reef environments.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

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

Remarks

This species is similar to *Platygyra sinensis*, but the latter is distinguished by being much more meandroid and has wider valleys.



A massive colony of *Platygyra ryukyuensis*.



A close view of the corallites.

Platygyra sinensis (Edwards & Haime, 1849)

Chinese Name 中國腦紋珊瑚

Family Faviidae

Publication *Coeloria sinensis* Edwards & Haime (1857)

Synonymy *Platygyra sinensis* (Edwards & Haime); Wells (1954); Ma (1959); Chevalier (1968, 1975); Wijsman-Best (1972); Veron et al. (1977); Veron (1986); Nishihira & Veron (1995); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are massive and spherical, with a diameter that decreases rapidly as the water depth increases. Occasionally, the colonies are flat. Corallites are meandroid, usually forming very short valleys that are mostly monocentric, but long meandering valleys do occur in some colonies. Septa are thin, evenly spaced, and only slightly exsert. There are fine granulations on the sides of the septa and well formed dentations along their margins. Septal dentations may be large where the septa descend vertically down the valley. No paliform lobe is developed. Columella is narrow, mainly composed of loosely intertwined trabeculae.

Living colonies are often brightly colored, displaying a wide variety of colors.

Ecology

Found in most coral reef environments.

Occurrence

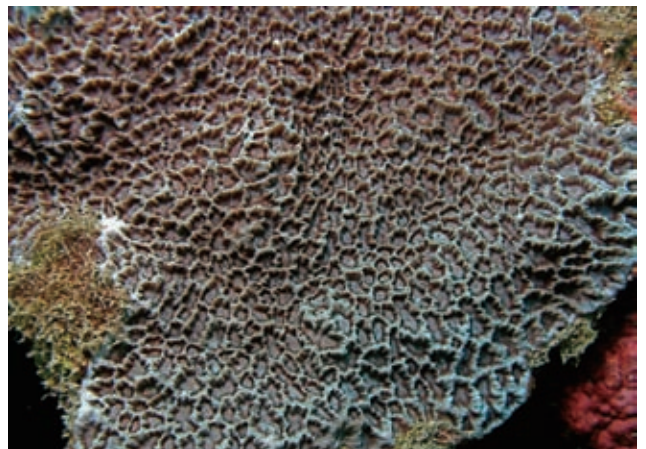
All reef areas around Taiwan and offshore islets.

Distribution

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



A massive colony of *Platygyra sinensis*.



A close view of the corallites.

Leptoria phrygia (Ellis & Solander, 1786)

- Chinese Name** 密集迷紋珊瑚
- Family** Faviidae
- Publication** *Madrepora phrygia* Ellis & Solander (1786)
- Synonymy** *Leptoria phrygia* (Ellis & Solander); Bernard (1900); Yabe & Sugiyama (1932, 1935); Eguchi (1935); Crossland (1952); Ma (1959); Chevalier (1968, 1975); Scheer & Pillai (1974); Veron et al. (1977); Veron (1986); Nishihira & Veron (1995); Veron (2000)
- Leptoria gracilis* (Dana); Yabe & Sugiyama (1935); Chevalier (1968)



A massive colony of *Leptoria phrygia*.

Taxonomic Description & Diagnosis

Colonies are usually massive, but are irregular in shape, usually with gently undulating surface. The skeleton is always highly calcified, very hard and dense. Corallites are meandroid with long valleys of indefinite length, constant width, and are usually very deep, which has very regular appearance. Septa are evenly spaced with constant interseptal distances and regularly sized, thus displaying a neat appearance. Those of adjacent valleys are usually adjoined. Septa are finely dentate down their margins and finely granulated on their sides. Columella is lobed, with the form of a single plate. Thecae are thick and dense.

Living colonies are brown, green or cream, the walls and valley floors are usually of contrasting colors.

Ecology

More commonly found on reef flat or reef slopes, where the current is strong. Polyps are only extended at night.

Occurrence

All reef area around Taiwan and offshore islets.

Distribution

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



A close view of the highly meandroid corallites.



Skeleton of *Leptoria phrygia*.

Oulophyllia bennettiae

(Veron, Pichon & Wijsman-Best, 1977)

Chinese Name 簡短耳紋珊瑚

Family Faviidae

Publication *Favites bennettiae* Veron et al. (1977)

Synonymy *Oulophyllia bennettiae* (Veron, Pichon & Wijsman-Best); Veron (1986); Nishihira & Veron (1995); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are massive or encrusting. Corallites are cerioid, large and angular, with calices averaging 10 mm in diameter when matured. Occasionally, corallites may be elongated and have two or three centers. Septa are arranged in two orders, the second order sometimes inconspicuous or absent. First order septa are prominent, widely spaced, strongly dentate, and with well developed paliform lobes. Septa of adjacent corallites are aligned and frequently exsert. Thecae are usually thick, columella is compact and spongy.

Living colonies are mostly uniform in color, usually grey or brown with grey-green oral disc.

Ecology

Uncommon, but found in many coral reef environments, most often on upper reef slopes.

Occurrence

Southern and Eastern Taiwan and Dongsha Atoll.

Distribution

Colonies from protected biotopes or from turbid waters are usually flat with very shallow, circular calices and coarse, lightly calcified septa.



A colony of *Oulophyllia bennettiae*.



A close view of the corallites.

Oulophyllia crisa (Lamarck, 1816)

Chinese Name 卷曲耳紋珊瑚

Family Faviidae

Publication *Maeandrina crisa* Lamarck (1816)

Synonymy *Oulophyllia crisa* (Lamarck); Matthai (1928); Yabe et al. (1936); Crossland (1952); Wijisman-Best (1972); Veron et al. (1977); Nishihira & Veron (1995); Veron (2000)

Coeloria gigantea Yabe & Sugiyama (1935); Yabe et al. (1936)

Coelogyra laevis Nemenzo (1959)

Taxonomic Description & Diagnosis

This is one of the most easily recognized species. Colonies are usually large and massive, hemispherical, and rarely encrusting. Corallites are meandroid, with comparatively short valleys and a few distinct calicular centers. Valley width averages 9-20 mm, at extremities may be 4-30 mm; valley depth averages 4.5-13.5 mm, at extremities may be 3-18 mm. Septa are thin and compact, arranged in two or three orders. First order septa are exsert above the common wall which is costate and usually thin and perforate on its upper part. Septa bear numerous small dentations along the upper margin, which may develop into paliform lobe at the center. Septal sides are granulated. Costae are thin and laminar, sometimes with few flattened, triangular spines. Columella is spongy, with papillae at the top.

Living colonies are grey, or with ridges brown and valley floor cream or pale yellow. The tips of polyp tentacles are white.

Ecology

Found in most coral reef environments, but uncommon. Polyps are large and fleshy, extended only at night.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

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

Remarks

Colonies may be flat, even surface with superficial ridges, to high, narrow and acute ridges. Valley length varies from being monocentric to having 20 centers.



A massive colony of *Oulophyllia crisa*.



A juvenile colony of *Oulophyllia crisa*.

Cyphastrea chalcidicum (Forskål, 1775)

Chinese Name 礁突細菊珊瑚
Family Faviidae
Publication *Madrepora chalcidicum* Forskål (1775)
Synonymy *Cyphastrea ocellina* Nemenzo (1959)
Cyphastrea chalcidicum (Forskål);
Crossland (1952); Yabe & Sugiyama (1935);
Yabe et al. (1936); Wells (1954); Nemenzo
(1959); Chevalier (1968); Veron et al. (1977)



A massive colony of *Cyphastrea chalcidicum*.

Taxonomic Description & Diagnosis

Colonies are massive or encrusting, frequently form columns. Corallites are usually conical and exsert. Calices are larger on convex surfaces, averaging 2 mm in diameter, and are usually much reduced on concave surfaces. 24 Septa are arranged in two distinct, unequal orders in mature calices. First order septa have long, irregular, granulated dentations. They can be divided into two hexamerous cycles in some colonies, with the primary septa being thicker and more exsert. Second order septa are much reduced. No paliform lobes are formed. Columella is small and trabecular. Costae are arranged in two distinctly unequal orders, with well developed first order costae, and second order being reduced or absent.

Living colonies display a wide range of colors.

Ecology

Occupies most coral reef environments, also found on rocky shores of the subtropics.

Occurrence

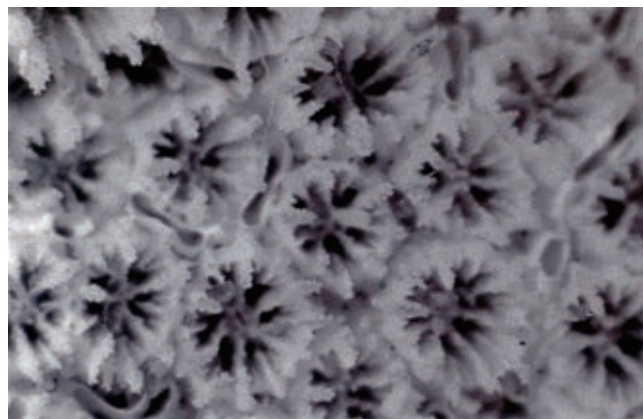
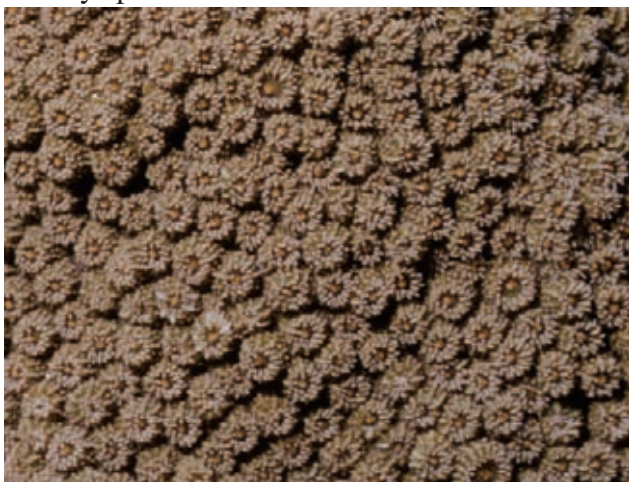
All reef areas around Taiwan and offshore islets.

Distribution

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

Remarks

Colonies from exposed biotopes are massive or encrusting, with exsert corallites and thickened calicular structures. Colonies from deep waters are thin and encrusting, flake-like, with very exsert, widely spaced corallites.



Corallites skeleton of *Cyphastrea chalcidicum*.

(x7)

A close view of corallites of *Cyphastrea chalcidicum*.

Cyphastrea japonica Yabe & Sugiyama, 1932

Chinese Name 日本細菊珊瑚

Family Faviidae

Publication *Cyphastrea japonica* Yabe & Sugiyama (1932)

Synonymy *Cyphastrea japonica* Yabe & Sugiyama (1932); Yabe & Sugiyama (1935); Yabe et al. (1936); Utinomi (1971); Veron et al. (1977); Nishihira and Veron (1995); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are sub-massive or encrusting, occasionally supporting short branches. Corallites are differentiated into axial and lateral corallites. Calices of axial corallites are 1.0-2.5 mm in diameter. Septa are usually arranged in three cycles with a hexamerall pattern. Sometimes the first two cycles are indistinguishable, and the tertiary cycle may not develop. The six primary septa are thicker and more exsert, without paliform lobes. Instead, knob-like paliform lobes are formed on thinner secondary septa. Calicular structures and septal margins are all very granulated. Columella is composed of one or several styliform processes. Costae are usually in three orders, but the third is usually reduced.

Living colonies are usually dull in color, mostly green or brown with pale or white axial corallites.

Ecology

Usually found in shallow exposed reef environments.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

Distributed in the west Pacific, from the Indonesian Archipelago, north to Japan.

Remarks

Colonies from protected biotopes and good illumination are usually submassive. Colonies from deep or turbid water are usually encrusting.



A massive colony of *Cyphastrea japonica*.



A close view of corallites of *Cyphastrea japonica*.

Cyphastrea microphthalma (Lamarck, 1816)

Chinese Name 小葉細菊珊瑚

Family Faviidae

Publication *Astraea microphthalma* Lamarck (1816)

Synonymy *Astraea microphthalma* Lamarck (1816)

Cyphastrea microphthalma (Lamarck); Vaughan (1918); Crossland (1952); Yabe & Sugiyama (1935); Yabe et al. (1936); Ma (1937); Eguchi (1938); Wells (1955); Nemenzo (1959); Utinomi (1971); Scheer & Pillai (1974); Chevalier (1975); Veron et al. (1977); Veron (1986); Nishihira and Veron (1995); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are usually encrusting, less often massive or sub-massive. Corallites are plocoid to cerioid, with calices 1-2 mm in diameter. Septa are arranged in two symmetrical orders, with only ten first order septa in the majority of mature calices, which separates this species from other *Cyphastrea*. First order septa are slightly exsert, with complex, irregular dentations and well developed paliform lobes. Second order septa are shorter and less exsert. Columella is composed of a few twisted trabeculae. Calicular structures are all very granulated. Costae are equal.

Living colonies have pale, uniform colors when exposed to good illumination; those from turbid or shaded habitats are usually dark colored, may be brown or green.

Ecology

Occurs in most coral reef environments, often found on reef walls.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

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

Remarks

Colonies from exposed biotopes are usually massive, with thick-walled, closely packed, large corallites. Those from protected biotopes tend to be encrusting, with thin and widely spaced corallites. Many colonies are infested with boring organisms which induce abnormal growth forms, resulting in irregularly sized and shaped corallites often with abnormally exsert septa.



A massive colony of *Cyphastrea microphthalma*.



A close view of corallites.

Cyphastrea serailia (Forskål, 1775)

Chinese Name 砂細菊珊瑚

Family Faviidae

Publication *Madrepora serailia* Forskål (1775)

Synonymy *Madrepora serailia* Forskål, 1775

Cyphastrea serailia (Forskål); Vaughan (1917, 1918); Yabe & Sugiyama (1935); Yabe et al. (1936); Eguchi (1938); Crossland (1952); Wells (1954, 1955); Nemenzo (1959); Chevalier (1968, 1975); Utinomi (1971); Veron et al. (1977); Nishihira and Veron (1995)

Cyphastrea suvadiuae Yabe, Sugiyama & Eguchi (1936)

Cyphastrea conferta Nemenzo, 1959

Taxonomic description and diagnosis

Colonies are massive or sub-massive, surface may be irregular, sometimes encrusting. Corallites are circular, plocoid about 3 mm exsert, to being sub-ceriod. Calices are 1.5-2.8 mm in diameter when corallites are matured. Septa are arranged in two very unequal, alternating orders, with 12 each. First order septa may plunge steeply or slope gently to the columella. They usually have irregular and elongate dentations, forming paliform lobes of a wide variety of shapes, varying from elongated pinnules to thick triangular wedges. Paliform crowns are usually developed. Second order septa are usually shorter than half the calice radius, and often become attached to the first order septa. Septa are all granulated on their margins and sides. Columella is inconspicuous and trabecular. Costae are poorly developed.

Living colonies display a wide range of colors, with no consistent trends in color variation. Dark colors are usually associated with low illuminations.

Ecology

Found in most coral reef environments.

Distribution

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

Remarks

Colonies from exposed biotopes are sub-massive and dense, with large, rounded corallites, thick thecae, and a conspicuous paliform crown. Colonies from semi-protected biotopes are thinly encrusted, with conical, exsert, irregular corallites that are widely separated. Colonies from sub-temperate biotopes are also thin and encrusting. Corallites have very granulated septa and thin, moderately exsert thecae.



A massive colony of *Cyphastrea serailia*.



A close view of corallites.

Montastrea annuligera (Edwards & Haime, 1849)

Chinese Name 小環圓菊珊瑚

Family Faviidae

Publication *Orbicella annuligera* Edwards & Haime (1849)

Synonymy *Montastrea annuligera* (Edwards & Haime); Veron et al. (1977); Veron (1986); Nishihira & Veron (1995); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are massive or encrusting. Corallites are plocoid and circular. Mature calices are uniformly sized, with 3-4 mm in diameter. Septa are usually arranged in three distinct orders, all are dentate and granulated. Six to ten of the first order septa are conspicuously exsert and thickened over the theca. Paliform lobes are thick and well developed, usually adjoined deep within the calice by a pseudo-synapticular ring, and they form a conspicuous paliform crown. Second order septa are usually less exsert, may reach the columella and may form paliform lobes. Third order septa are relatively short, extends on one-quarter to one-third of the septal radius, not forming paliform lobes. Costae are beaded and those of adjacent corallites are usually separated by intercalicular grooves. Columella is small, compact, and spongy or trabecular for those from turbid waters.

Living colonies are uniform green or brown with dark calices, or mottled.

Ecology

Usually found in protected reef slopes and lagoons. Budding is entirely extratentacular.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

Widely distributed throughout the Indo-Pacific, from the Red Sea and East Africa to New Caledonia.

Remarks

Colonies from turbid, protected waters may resemble *Leptastrea* spp. However, it can be distinguished from other *Leptastrea* species by the structures of paliform lobes, paliform crown, columella, and costae.



An encrusting colony of *Montastrea annuligera*.



A close view of the corallites.

Montastrea curta (Dana, 1846)

Chinese Name 簡短圓菊珊瑚
Family Faviidae
Publication *Orbicella curta* Dana (1846)
Synonymy *Orbicella curta* (Dana); Vaughan (1917, 1918); Hoffmeister (1925); Yabe & Sugiyama (1935); Yabe et al. (1936); Eguchi (1938); Crossland (1952)
Montastrea curta (Dana); Chevalier (1971); Veron et al. (1977); Veron (1986); Nishihira & Veron (1995); Veron (2000)



A colony of *Montastrea curta*.

Taxonomic Description & Diagnosis

Colonies are massive, spherical or flattened, occasionally they are encrusting. Corallites are plocoid, usually circular and moderately exsert when matured; sometimes they are squeezed into irregular shapes. Calices are 2.5-7.5 mm in diameter. Septa are arranged regularly in three orders, with the first and second orders often indistinguishable. All septa are conspicuously dentate and granulated. Paliform lobes are formed on both first and second order septa, but it is the former which have a well developed paliform crown. Third order septa are less exsert, sometimes short as ridges, do not reach the columella, nor form paliform lobes. Costae of adjacent corallites are not adjoined, and they are beaded. Columella is small, compact, and trabecular or spongy.

Living colonies are mostly cream or pale orange, usually darker where illumination is poor.

Ecology

Found in most coral reef environments, especially common on shallow reef flats. Budding is entirely extratentacular.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

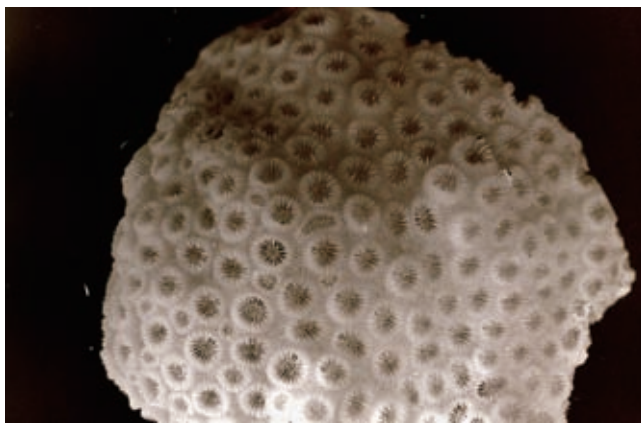
Widely distributed throughout the Indo-Pacific, from Madagascar to Tuamotu Archipelago.

Remarks

Colonies from exposed biotopes are usually small, massive and spherical. Corallites are small and walls are thick. Colonies from protected biotopes may be massive or encrusting.



A close view of the polyps showing extratentacular budding.



Skeleton of *Montastrea curta*.

Montastrea magnistellata Chevalier, 1971

Chinese Name 大圓菊珊瑚

Family Faviidae

Publication *Montastrea magnistellata* Chevalier (1971)

Synonymy *Montastrea magnistellata* Chevalier; Veron et al. (1977); Veron (1986); Nishihira & Veron (1995); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are massive, hemispherical, flattened or irregular in shape, sometimes are encrusting. Corallites are sub-plocoid and circular, slightly exsert, with a diameter of 7.3-15.1 mm. Septa are arranged in two alternating orders, with constant interseptal distances. First order septa are covered with large, conspicuous and granulated dentations, forming a circle of paliform lobes. Second order septa are small, thinner and less exsert than first order septa. Costae are usually unequal but well developed, with those of adjacent corallites sometimes separated by a small ridge. Columella may be trabecular, spongy or very compact.

Living colonies display a variety of pale colors with darker sides; may become dark colored in shaded habitats.

Ecology

Occur in many coral reef environments, most often found on protected reef slopes.

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

Colonies from protected habitats are encrusting, with large, shallow corallites and fine septa, and they are dark colored. Colonies from more exposed environment are more massive, more heavily calcified, with deeper calices.



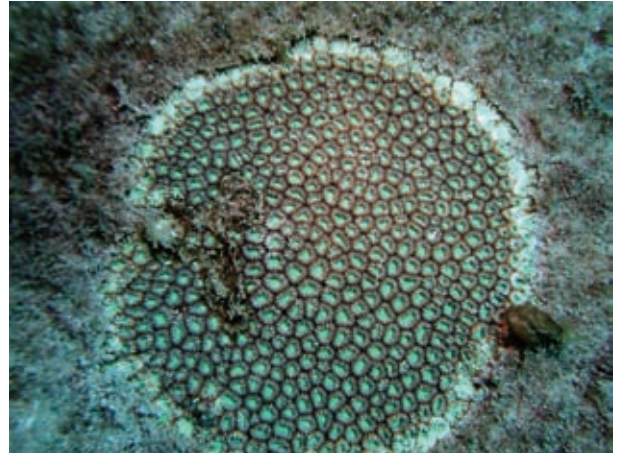
A colony of *Montastrea magnistellata*.



A close view of the corallites.

Montastrea valenciennesi (Edwards & Haime, 1848)

Chinese Name	華倫圓菊珊瑚
Family	Faviidae
Publication	<i>Phymastrea valenciennesi</i> Edwards & Haime (1848)
Synonymy	<i>Phymastrea valenciennesi</i> Yabe & Sugiyama (1935); Yabe et al. (1936) <i>Favia valenciennesi</i> (Edwards & Haime); Crossland (1952); Wells (1954); Nemenzo (1959); Ma (1959); Utinomi (1965); Chevalier (1971); Wijsman-Best (1972); Scheer & Pillai (1974) <i>Montastrea valenciennesi</i> (Edwards & Haime); Veron et al. (1977); Veron (1986); Nishihira & Veron (1995); Veron (2000)



A small colony of *Montastrea valenciennesi*.

Taxonomic Description & Diagnosis

Colonies are massive, rounded or flattened, sometimes encrusting. The surface of the colonies may be even and regular or convoluted in those with tightly interlocking, twisted calices. Corallites are plocoid and polygonal, usually hexagonal, with a diameter of 8-15 mm. Calices may be uniform or variable, frequently with deep division in between.

Septa are usually arranged in three orders, occasionally with a fourth order present. All septa have large and conspicuous dentations. First order septa are thickened along their inner margins and over the thecae, sometimes six of them may be especially exsert and distinguished from others of the first order. They usually have well developed paliform lobes which form a distinct crown. Second order septa are sometimes thickened, reach the columella, but no paliform lobe is formed. Third order septa are much shorter, and they may fuse with second order septa. Columella is small, compact and spongy or loosely trabecular.

Living colonies are in a wide variety of colors, most frequently green, yellow or mottled, and the coenosarcs and the oral disc are always of different colors.

Ecology

Found in most coral reef environments, most often occurs where current is stronger.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

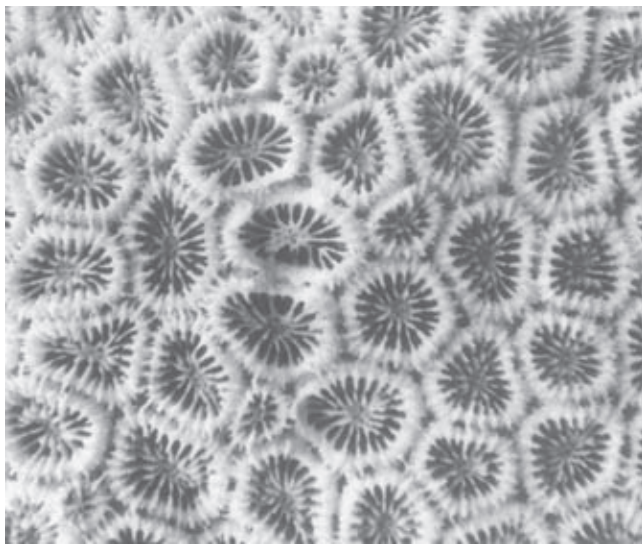
Widely distributed throughout the Indo-Pacific, from Madagascar to Marshall Islands.

Remarks

This species has a distinct characteristic, “groove and tubercle” structures, which are interspersed between most calices. These structures consist of very thin walled tubes of less than 0.5 mm in diameter, with circular or elongated openings on their upper surfaces. Colonies from shallow reef environments with clear water are massive and heavily calcified. Corallites are large, with thick and exsert septa. Paliform lobes and a well defined crown are developed. Colonies from deep or relatively turbid waters are flat or encrusting, with small calices, thin thecae, thin septa, and little or no formation of paliform lobes.



A close view of the corallites.



Skeleton of *Montastrea valenciennesi*.



A submassive colony of *Montastrea valenciennesi*.

Echinopora gemmacea (Lamarck, 1816)

Chinese Name	小芽棘孔珊瑚
Family	Faviidae
Publication	<i>Explanaria gemmacea</i> Lamarck (1816)
Synonymy	<i>Echinopora gemmacea</i> (Lamarck); Chevalier (1975); Nishihira & Veron (1995); Veron (2000)



A colony of *Echinopora gemmacea*.

Taxonomic Description & Diagnosis

Colonies are laminar, sometimes with subdendroid proliferations or rarely being thick and encrusting. Corallites are circular and superficial to conical and protruding, with a diameter of up to 5 mm. Those on colony margins are smaller, and inclined towards the periphery. Septa are arranged in three cycles, occasionally a fourth rudimentary, abortive cycle may be present. Primary septa are very exsert, thick at the wall and thin in the center. They have prominent upper lobe, which is markedly exsert above the thecae. Paliform lobes are poorly developed. Columella is well developed and spongy. Costae are present and fused together, bearing 1-4 well developed spines, with thick bases and granulated or echinulated tips. The exotheca is mostly compact, composed of fuse exothecal costae.

Living colonies are usually grey, sometimes pale cream to dark brown or green.

Ecology

Usually found on protected reef slopes or reef flats.

Occurrence

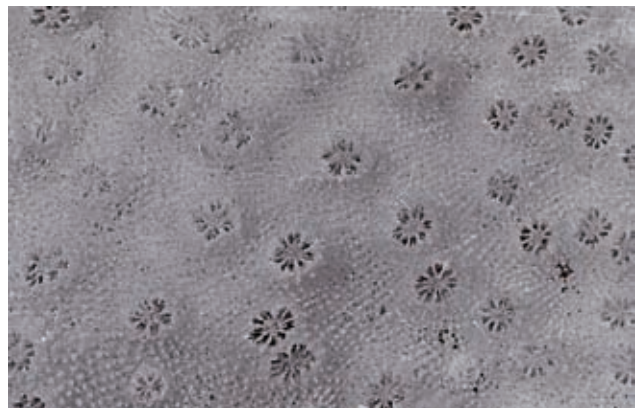
All reef areas around Taiwan and offshore islets.

Distribution

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



A close view of colony edge.



Skeleton of *Echinopora gemmacea*.

Echinopora lamellosa (Esper, 1795)

Chinese Name	片形棘孔珊瑚
Family	Faviidae
Publication	<i>Madrepora lamellosa</i> Esper (1795)
Synonymy	<i>Echinopora lamellosa</i> (Esper); Vaughan (1918); Yabe et al. (1936); Crossland (1952); Wells (1954); Nemenzo (1959); Scheer & Pillai (1974); Chevalier (1975); Veron (2000)



A foliaceous colony of *Echinopora lamellosa*.

Taxonomic Description & Diagnosis

Colonies are laminar or foliaceous, which usually expand horizontally forming whorls or tiers. Occasionally, they may expand vertically, forming hollow, funnel-shaped protuberances. Large colonies of over 5 m are not unusual, and they are usually bifacial. Corallites are circular, conical or cylindrical, relatively thin walled, with small calices of 2.5-4.0 mm in diameter. Septa are arranged in three cycles, sometimes a fourth rudimentary cycle may be present. Primary septa are markedly exsert, with margins bearing small granules or dentations. Septal sides are ornamented with numerous, slightly elongated or lamellar granulations. Secondary septa may be equally well developed but slightly smaller, with structures similar to the primary ones. Paliform lobes are generally present as a ring in front of the first two cycles of septa. Columella is well developed, spongy and trabecular. Costae are generally more distinct towards the upper margin, bearing one to three conspicuous spines whose tips are granulated. Exothecal costae are also covered by spines that are arranged in regular parallel rows.

Living colonies display a variety of colors, from amber, pale to dark brown, greenish, often with dark brown or green calices. The margins of the colonies are usually lighter colored.

Ecology

Usually found on reef slopes or reef flats where the current is not too strong.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

Widespread in the Indo-Pacific, from the Red Sea to French Polynesia.

Remarks

Although this species displays a wide range of intraspecific variations in colony shapes and skeletal structures, the uniform distribution of costal spines, which are always comparatively well developed and close together, are characteristic of the species.



A close view of the corallites and coenosteum.



Skeleton of *Echinopora lamellosa*.



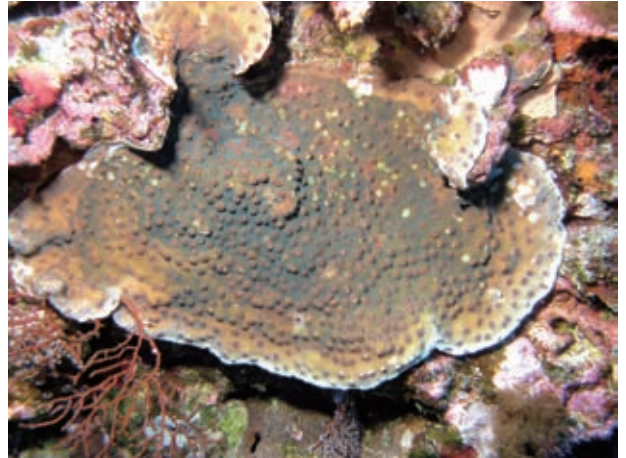
A large colony of *Echinopora lamellosa*.



A colony of *Echinopora lamellosa* with protuberances.

Echinopora pacificus (Veron, 1990)

Chinese Name 太平洋棘孔珊瑚
Family Faviidae
Publication *Echinopora pacificus* Veron (1990)
Synonymy *Echinopora pacificus* Nishihira & Veron (1995); Veron (2000)



A foliaceous colony of *Echinopora pacificus*.

Taxonomic Description & Diagnosis

Colonies are foliaceous and plate-like, usually unifacial, with centers encrusting and margins laminar. Corallites are plocoid, and up to 10 mm in diameter. Septo-costae are arranged in two orders, only the primary septa are well developed with exsert septal teeth. Paliform lobes are not exsert. Columella is prominent. Costae are beaded, and mostly restricted to the corallite wall. The coenosteum is granulated.

Living colonies are usually green, yellowish or grey-brown.

Ecology

Found in most shallow reef environments, but they are usually uncommon. Tentacles are extended only at night.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

Widely distributed in west Pacific, from Okinawa to the Great Barrier Reef.

Remarks

This species is similar to *Echinopora lamellosa*, the former is distinguished by the larger corallites, forming smaller colonies with less development of plates.



A close view of corallites of *Echinopora pacificus*.



Corallites and coenosteum of *Echinopora pacificus*.

Merulina ampliata (Ellis & Solander, 1786)

Chinese Name 片形繩紋珊瑚

Family Faviidae

Publication *Madrepora ampliata* Ellis & Solander (1786)

Synonymy *Merulina ampliata* (Ellis & Solander); Vaughan (1918); Yabe et al. (1936); Crossland (1952); Stephenson & Wells (1955); Nemenzo (1959); Ma (1959); Scheer & Pillai (1974); Veron & Pichon (1980); Veron (1986), Nishihira & Veron (1995); Veron (2000)
Merulina regalis Ma (1959)

Taxonomic Description & Diagnosis

Colonies are laminar, encrusting, or horizontal plates, when colonies are large, these plates may form overlapping tiers attaining several meters in diameter. The central part of the plates may become hillocky, which subsequently may develop into short, blunt bifacial branches, and may eventually divide and become highly anastomosed. Valleys of variable length radiate from the center of plates, and are perpendicular to plate margin. Valleys contain 1-10 centers which are 3-7 mm apart. Septa are in two alternating orders. First order septa are regularly exsert, adjoined over the walls with those of adjacent valleys. Septal margins are densely covered by granulated dentations, septal sides are also granulated.

Living colonies are in a variety of pale colors, usually brown or cream.

Ecology

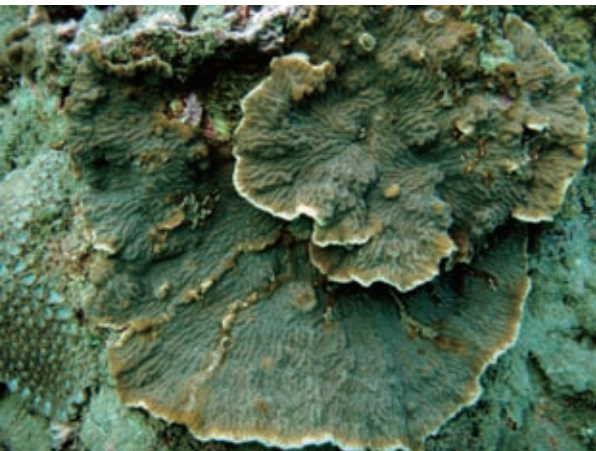
Found in most reef environments, especially lower reef slopes.

Occurrence

All reef areas in Taiwan.

Distribution

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



A laminar colony of *Merulina ampliata*.



A close view of the radiating collines.

Merulina scabricula Dana, 1846

Chinese Name 皺褶繩紋珊瑚

Family Faviidae

Publication *Merulina scabricula* Dana (1846)

Synonymy *Merulina scabricula* Dana; Chevalier (1975); Veron (1986); Nishihira & Veron (1995); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are laminar, encrusting, horizontal plates, or sub-arborescent. Valleys are short and straight, spreading in a fan-like manner before dividing. They radiate from the center of plates, thus are often perpendicular to plate margin, but become highly contorted on branches. Concentric growth lines are often seen on flat surfaces. Septa are irregular and exsert, usually adjoined over the walls with those of adjacent valleys.

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

Ecology

Found in most reef environments, especially in lagoons and on upper reef slopes.

Occurrence

All reef areas in Taiwan except northern and northeastern coasts.

Distribution

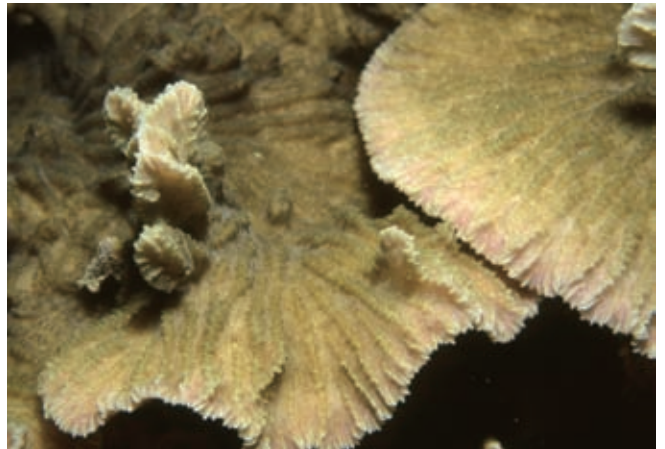
Widely distributed throughout the Indo-Pacific, from Bay of Bengal to Japan, Marshall Islands and Samoa. Also recorded from southwest Indian Ocean.

Remarks

This species is similar to *Merulina ampliata*, but the former is distinguished by its thicker, coarser skeletal structures.



A colony of *Merulina scabricula*.



A close view of the collines and valleys.

Scapophyllia cylindrica Edwards & Haime, 1846

Chinese Name 紋柱珊瑚

Family Faviidae

Publication *Scapophyllia cylindrica* Edwards & Haime, 1846

Synonymy *Scapophyllia cylindrica* Edwards & Haime; Yabe et al. (1936); Ma (1959); Scheer & Pillai (1974); Veron & Pichon (1980); Veron (1986); Nishihira & Veron (1995); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are thick laminar plates, on which develops blunt-ended columns that are often >15 cm thick and up to 60 cm high. These plates are irregular in shape and uneven in surface; columns may divide into sub-branches that do not anastomose. Valleys are 1.5-3 mm wide and up to 3 mm deep, sinuous on columns and straight, parallel on plates, running perpendicular to the margin. Walls are thicker on convex than concave surfaces. Septa are in two alternating orders. First order septa are evenly exsert, irregular, and usually not adjoined to those of adjacent valleys. They are thickened towards the valley floor, forming horizontal elements that converge to the center.

Living colonies are usually cream or yellow-brown.

Biology

Found in many reef environments, most often occur in partly turbid waters.

Occurrence

Southern Taiwan, Xiaoliuchiu, Ludao, Lanyu.

Distribution

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

Remarks

Columnar colonies are predominantly found in shallow reef biotopes, while plate-like colonies are mostly found in more turbid biotopes. This species is seldom seen in highly turbid protected waters.



A large colony of *Scapophyllia cylindrica*.



A close view of the columns.

Hydnophora bonsai Veron, 1990

Chinese Name 膨礁珊瑚

Family Faviidae

Publication *Hydnophora bonsai* Veron (1990)

Synonymy *Hydnophora bonsai* Nishihira & Veron (1995), Veron (2000)

Taxonomic Description & Diagnosis

Colonies are encrusting, sometimes forming short branches which are irregular in section. Monticules are fine and small, may be conical with circular section, or elongated with flattened to acute tops. Sometimes adjacent monticules are fused into irregular ridges, especially towards the end of the branches.

Living colonies are green or pale brown.

Ecology

Usually found on rocky foreshores.

Occurrence

Southern Taiwan, Penghu Islands, Ludao and Dongha Atoll.

Distribution

Restricted to waters between southern Taiwan to southern Japan.

Remarks

This species is similar to *Hydnophora exesa*, but the former has skeletal structures that are much smaller.



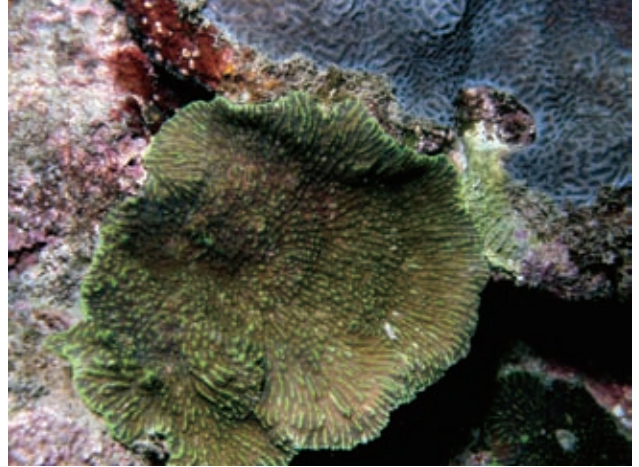
A colony of *Hydnophora bonsai*.



A close view of branches showing the irregular ridge.

Hydnophora exesa (Pallas, 1766)

Chinese Name 大碓珊瑚
Family Faviidae
Publication *Madrepora exesa* Pallas (1766)
Synonymy *Hydnophora exesa* (Pallas);
Vaughan (1918); Yabe & Sugiyama
(1935); Yabe et al. (1936); Eguchi
(1938); Nemenzo (1959); Scheer &
Pillai (1974); Veron et al. (1977); Veron
(1986); Nishihira & Veron (1995);
Veron (2000)



A laminar colony of *Hydnophora exesa*.

Taxonomic Description & Diagnosis

Colonies are usually laminar, encrusting or sub-arborescent, with irregular, cylindrical branches averaging 4-7.5 cm in diameter, and up to 20 cm high. Sometimes the colony may be up to 7 mm thick in the center, becoming submassive and hemispherical. Monticules are conical and circular to flat and elongated, with a diameter of 5-8 mm, up to 8 mm high and 5 mm wide at their base. The monticules are evenly distributed or arranged in regular rows, separating valleys 3-6 mm in width. Adjacent monticules may fuse to form ridges. About 6-12 septa may reach the top of the monticules, where they are thin, narrow and without septal dentations. Septa in the valleys are thick and broad, more dentate, with granular sides. Columella is trabecular, laminar or absent.

Living colonies are cream or dull brown.

Ecology

Found in all reef environments, especially on protected slopes and lagoons.

Occurrence

All reef areas in Taiwan.

Distribution

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



A close view of the monticules and polyps.



Skeleton of *Hydnophora exesa*.

Hydnophora grandis Gardiner, 1904

Chinese Name 大碓珊瑚
Family Faviidae
Publication *Hydnophora grandis* Gardiner (1904)
Synonymy *Hydnophora grandis* Gardiner; Veron (2000)

Taxonomic Description & Diagnosis

Colonies are ramose, composed of irregular branches, with little tendency to form an encrusting base. Branches are 10-15 mm in thickness and mostly circular in section. Monticules are distributed irregularly on the colonies. They are usually large and flat, with circular to elongated section; sometimes the tops may be acute. Monticules have little tendency to fuse with each other. Those near the tip of the branches tend to be inclined in that direction.

Living colonies are cream, yellowish or green.

Ecology

Usually found in shallow reef environments.

Occurrence

Only found in Dongsha lagoon, very abundant in some shallow-water area.

Distribution

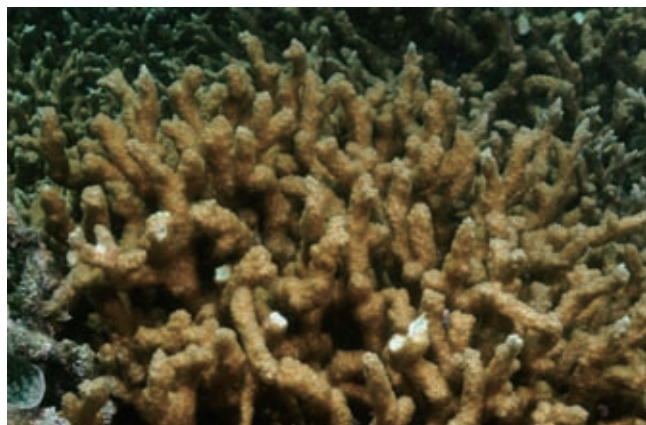
Widely distributed throughout the Indo-west Pacific, from the Maldives to Marshall Islands and Samoa.

Remarks

This species is similar to *Hydnophora ridiga*, the latter usually having finer branches that are flattened, with smaller and fused monticules.



A large colony of *Hydnophora grandis*.



A close view of branches of *Hydnophora grandis*.

Hydnophora microconos (Lamarck, 1816)

Chinese Name 小礁珊瑚

Family Faviidae

Publication *Monticularia microconos* Lamarck (1816)

Synonymy *Hydnophora microconos* (Lamarck); Vaughan (1918); Yabe et al. (1936); Crossland (1952); Wells (1954); Nemenzo (1959); Chevalier (1968); Scheer & Pillai (1974); Veron et al. (1977); Veron (1986); Nishihira & Veron (1995); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are massive and usually rounded, may form microatolls on shallow reef flats. Monticules are conical to flat-topped cylindrical or elongate, with a diameter of 2-3 mm. Valleys between monticules are comparatively narrow, averaging 2-3 mm in width. 6-10 first order septa are present and horizontal at the top of each monticule, making the top star-shaped. Septal dentations are only developed on lower parts of the septa near the columella. Septa margin are finely granulated. Columella is lamellar, continuous, and encircles the monticules.

Living colonies are dull cream, brown or green.

Ecology

Found in all reef environments, most often occur in lagoons and protected reef slopes.

Occurrence

All reef areas in Taiwan.

Distribution

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



A massive colony of *Hydnophora microconos*.



A close view of the colony surface.

Hydnophora rigida (Dana, 1846)

Chinese Name 細枝確珊瑚

Family Faviidae

Publication *Merulina laxa* Dana (1846)

Synonymy *Hydnophora rigida* (Dana); Vaughan (1918); Yabe et al. (1936); Stephenson & Wells (1955); Nemenzo (1959); Veron et al. (1977); Veron (1986), Nishihira & Veron (1995); Veron (2000)
Hydnophora ramosa Nemenzo (1959)

Taxonomic Description & Diagnosis

Colonies are always ramose, composed of irregular, flattened or cylindrical branches mostly of diameters 6-12 mm, with blunt to tapering ends. Monticules are arranged in irregular rows all along the branches, with a circular or slightly elongated section and flat tops. Diameters of circular monticules may be up to 6 mm. Towards the tips of the branches, monticules become more conical, with a tendency to fuse with each other forming ridges that are often with acute upper edge. Valleys between adjacent rows of fused monticules are irregular and discontinuous or well defined, long and linear. Usually 8-14 septa radiate around the monticules, sometimes more. Septal dentations are obsolete or minute, sides are spinose. Columella center is well defined.

Living colonies are usually cream or green.

Ecology

Found in shallow reef environments, especially protected reef slopes and lagoons.

Occurrence

All reef areas in Taiwan and offshore islets.

Distribution

Widely distributed throughout the Indo-Pacific, from southwest Indian Ocean to Marshall Islands and Samoa.

Remarks

Colonies with thinner branches often have the branches being distantly spaced. Colonies with thicker branches usually have branches in close proximity, appearing bushy.



A ramous colony of *Hydnophora rigida*.



A close view of the branch tips.

Pectinia lactuca (Pallas, 1766)

Chinese Name 蒿苳梳珊瑚

Family Faviidae

Publication *Madrepora lactuca* Pallas (1766)

Synonymy *Madrepora lactuca* (Pallas); Veron & Pichon (1980); Veron (1986); Nishihira & Veron (1995); Veron (2000)

Taxonomic Description & Diagnosis

Colonies form thick, horizontal plates, frequently over 1 m in diameter, with elongate radiating valleys of up to 4 cm in width, and extending from the center to colony margin. Collines are thin, vertical, and of relatively uniform height. They are usually highly perforate, with upper margins appearing ragged. A single series of centers are formed along the valley axis, or near the valley floors, but not on the collines. Septo-costae usually extend from top of collines to valley floors. They are around 3 mm in width, spaced 2-4 mm apart, with granulated sides and irregularly dentate margins. Low elongate paliform lobes may form poorly defined crown on some septa. Columella is not well developed, may be trabecular or consists of twisted inner margins of major septa rotated in a clockwise direction.

Living colonies are usually uniform grey, brown or green.

Ecology

Common in most reef environments, especially protected lower reef slopes and turbid waters. Rarely occur in habitats exposed to strong or moderate wave action. Initial budding is circumoral, with no central corallite.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

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

Remarks

Colonies from deep or turbid waters have thin, highly perforated collines and fine septo-costae. Those in more exposed biotopes, their collines and septo-costae are thicker, and columella are better developed.



A colony of *Pectinia lactuca*.



A close view of the collines.

Pectinia paeonia (Dana, 1846)

Chinese Name 牡丹梳珊瑚

Family Faviidae

Publication *Tridacophyllia paeonia* Dana (1846)

Synonymy *Pectinia paeonia* (Dana); Veron & Pichon (1980); Veron (1986); Nishihira & Veron (1995); Veron (2000)

Taxonomic Description & Diagnosis

Colonies form irregular clusters of fluted, thin laminae, which never extend into long valleys, and they are frequently over 1 m in diameter. Vertical collines may be plate-like or upwardly projecting spires, formed by the thickening and upward growth of exsert, major septo-costae. Centers may be in short series, seated deeply among the collines. Budding occurs on the valley floors, rather than on collines. Septa are not arranged in orders, and vary greatly in size. Septal margins are usually smooth or finely dentate; septal sides may be smooth or finely granulated. Columella is small and trabecular, consisting mostly of inner margins of septa, which bears fine, elongate, twisted dentations.

Living colonies are usually uniform or mottled grey, brown or green.

Ecology

Common and only occurs in relatively protected environments, especially in turbid waters and crevices on reef slopes.

Occurrence

All reef areas in Taiwan and offshore islets, but very rare in southern reefs.

Distribution

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

Remarks

Colonies from very protected habitats are extremely delicate, with thin, twisted, irregular collines and fine, smooth septa. Those in more exposed habitats, their collines are pinnacle-like with finely dentate septa. This species is similar to *P. alcicornis*, but the latter is easily distinguished by its thicker, coarser skeletal structure, conspicuous septal dentations and relatively large columella.



A colony of *Pectinia paeonia* in turbid environment.



A close view of a small colony.

Mycedium elephantotus (Pallas, 1766)

Chinese Name 象鼻斜花珊瑚
Family Faviidae
Publication *Madrepora elephantotus* Pallas (1766)
Synonymy *Mycedium elephantotus* (Pallas); Yabe & Eguchi (1935); Yabe et al. (1936); Eguchi (1938); Ma (1959); Nemenzo (1959); Chevalier (1975); Veron & Pichon (1980); Veron (1986); Nishihira & Veron (1995); Veron (2000)
Mycedium tenuicostatum Yabe & Eguchi (1935); Yabe et al. (1936); Eguchi (1938); Ma (1959)



A foliaceous colony of *Mycedium elephantotus*.

Taxonomic Description & Diagnosis

Colonies are encrusting to foliaceous, may be over 3 m in diameter, and sometimes forming overlapping tiers. Corallites are nose-shaped, with a diameter of 0.9-1.9 cm. They are irregularly distributed and inclined towards the colony periphery. Septa are usually arranged in three orders, with the third order being very fine, forming no costae. First order septa are irregularly exsert, forming finely serrated costae, which have lobed dentations. The dentations usually appear as low ridges or thickening of the costae. Columella may be large and compact, or consisting of twisted septal dentations. Coenosteum is smooth, with no alveoli.

Living colonies display a wide variety of colors, usually uniformly brown, grey, pink, or green, sometimes with white, red or green oral discs.

Ecology

Found in most reef environments, especially habitats protected from strong wave action.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

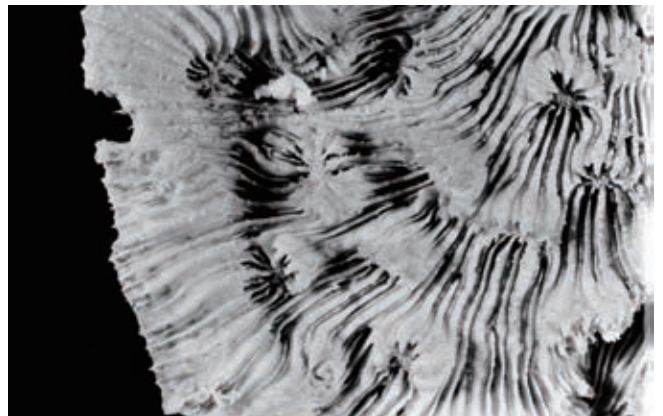
Widely distributed throughout the Indo-Pacific, from the Red Sea and East Africa to Fiji.

Remarks

Colonies from protected habitats are encrusting, with large, shallow corallites and fine septa, and they are dark colored. Colonies from exposed environment are more massive, more heavily calcified, with deeper calices.



A close view of the nose-shaped corallites.



Skeleton of *Mycedium elephantotus*.

Mycedium robokaki Moll & Borel-Best, 1984

Chinese Name 小斜花珊瑚

Family Faviidae

Publication *Mycedium robokaki* Moll & Borel-Best (1984)

Synonymy *Mycedium robokaki* Nishihira & Veron (1995); Veron (2000)

Taxonomic description and diagnosis

Colonies are foliaceous, forming thin, unifacial laminar plates, with a thickness of 5-8 mm. Margins may be wavy, sometimes forming irregularly, overlapping whorls. Corallites are nose-shaped, with a diameter of 4-6 mm. They are usually irregularly distributed and strongly inclined towards the colony periphery, but may be arranged in concentric rows in some colonies. Septo-costae are compact and usually arranged in two to three orders, bearing fine, ornamented spines.

Living colonies are uniformly tan to pinkish, usually with pale colonies margins.

Ecology

Usually occurs in habitats protected from strong wave action, but is uncommon.

Occurrence

Reef areas along southern and eastern coast of Taiwan, and Dongsha Atoll.

Distribution

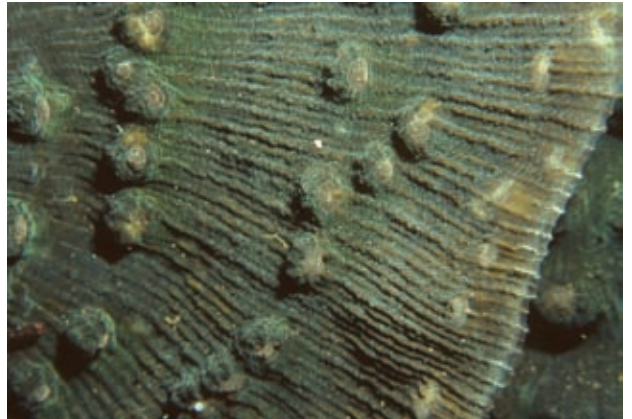
Distributed mainly in the west Pacific, from Indonesia to Okinawa.

Remarks

This species is similar to *M. elephantotus*, but the latter is distinguished by their larger corallites and more compact, thicker laminar plates.



A foliaceous colony of *Mycedium robokaki*.



A close view of the nose-shaped corallites.

Plesiastreidae

This new family is established mainly based on the results of molecular phylogenetic studies (Fukami et al. 2008). It contains *Plesiastrea* from traditional Faviidae, *Physogyra* and *Plerogyra* from Euphyllidae, and *Blastomussa* from Mussidae. *Plesiastrea* is designated type genus of this family.

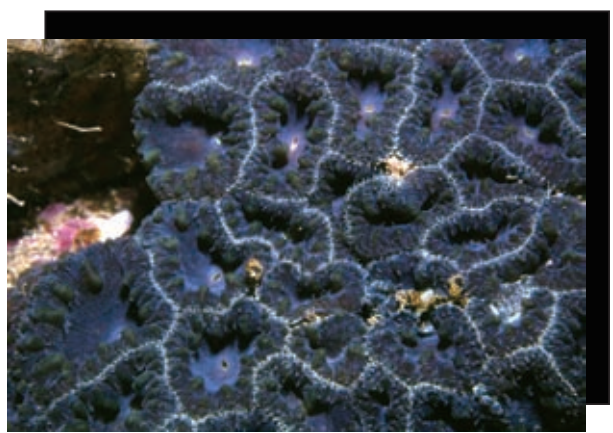
Coral colonies of *Plesiastrea* are plocoid with round corallites formed by extra-tentacular budding. Septa are in three orders with well developed paliform lobes around the columellae. Colonies of *Blastomussa* are phaceloid to subplocoid with corallites formed by extra-tentacular budding. Colonies of *Plerogyra* are flabelloid with large, solid and exsert septa. Colonies of *Physogyra* are meandroid with short, widely spaced valleys. The diagnostic morphological features of this family need further studies.

Simplified key to genera of Plesiastreidae

Colonies subcerioid to plocoid	<i>Plesiastrea</i>
Colonies phaceloid to plocoid	<i>Blastomussa</i>
Colonies covered with vesicles during the day	
Vesicles less readily retractable.....	<i>Plerogyra</i>
Vesicles bifurcated, more readily retractable.....	<i>Physogyra</i>



A colony of *Physogyra*.



A colony of *Blastomussa*.

Plesiastrea versipora (Lamarck, 1816)

Chinese Name 多孔圓星珊瑚

Family Plesiastreidae

Publication *Astraea versipora* Lamarck (1816)

Synonymy *Plesiastrea versipora* (Lamarck); Crossland (1952); Wells (1954, 1955); Chevalier (1968, 1971); Eguchi (1968); Scheer & Pillai (1974); Veron et al. (1977); Veron (1986); Nishihira & Veron (1995); Veron (2000)

Orbicella versipora (Lamarck); Vaughan (1918); Yabe & Sugiyama (1935); Yabe et al. (1936); Eguchi (1938)

Taxonomic description and diagnosis

Colonies are massive, flattened and frequently lobed, or encrusting. Corallites are rounded, sub-ceroid or plocoid, 2-4 mm in diameter. Septa are arranged in three orders, with the first two often indistinguishable. First order septa are exsert, with well developed paliform lobes varying from thick wedges to fine pinnacles, which in turn form a conspicuous crown around the columella. Second order septa are smaller, may not have paliform lobes. Third order septa are even more reduced. Septa and paliform lobes are all granulated. Columella is small. Coenosteum may be smooth or granulated.

Living colonies are usually cream, green, or brown. They are usually pale colored in the tropics and brightly colored in high latitude areas or exposed biotopes.

Ecology

Occurs in most coral reef environments, most often found in deeper reef slopes where the current is strong, or in shaded biotopes. Tentacles are of two alternating sizes, sometimes extended during the day.

Occurrence

All reef areas around Taiwan and offshore islets.

Distribution

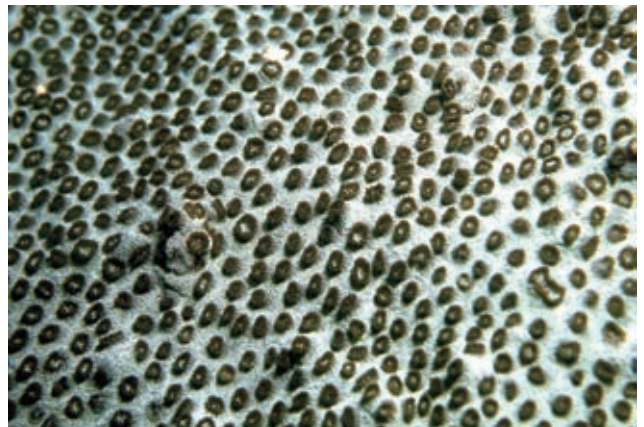
Widely distributed throughout the Indo-Pacific, from the Red Sea and East Africa to Japan and Easter Island.

Remarks

Colonies from exposed biotopes are massive and dense. Corallites are often sub-ceroid with distorted, irregular shapes. Colonies from protected biotopes are flattened or encrusting. Corallites are widely spaced and relatively exsert. Colonies from high latitudes are usually encrusting, with plocoid and compact corallites.



A colony of *Plesiastrea versipora*.



A close view of corallites with tentacles extended.

Blastomussa merleti (Wells, 1961)

Chinese Name	小棘菊珊瑚
Family	Plesiatreidae
Publication	<i>Bantamia merleti</i> Wells (1961)
Synonymy	<i>Blastomussa merleti</i> (Wells); Chevalier (1975); Veron & Pichon (1980); Veron (1986), Nishihira & Veron (1995); Veron (2000)

Taxonomic description and diagnosis

Colonies are phaceloid to plocoid and monocentric. Corallites are less than 7 mm in diameter, with deep calices and regularly spaced. Intercorallite space is covered by expanded mantle which often form a continuous surface obscuring the skeletal structure underneath. Septa are arranged in three distinct cycles, with the first order septa reaching the columella. Those of higher orders are progressively reduced. All septa have serrated inner margins and granulated sides. Columella is developed.

Mantles may be pink, orange, brown or dark grey, but are commonly dark red or pale brown with yellow-green oral discs.

Ecology

Found in many reef environments, especially where turbidity is high. Budding is extratentacular, with initial horizontal growth of daughter corallites, then becoming erect.

Occurrence

All reef areas around Taiwan, but usually rare.

Distribution

Widely distributed throughout west Indian Ocean and the Pacific, from Red Sea to Solomon Islands and Fiji.

Remarks

This species has close resemblance to *Blastomussa wellsi*, but the former is easily distinguished by its smaller corallites.



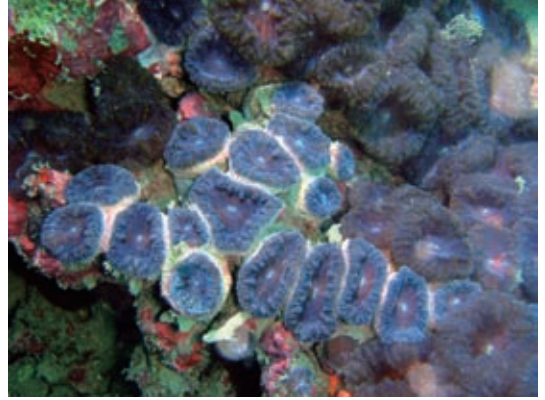
A colony of *Blastomussa merleti*.



A close view of the corallites.

Blastomussa wellsi Wijsman-Best, 1973

Chinese Name 大棘菊珊瑚
Family Plesiatreidae
Publication *Blastomussa wellsi* Wijsman-Best, 1973
Synonymy *Blastomussa wellsi* Wijsman-Best; Chevalier (1975); Veron & Pichon (1980); Veron (1986), Nishihira & Veron (1995); Veron (2000)



A colony of *Blastomussa wellsi*.

Taxonomic description and diagnosis

Colonies are phaceloid to subplocoid and monocentric. Corallites are 9-14 mm in diameter, with the space in between corallites being covered by expanded mantle which often form a continuous surface obscuring the skeletal structure underneath. Septa are not arranged in orders. Most are evenly exsert with decreasing thickness towards calice center and reach the columella. Septa are dentate with small, blunt teeth which also decrease in size towards the calice center. Minor septa are interspersed between the major ones only at the periphery of the corallites. Columella is weakly developed.

Mantles may be dark red, grey or green, usually with green, red or grey oral discs.

Ecology

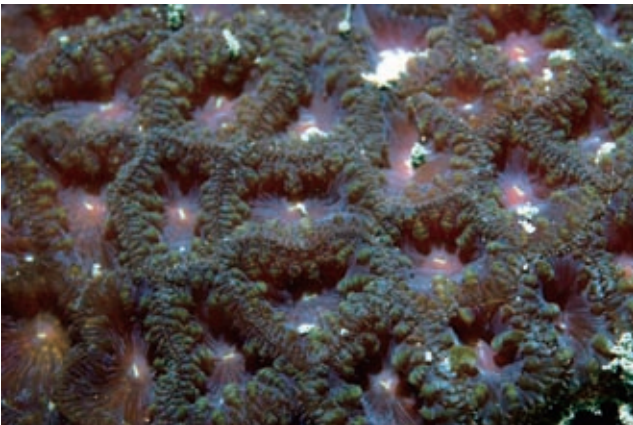
Found on upperprotected reef slopes in turbid environments.

Occurrence

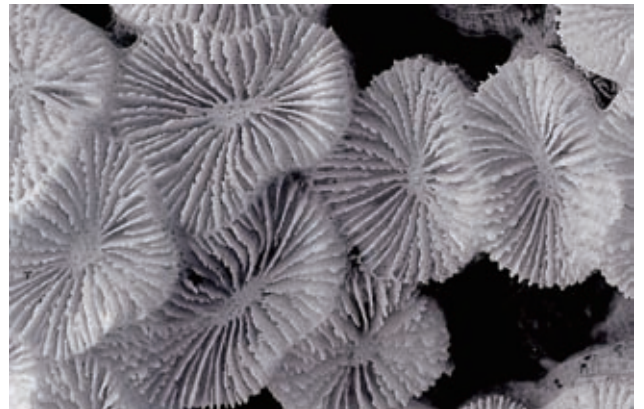
All reef areas around Taiwan and offshore islets, but usually rare.

Distribution

Widely distributed throughout the Pacific, from the Indonesian Archipelago to Samoa. Also recorded from the Red Sea.



A close view shows expanded mantle covering corallites.



Skeleton of *Blastomussa wellsi*.

Physogyra lichtensteini (Edwards & Haime, 1851)

Chinese Name	輕巧泡紋珊瑚
Family	Plesiatreidae
Publication	<i>Plerogyra lichtensteini</i> Edwards & Haime (1851)
Synonymy	<i>Physogyra lichtensteini</i> (Edwards & Haime); Matthai (1928); Yabe et al. (1936); Wells (1954); Ma (1959); Chevalier (1971); Veron & Pichon (1980); Veron (1986); Nishihira & Veron (1995); Veron (2000)



A colony of *Physogyra lichtensteini*.

Taxonomic Description & Diagnosis

Colonies are massive or flat, thick plates, frequently over 1 m across and more than 30 cm in thickness. They are meandroid with long and sinuous or very short valleys, or a mixture of both. Septa are not arranged in orders. Septa are thin, delicate, with smooth margins, and may be up to 8 mm exsert and 18 mm wide, with the exception of some that are up to 3 mm thick near their base. Septa extend to the valley center where they plunge vertically, and may curve, split or fold to form simple axial elements.

During the day, pale grey or dull green vesicles that are grape-like or bifurcated in shape, cover the whole colony. At night, elongate, tapering tentacles up to 3 cm in length are expanded and cover the vesicles.

Ecology

Commonly found in protected habitats, especially in turbid reef environments.

Occurrence

Nanwan Bay in Kenting National Park, Ludao and Dongsha Atoll, but very rare.

Distribution

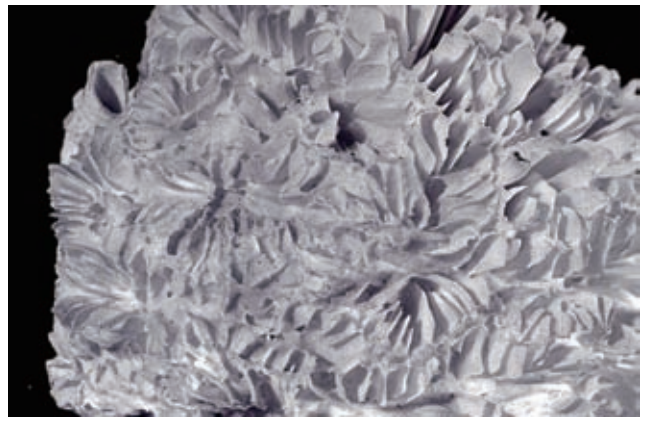
Widely distributed throughout the Indo-Pacific, from the Red Sea and east Africa, to Okinawa, the Great Barrier Reefs and the Polynesia.

Remarks

This species is similar to *Plerogyra sinuosa*, but the former is distinguished by having smaller vesicles that are more readily retractable.



A close view shows vesicles covering the corallites.



A close view of skeleton showing delicate septa.

Plerogyra sinuosa (Dana, 1846)

Chinese Name 卷曲氣泡珊瑚

Family Plesiatreidae

Genus *Plerogyra*

Publication *Euphyllia sinuosa* Dana (1846)

Synonymy *Plerogyra sinuosa* (Dana); Matthai (1928); Yabe et al. (1936); Ma (1959); Chevalier (1971); Scheer & Pillai (1974); Veron & Pichon (1980); Veron (1986); Nishihira & Veron (1995); Veron (2000)

Taxonomic Description & Diagnosis

Colonies are shaped like an inverted cone, which may be larger than 1 m across. They are initially monocentric and trochoid when small and less than 30 cm long. As the size gets larger, colonies become flabelloid, then flabello-meandroid, and the meandering valleys are usually separated into independent phaceloflabellate branches. Septa are very irregular, with adjacent septa often having differing shapes that result in a ragged colony appearance. Septa are usually arranged in four indistinct orders, and may be up to 2.5 mm thick, 35 mm broad, and 20 mm exsert. Septal margins are entire and smooth, septal sides are also smooth or only weakly granulated.

Living colonies are covered with large, grey vesicles which are less readily retractable and < 2.5 cm in diameter. The vesicles cover the large septa during the day, but are in turn covered by tentacles during the night.

Ecology

Usually found in protected reef biotopes, especially in lagoons or lower reef slopes.

Occurrence

Nanwan Bay in Kenting National Park, Ludao, and Dongsha Atoll.

Distribution

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

Remarks

Costae of small colonies are frequently lobed, with the lobes sometimes forming spines, which may become elongate and develop into minute polyps. This budding method is only found in *Plerogyra* and *Euphyllia*.



A colony of *Plerogyra sinuosa* with extending vesicles.



A close view of coralites with retracted vesicles.

Agathiphylliidae Vaughan and Wells, 1943

Vaughan and Wells (1943) established this family based on the existence of compound trabeculae and the presence of a synapticulotheca in early stages of mural development. This family is a small group of Cenozoic reef corals consisting of four fossil genera and one existing genus *Diploastrea*. They pointed out that *Diploastrea* is homomorphic with faviid genera. Then, Wells (1956) included *Dilpoastrea* as a genus of Faviidae and this treatment has been widely accepted by most subsequent studies on reef corals. However, recent molecular phylogenetic analyses clearly showed that *Dilpoastrea* is an unique clade within the robust group (Fukami et al. 2008). Therefore, we suggest to resume this family.

Diploastrea is the only existing genus of this family and *D. heliopora* is the only valid species of this genus. It often forms large plocoid colonies by extratentacular budding. The corallite walls are mostly septothecate, but partially synapticulothecate and porous near calice. Septa are thick peripherally and thin internally. Septa are formed by compound trabeculae and often have large dentations. Columella is well developed and composed of twisted trabecular processes.



A large colony of *Diploastrea heliopora* (Ludao).

Diploastrea heliopora (Lamarck, 1816)

Chinese Name 圓雙星珊瑚
Family Agathiphylliidae
Publication *Astraea heliopora* Lamarck (1816)
Synonymy *Astraea heliopora* (Lamarck); Vaughan (1917, 1918); Eguchi (1935, 1938); Yabe et al. (1936); Crossland (1952); Wells (1954); Nemenzo (1962); Chevalier (1968); Scheer & Pillai (1974); Veron et al. (1977); Veron (1986); Nishihira and Veron (1995); Veron (2000)



A colony of *Diploastrea heliopora*.

Taxonomic description and diagnosis

This is one of the few species that is immediately recognizable and least variable of all massive corals. Colonies are massive, usually dome-shaped with an even surface, which may be up to 2 m high and 7 m in diameter. They are characteristically symmetrical in shape, with dense and very hard skeletons. Corallites are plocoid, cone-like, with very thick walls and small openings. Septa are equal, thick at the periphery of the corallites and thin where they adjoin the columella. Septa have large dentations, which may be more or less prominent in different colonies. Columella is large and well developed.

Living colonies are usually uniform pale cream or grey, sometimes greenish.

Ecology

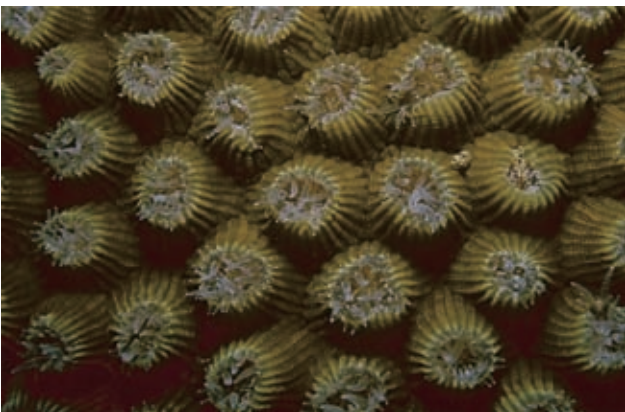
Found in most coral reef environments, but large colonies are usually restricted to protected or semi-protected biotopes. Budding is extratentacular. Tentacles are only extended at night.

Occurrence

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

Distribution

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



A close view of corallites with extended tentacles.



A close view of corallites skeleton.

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