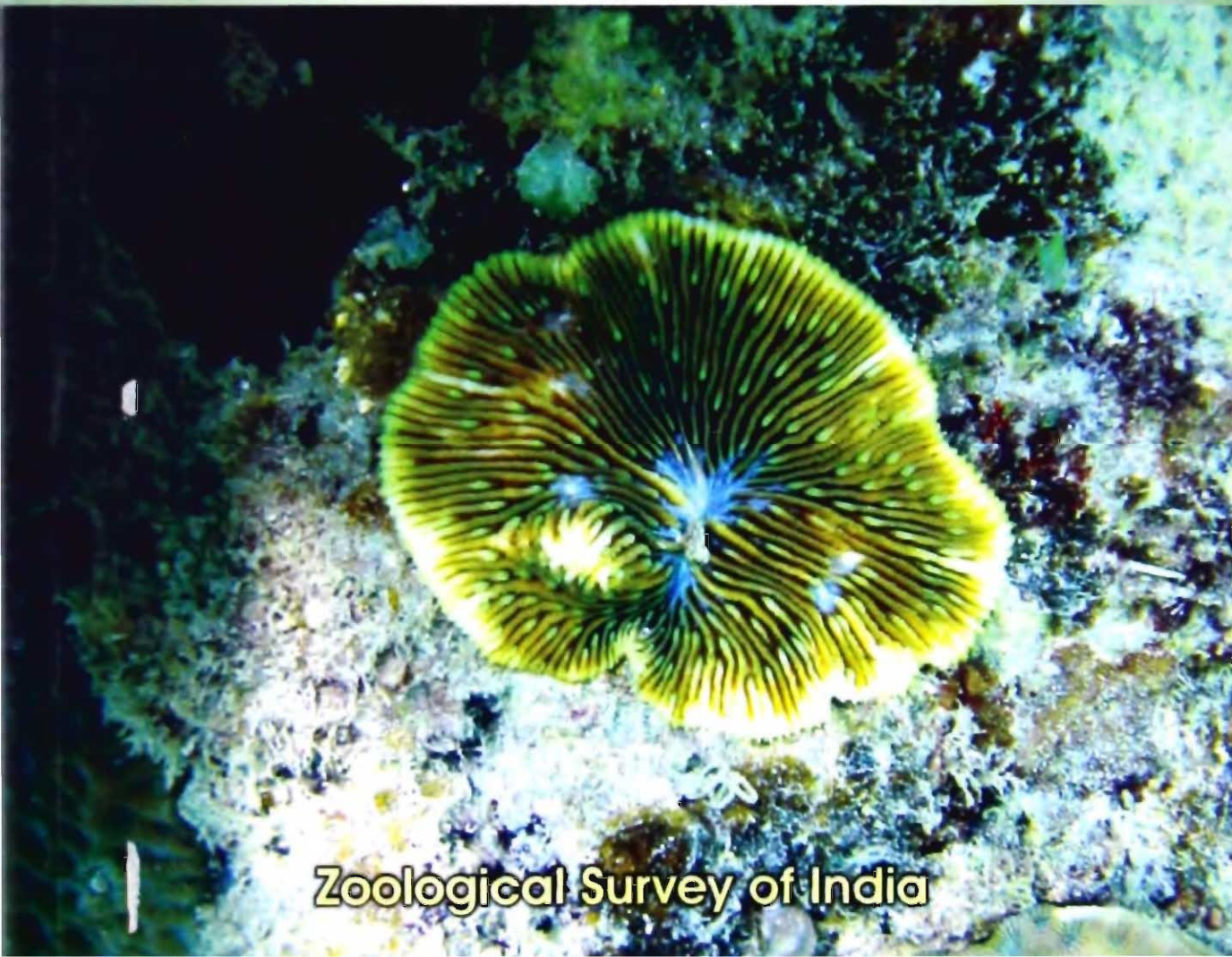




Guide to
Fungiids
of Andaman and Nicobar Islands

RAMAKRISHNA
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TAMAL MONDAL
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Zoological Survey of India

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INTRODUCTION

The coral reef is an entire living system, a structure built by colonies of tiny coral animals over millions of years. Teeming with as much biodiversity as terrestrial rainforests, coral reefs with their extraordinary beauty, bright palette of colors, and oddly patterned inhabitants are one of Earth's most important ecosystems. The biodiversity of the reef system supports a vast interdependent food web, from microscopic plants and animals to humen. However, this life sustaining resource is now seriously threatened by human impact. The possible warming of our climate with associated warming of ocean temperatures, increased sedimentation from development along coastal areas, pollution, and unsustainable fishing methods are only some of the threats to reefs worldwide. As humans change the environment on the surface of the Earth, the conditions underneath the surface of our oceans change accordingly. Through scientific exploration and discovery at Scripps Institution of Oceanography and other research institutions worldwide, we are learning how the coral reef ecosystem is dependent on the complex interactions of its inhabitants. From the microscopic plants that live within the tissues of the corals to the diversity of invertebrates and fishes that find food and shelter within the colorful caves and crevices, the reef system's millions of species also provide important food resources for sharks, sea turtles and dolphins. Millions of people throughout the world depend directly on the reefs for their livelihood. There are more species of organisms living on coral reefs than in any other environment in the ocean. In fact, despite covering less than 0.2 percent of the total area of oceans, coral reefs are noted for some of the highest levels of total productivity on Earth and house 25% of all marine creatures. Like a rainforest, coral reefs form a habitat where an astonishing array of life thrives. It has been estimated that between 1-9 million species live on coral reefs. Reefs are home to thousands of species found nowhere else on Earth. For many it is a hunting ground, a safe place to hide, a place to breed, to raise young, and to grow old. There is a complex and delicate web of close relationships between the many organisms in the coral reef ecosystem. Coral reefs are dynamic systems, producing lime stones at the rate of 400-2000 tones per hectare per year (Chave *et al.*, 1972). Coral reefs influence the chemical balance of world's oceans (Smith, 1978).

The phylum Cnidaria is a diverse group of relatively simple animals united by the ability to synthesize a highly complex cellular product, the cnida. Its members, which include corals, hydroids, jellyfishes, sea

anemones, and sea fans, are abundant and common in marine environments, and have been known to natural historians for millennia. Linnaeus (1758) included representatives of all major cnidarian lineages in *Systema Naturae* in various orders of *Vermes Imperfecta*. His taxonomic placement of cnidarian species was based largely on whether they were solitary or colonial, and whether they had no skeleton, a stony skeleton, or a proteinaceous skeleton. Cnidaria comprises two reciprocally monophyletic clades. The distinction between Anthozoa and Medusozoa is well-supported by anatomy and life history (Salvini-Plawen 1978; Bridge *et al.* 1995).

The class Anthozoa comprises two reciprocally monophyletic lineages, Octocorallia and Hexacorallia. All members of Anthozoa are exclusively polypoid, and may be colonial, clonal, or solitary, skeletonless or with a mineralic and/or proteinaceous skeleton. Anthozoa currently contains approximately 7,500 extant species. The anthozoan subclass Hexacorallia comprises all scleractinian and black corals, tube anemones, and sea anemones in the broadest sense (i.e., orders Actiniaria, Antipatharia, Ceriantharia, Corallimorpharia, Scleractinia, and Zoanthidea). Hexacorallia currently contains about 4,300 extant species (Doumenc and van Praët 1987). The Scleractinia Bourne, 1900 are polyp animals found exclusively in marine habitats. Its members are referred to as stony corals because all members of the order bear a solid calcareous skeleton that is external to the soft tissues, secreted by epidermal cells at the base of polyps to form cup-like calyces subdivided by septa and into which the polyp can retract for protection. Within the Anthozoa, such a skeleton is unique to the order. Approximately 1,300 described extant species (Cairns, 1999) are divided ecologically into two main groups. One group, the reef builders, comprises 656 species. These are perhaps the best known scleractinian corals and are found mostly in the clear, shallow waters of the tropics. The second group, composed of 669 species, does not build reefs and is found in all regions of the oceans, including temperate and Polar Regions, and from relatively shallow waters to 6,000 m. The oldest scleractinian coral fossils are from the mid-Triassic (about 240 million years ago) and are similar to the scleractinians of today.

Fungiidae Dana, 1846 comprises 15 genera with approximately 56 nominal species, all of which are zooxanthellate. It is considered monophyletic based on phylogenetic analysis of morphological data and limited molecular data (Cairns, 1984; Hoeksema, 1989; Romano and Cairns, 2000; Veron, 2000; Kerr, 2005; Le Goff-Virty, 2004).

Corals of the family Fungiidae are all solitary species most commonly found on the surface substrates of reefs and lagoons. Most Fungiids are found in shallow water (under ten meters in depth) on various types of substrates; rocky, sandy, and silty. Ones with a high relief (dome-shaped) and spines/septa of low relief utilize these aspects of their morphology, expansion of their polyp-bodies, and/or muco-ciliary action. The members of the family show positive phototaxis movement. The more flat-profile, un-toothed septa species that are more often offered to the hobby don't have as much Latitude at throwing off sediment and should be placed accordingly on softer, low-detritus bottoms out of the way of direct current. Unlike most other hard corals which are colonies of small polyps, most mushroom corals are a single giant polyp. Some species have a circular disk-like skeleton, others are long and tongue-like. Most have short tentacles, except for the white-tipped mushroom coral (*Heliofungia actiniformis*) that has such long tentacles that they are often mistaken for sea anemones. Mushroom corals have variable colours, often the mouth is the most strikingly coloured. In some, the tissue around the mouth is banded. Their tentacles are often extended in daytime. According to Veron (2000), the violet or bright pink patches seen on some mushroom hard corals are due to damage and injury. A young mushroom coral starts life attached to a surface, and looks like a tiny stalked mushroom. In many species, as the coral matures eventually breaks away from the stalk and lives life as an adult unattached to the bottom. In some, the older coral remains attached and the stalk is obscured by the growing disk. Free-living mushroom corals can move, though very slowly. While smaller ones may be able to right themselves should they be accidentally overturned, bigger ones will die if this happens to them. Though these mobile scleractinians don't sting each other, other sessile invertebrates must be placed, arranged out of harm's way, including climbing harm's way. Most other corals will suffer given contact with a Fungiid skeleton, polyp or its mucus. Fungiids bear endosymbiotic algae that require strong light, but all benefit from regular feeding as well. Foods may be placed on their upper surfaces or a mash of appropriate size matter can be basted in their direction with the filter pumps temporarily cycled off. Almost all mushroom corals harbour microscopic, single-celled symbiotic algae (zooxanthellae) within their bodies. The algae undergo photosynthesis to produce food from sunlight. The food produced is shared with the host, which in return provides the algae with shelter and minerals. It is believed this additional source of nutrients from the zooxanthellae help hard corals produce their hard skeletons and thus expand their size faster. Reproduction can be sexual but is often encountered in the form

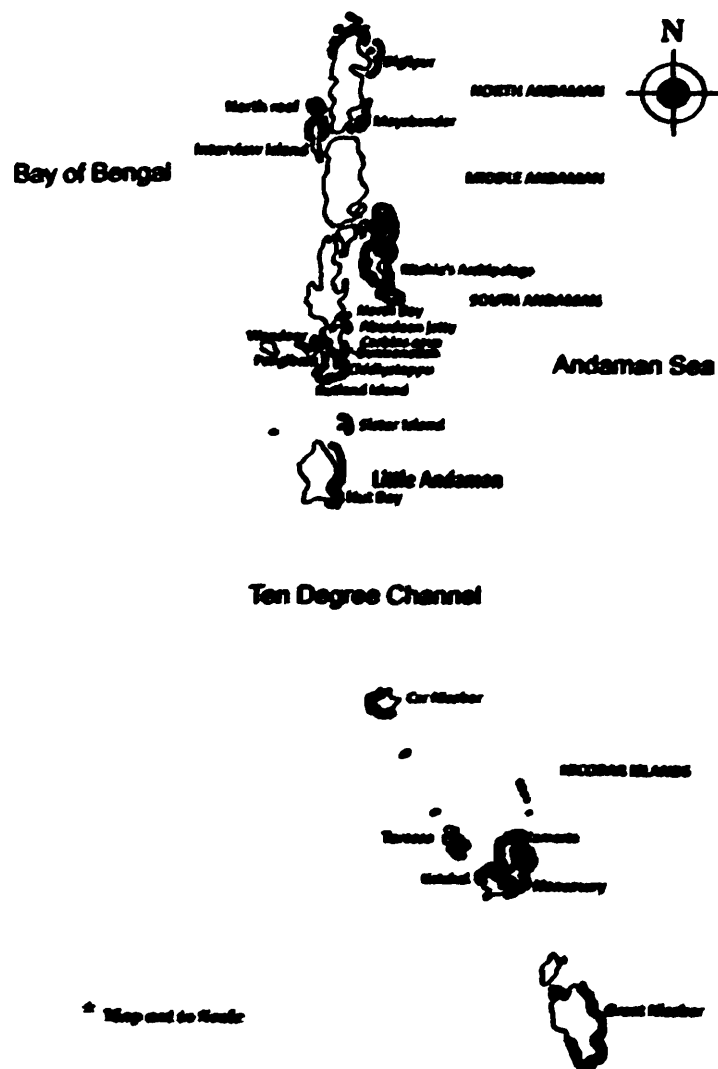
of asexually produced daughter colonies, called anthocauli. These asexual bits grow and break off a parent, making their lives on the bottom separately. Fragmentation is another way Fungiids may be reproduced. This requires at most the breaking of a donor into six pieces.

A total of 56 species are recorded throughout the world (Veron, 2000). Among those, 22 species were recorded previously from Indian water (Venkataraman, 2003).

Recent studies on this field revealed out 44 species are recorded from Andaman and Nicobar Islands.

STUDY AREA

The Andaman and Nicobar group of Islands is located in the southeast of Bay of Bengal, between 6°-14° N Latitude and 91°-94° E Longitude. They are the part of the mountain chain and lie on a ridge that extends southward from Irrawaddy delta of Burma, containing the trend of the Arakan Yoma range (Venkataraman, 2003). There are 572 islands in the chain, some of which are volcanic. The islands occupy an area of 8293 km² with a coastline of 1962 km and account for 30% of the Indian Exclusive Zone. There are 106 protected areas in these islands, 96 designated as wildlife sanctuaries, 9 national parks and one biosphere reserve. Among 9 national parks, 2 are marine national parks which have not yet inventoried thoroughly. The coral reefs of Andaman and Nicobar Islands are the biodiversity hot spot of India (Jeyabaskaran, 1999). The names of the study areas are cited below with Global Positioning System (GPS) coordinates.





Andaman and Nicobar Islands

Sl. No.	Area surveyed	GPS	Coordinates
SOUTH ANDAMAN			
1.	Off Burmanella	Lat. 11°33. 468'N	Long. 92° 43.873'E
2.	Off Rangachang	Lat. 11° 34. 350'N	Long. 92° 44.133'E
3.	Chidyatapu	Lat. 11° 29. 460'N	Long. 92° 42.530'E
4.	Pongibalu	Lat. 11° 31. 030'N	Long. 92° 39.159'E
Rutland Island			
5.	Chain Nalah	Lat. 12° 08. 522'N	Long. 93° 06.551'E
6.	Padauk Dikri	Lat. 12° 29. 288'N	Long. 92° 40.141'E
7.	Surumai Dikri	Lat. 11° 25. 504'N	Long. 92° 40.301'E
8.	Komeo	Lat. 11° 24. 314'N	Long. 92° 39.780'E
9.	Mitta Nalah	Lat. 11° 28. 541'N	Long. 92° 40.371'E
10.	Arom Point	Lat. 11° 30. 541'N	Long. 92° 38.769'E
11.	Aam Dera	Lat. 11° 24. 664'N	Long. 92° 37.456'E
12.	North Wandoor	Lat. 11° 37. 270'N	Long. 92° 37.035'E
13.	Grub Island	Lat. 11° 35. 391'N	Long. 92° 35.637'E
14.	Jolly Buoy Island	Lat. 11° 30. 251'N	Long. 92° 32.591'E
15.	Tarmugli Island	Lat. 11° 33. 261'N	Long. 92° 36.809'E
16.	North Bay	Lat. 11° 42. 068'N	Long. 92° 45.116'E
17.	Off Collinpur	Lat. 11° 41. 598'N	Long. 92° 37.035'E
18.	Off Kurmadera	Lat. 11° 39. 933'N	Long. 92° 35.903'E
Ritchie's Archipelago			
19.	Havelock Island	Lat. 12° 00. 005'N	Long. 92° 56.808'E
20.	Inglis Island	Lat. 12° 08. 639'N	Long. 93° 06.786'E
21.	Henry Lawrence Island	Lat. 12° 05. 000'N	Long. 93° 06.312'E
22.	John Lawrence Island	Lat. 12° 04. 075'N	Long. 93° 00.398'E
23.	Outram Island	Lat. 12° 00. 574'N	Long. 92° 56.808'E
24.	Sir William Peel Island	Lat. 12° 03. 315'N	Long. 92° 59.929'E
25.	Nicolson Island	Lat. 12 ° 06.739'N	Long. 92 ° 57.235'E
26.	South Button Island	Lat. 12° 13. 467'N	Long. 92° 01.334'E
27.	North Button Island	Lat. 12° 18. 974'N	Long. 92° 03.826'E
28.	Middle Button Island	Lat. 12° 16. 473'N	Long. 93° 01.334'E
29.	Wilson Island	Lat. 12° 13. 061'N	Long. 93° 15.207'E

Sl. No.	Area surveyed	GPS Coordinates
Neill Island		
30.	Lakshmanpur	Lat. 11° 50. 826'N Long. 93° 00.554'E
31.	Hawrah Bridge	Lat. 11° 49. 727'N Long. 93° 00.818'E
32.	Middle Point	Lat. 11° 50. 857'N Long. 93° 00.554'E
33.	Ramangar	Lat. 11° 48. 400'N Long. 93° 01.440'E
34.	Sunset point	Lat. 11° 51. 941'N Long. 93° 00.667'E
35.	Little Neil Island	Lat. 11° 47. 063'N Long. 93° 04.616'E
36.	Pearl Park Beach	Lat. 11° 50. 766'N Long. 93° 00.795'E
Little Andaman Island		
37.	Butler Bay	Lat. 10° 40. 232'N Long. 92° 56.808'E
38.	Kala Pathar	Lat. 10° 39. 558'N Long. 92° 34.109'E
39.	Haminder Bay	Lat. 10° 32. 975'N Long. 92° 32.651'E
40.	Off Ramkrishnapur	Lat. 10° 42. 630'N Long. 92° 33.066'E
41.	Sister Island	Lat. 10° 55. 830'N Long. 92° 07.023'E
42.	Hut Bay	Lat. 10° 35. 419'N Long. 92° 33.066'E
43.	Dugong Creek	Lat. 10° 48. 385'N Long. 92° 64.000'E
44.	Off Light House	Lat. 10° 30. 734'N Long. 92° 30.264'E
Middle Andaman		
45.	North Reef Island	Lat. 12° 56. 084'N Long. 92° 57.345'E
46.	Interview Island	Lat. 12° 59. 125'N Long. 92° 42.981'E
47.	Avis Island	Lat. 12° 56. 210'N Long. 92° 33.066'E
48.	Sound Island	Lat. 12° 56. 084'N Long. 92° 57.345'E
49.	Rail Island	Lat. 12° 56. 860'N Long. 92° 54.620'E
50.	Karlo Island	Lat. 12° 56. 084'N Long. 92° 53.378'E
51.	Karmatang	Lat. 12° 51. 322'N Long. 92° 56.050'E
North Andaman		
52.	Ross Island	Lat. 13° 18. 167'N Long. 93° 04.261'E
53.	Smith Island	Lat. 13° 18. 406'N Long. 93° 04.207'E
54.	Ariel Bay	Lat. 13° 16. 093'N Long. 93° 02.433'E
55.	Lamia Bay	Lat. 13° 24. 879'N Long. 93° 05.516'E
Nicobar IslandsCar Nicobar Island		
56.	Malacca	Lat. 09° 10. 490'N Long. 92° 49.714'E
57.	Kakaana	Lat. 09° 07. 750'N Long. 92° 48.678'E
58.	Tamoloo	Lat. 09° 11. 350'N Long. 92° 49.498'E

Sl. No.	Area surveyed	GPS Coordinates
59.	Kimos	Lat. 09° 07. 587'N Long. 92° 46.316'E
60.	Perka	Lat. 09° 11. 203'N Long. 92° 49.877'E
61.	Lapati	Lat. 09° 13. 978'N Long. 92° 48.002'E
Nancowry Islands		
62.	Kamorta Island Bada Enaka	Lat. 12° 51. 322'N Long. 92° 56.050'E
63.	Champin Island	Lat. 08° 01. 670'N Long. 93° 33.123'E
64.	Trinket Island	Lat. 08° 02. 806'N Long. 93° 34.556'E
65.	Kamorta Island - Kardip	Lat. 08° 02. 151'N Long. 93° 33.182'E
66.	Kamorta Island - Kakkana	Lat. 08° 07. 170'N Long. 93° 31.606'E
67.	Munak Island	Lat. 07° 59. 813'N Long. 93° 30.534'E
68.	Katchal Island	Lat. 07° 58.952'N Long. 93°24.351'E
69.	Teressa Island	Lat. 08° 13.686'N Long. 93°10.913'E
70.	Kundol Island	Lat. 07° 10. 023'N Long. 93° 42.949'E
Great Nicobar Island		
71.	Campbell Bay	Lat. 06° 59. 749'N Long. 93° 56.718'E
72.	Off Laxman Beach	Lat. 07° 01. 482'N Long. 92° 37.456'E
73.	Off Gandhi Nagar	Lat. 06° 50. 496'N Long. 93° 53.680'E
74.	Joginder Nagar	Lat. 06° 57. 226'N Long. 93° 55.495'E
75.	Singam Basti	Lat. 06° 58. 307'N Long. 93° 55.748'E
76.	Navy Dera	Lat. 07° 07. 571'N Long. 93° 53.133'E
77.	Indira Point	Lat. 06° 45. 428'N Long. 93° 49.541'E
78.	Kopen Heat	Lat. 06° 50. 923'N Long. 93° 47.983'E



Mahatma Gandhi Marine National Park



South Button Island



Little Andaman Island



Butler Bay Little Andaman Island

MATERIAL AND METHODS

Several surveys were conducted during the period of April, 2009 to March, 2010 at different sites of Andaman and Nicobar Islands to assess the diversity of Fungiids. Studies were made by employing Self-Contained Underwater Breathing Apparatus (SCUBA) diving and snorkeling. Line intercept transect (Bradbury and Reichelt *et.al.*, 1986), Quadrata methods (Endean and Stablum, 1973), Photoquadrata and underwater video transect method was applied to investigate the diversity and distribution of these corals. During SCUBA diving, species recording was made by underwater digital photography (Sony - Cyber shot, Model-T900, marine pack, 12 megapixels) for detailed identification. Identification was done depending on the photographs in conjunction with Veron (2000), Wallace (1999) and (Sheppard, 1987).



Quadrata Study of Fungiids



A diver monitoring on the reef



Underwater Photography



CLASSIFICATION OF FUNGIIDAE

Kingdom ANIMALIA

Phylum CNIDARIA Hatschek, 1888

Class ANTHOZOA Ehrenberg, 1834

Order SCLERACTINIA Bourne, 1900

Suborder FUNGIINA Verrill, 1865

Family FUNGIIDAE Dana, 1846

Genus *Cantharellus* Höksema and Best, 1984

Genus *Ctenactis* Agassiz in Verrill, 1864

Genus *Cycloseris* Milne-Edwards and Haime, 1849

Genus *Diaseris* Milne-Edwards and Haime, 1849

Genus *Fungia* Lamarck, 1801

Genus *Halomitra* Dana, 1846

Genus *Heliofungia* Wells, 1966

Genus *Herpetoglossa* Wells, 1966

Genus *Herpolitha* Eschscholtz, 1825

Genus *Lithophyllon* Rehberg, 1892

Genus *Parahalomitra* Wells, 1937

Genus *Podabacia* Milne-Edwards and Haime, 1849

Genus *Polyphyllia* Quoy and Gaimard in Blainville, 1830

Genus *Sandalolitha* Quelch, 1884

Genus *Zoopilus* Dana, 1846

Family FUNGIIDAE Dana, 1846

Taxonomic references

- Wells, J.W. 1966a. Evolutionary development of the scleractinian family Fungiidae. In : Rees, W.J. (ed) The Cnidaria and their evolution. *Symp. Zool. Soc. London*, **16** : 223-246.
- Veron, J.E.N. and Pichon, M. 1980. Scleractinia of Eastern Australia. Part 3, Families Agariciidae, Siderasteridae, Fungiidae, Oculinidae, Merulinidae, Mussidae, Pectiniidae, Caryophylliidae, Dendrophylliidae. *Australian Inst. Mar. Sci. Monogr. Ser.*, **IV** : 1- 471
- Hoekesma, B.W. 1989. Systematics and ecology of mushroom corals (Scleractinia : Fungiidae). *Zool Verhandelingen*, **254** : 1-471

Description : Solitary or colonial, free living or attached, mostly zooxanthalate. Colonial genera may be derived from solitary genera as each colonial genus has septo-costal structures corresponding to those of a solitary genus. These septo-costae radiate from the mouth on the upper surface (as septa) and from the centre of the undersurface (as costae).

Representatives of Family Fungiidae

Key Characters for FUNGIIDAE

- Not colonial, free living, central mouth dominant, disc small, costae inconspicuous. Disc entire Genus *Cycloseris*
- Disc approximately circular, disc strongly arched, central arch not distinctive, Septa straight, symmetrical *C. cyclolites*
- Septa curved, not symmetrical *C. curvata*
- Central arch distinctive, Septa even within orders *C. costulata*
- Septa uneven *C. erosa*
- Disc generally flat, Septa not exsert around the mouth, Primary septa form radiating spokes *C. hexagonalis*
- Septa do not form radiating spokes *C. sinensis*
- Septa exsert around the mouth, Costae thin and even, Septo-costae alternate at the disc margin *C. vaughani*
- Septo-costae do not alternate *C. patelliformis*
- Costae thick and irregular *C. tenuis*
- Disc very thin and flat *C. colini*
- Disc elliptical *C. somervillei*
- Disc partitioned into segments Genus *Diaseris*
- Septa thin and uniform *D. fragilis*
- Septa thick and wavy *D. distorta*
- Disc not small, costae conspicuous, Septal teeth not large lobes ...
..... Genus *Fungia*
- Disc approximately circular, Septal teeth large and pointed, Disc mostly flat *F. scruposa*

- Disc not flat, Whole of upper surface arched, Septal teeth irregular
 *F. corona*
- Septal teeth uniform *F. klunzingeri*
- Central arch distinctive, Disc thick and weavy *F. horrida*
- Disc not thick *F. danai*
- Septal teeth saw-like with a central rib *F. fungites*
- Septal teeth fine, rounded, Septa thick and weavy *F. granulosa*
- Septa not thick and weavy, Septal cycles even, Surface with axial
 mouth only, Septal teeth distinct *F. repanda*
- Septal teeth fine serrations *F. scabra*
- Surface with peripheral mouths *F. puishani*
- Septa cycles uneven, Septa in two distinct orders, Central arch
 present *F. spinifer*
- Central arch absent *F. concinna*
- Disc not distinctively circular, Disc irregularly shaped, Surface with
 peripheral mouths *F. taiwanensis*
- Surface with out peripheral mouths *F. moluccensis*
- Disc with a regular shape, Tentacular lobes conspicuous
 *F. scutaria*
- Tentacular lobes inconspicuous or absent, Septa thick
 *F. paumotensis*
- Septa fine *F. seychellensis*
- Septal teeth large lobes Genus *Heliofungia*
- Axial furrow dominant Genus *Ctenactis*
- Axial mouth with single mouth, Tentacles with white tips
 *C. albitentaculata*
- Tentacles without white tips *C. echinana*
- Axial furrow with multiple mouths *C. crassa*
- Attached to substrate Genus *Cantharellus*
- Septa thin *C. noumeae*
- Septa thick, Disc button-like *C. doederleini*

- Disc irregular, encrusting *C. jebbi*
- Colonial, Colony free living, Axial furrow distinct
 Genus *Herpolitha*
- Centres mostly restricted to axial furrow *H. weberi*
- Centres numerous outside axial furrow *H. limax*
- Axial furrow indistinct or absent, Septo-costae petaloid
 Genus *Polyphyllia*
- Septa grouped into parallel blocks *P. novachiberniae*
- Septa radiate *P. talpina*
- Septa not petaloid, Corallites robust or crowded
 Genus *Sandalolitha*
- Colony strongly arched *S. robusta*
- Colony irregularly flat, Corallites evenly distributed
 *S. africana*
- Corallites restricted to central *S. dentata*
- Corallites not robust or crowded, Colonies delicate domes
 Genus *Zoopilus*, *Z. echinatus*
- Colonies not delicate domes Genus *Halomitra*
- Septal teeth smooth *H. pileus*
- Septal teeth ornamented *H. meierae*
- Septal teeth club shaped *H. clavator*
- Colony attached to substrate, Colony mostly encrusting
 Genus *Lithophyllon*
- Central corallite distinguishable, Septo-costae thick, colony small
 *L. mokai*
- Septo-costae not thick, colony not small *L. lobata*
- Central corallite not distinguishable *L. undulatum*
- Colony mostly explanate Genus *Podabcia*
- Colony irregularly contorted *P. lankaensis*
- Colony not contorted, Colony with lobed margins
 *P. sinai*

- Colony with entire margins, Peripheral corallites strongly inclined
 *P. crustacea*
- Peripheral corallites not inclined *P. motuporensis*

Genus *Cycloseris* Milne Edwards and Haime, 1849

Taxonomic references

- Wells, J.W. 1966. Evolutionary development of the scleractinian family Fungiidae. In : Rees, W.J. (ed) The Cnidaria and their evolution. *Symp. Zool. Soc. London*, **16** : 223-246.
- Veron, J.E.N. and Pichon, M. 1980. Scleractinia of Eastern Australia. Part 3, Families Agariciidae, Siderasteridae, Fungiidae, Oculinidae, Merulinidae, Mussidae, Pectiniidae, Caryophylliidae, Dendrophylliidae. *Australian Inst. Mar. Sci. Monogr. Ser.*, **IV** : 1-471.
- Veron, J.E.N. 2000. Corals of the World. 3 vols. *Australian Institute of Marine Science and CRR Qld. Pty. Ltd.*

Description : Corals are solitary, free-living, flat or dome shaped, and circular or slightly oval in outline, with a central mouth. Septa have fine teeth and costae are also fine. There are no pits on the surface. Usually restricted to non reef environments. Tentacles are usually extended only at night.

Similar genus *Cycloseris* is close to *Fungia* and resembles *Diaseris*. *Fungia* grows much longer than *Cycloseris*, may be elongate, may have septa with larger teeth, and may have costae with elongate spines.

1. *Cycloseris cyclolites* (Lamarck, 1801), Fig. 1

Synonyms

- Fungia glans* Dana, 1846.
- Fungia adrianae* van der Horst, 1921.
- Fungia cyclolites* Lamarck, 1816.

Taxonomic references

- Lamarck, J.B.P.A. de Monet de. 1816. *Histoire naturelle des animaux sans vertèbres*, **2**. Verdière. -Paris.
- Veron, J.E.N. and Pichon, M. 1980. Scleractinia of Eastern Australia. Part 3, Families Agariciidae, Siderasteridae, Fungiidae, Oculinidae, Merulinidae, Mussidae, Pectiniidae, Caryophylliidae, Dendrophylliidae. *Australian Inst. Mar. Sci. Monogr. Ser.*, **IV** : 1-471.

Hoekesma, B.W. 1989. Systematics and ecology of mushroom corals (Scleractinia : Fungiidae). *Zool. Verhandelingen*, **254** : 1-471.

Cairns, S. D., Hoeksema, B.W. and van der Land, J. 1999. List of extant stony corals. Appendix (pp. 13-46) in S.D. Cairns, Species richness of Recent Scleractinia. *Atoll Research Bulletin*, **459** : 1-46.

Veron, J.E.N. 2000. Corals of the world. 3 vols. *Australian Institute of Marine Science and CRR Qld. Pty. Ltd.*

Description : Polyps are circular or slightly oval domes up to 40 millimetres wide with a concave undersurface. Septa are straight and symmetrical. Primary septa are thick and exert around the mouth.

Colour : Pale cream or greenish, often with margins to major septa. Some times brightly coloured in shallow water.

Similar species : *Cycloseris curvata*

Occurrence : Common



Fig. 1. *Cycloseris cyclolites* (Lamarck, 1801)

Material Examined Seven materials were examined. The smallest one showed 2.3 cm in diameter and the largest one was 3.8 cm.

Distribution India : Andaman and Nicobar Islands (Aves, Rutland and North Reef Islands), Gulf of Mannar and Palk Bay.

Elsewhere Australia, Djibouti, Egypt, Fiji, Guam, India, Indonesia, Japan, Madagascar, Malaysia, Maldives, Mauritius, Mozambique, Myanmar, New Caledonia, Papua New Guinea, Philippines, Réunion, Seychelles, Singapore, Solomon Islands, Somalia, South Africa, Sri Lanka, Sudan, Taiwan, Province of China, Thailand, United Republic of Tanzania, United States of America and Viet Nam.

IUCN Red list Category and Criteria : Least Concern.

2. *Cycloseris sinensis* Milne Edwards and Haime, 1851,
Fig. 2

Synonyms

Cycloseris mycoides Alcock, 1893.

Fungia sinensis (Milne Edwards and Haime, 1851).

Diaseris freycineti Milne Edwards and Haime, 1851.

Taxonomic references

Milne Edwards, H. and Haime, J. 1851. Recherches sur les Polypiers. Mémoire 6, Monographie des Fongides. *Annales des Sciences Naturelles, Zoologie* **15(3)** : 73-144.

Hoekesma, B.W. 1989. Systematics and ecology of mushroom corals (Scleractinia : Fungiidae). *Zool. Verhandelingen*, **254** : 1-471.

Cairns, S.D., Hoekesma, B.W. and van der Land, J. 1999. List of extant stony corals. Appendix (pp. 13-46) in S.D. Cairns, Species richness of Recent Scleractinia. *Atoll Research Bulletin*, **459** : 1-46.

Veron, J.E.N. 2000. Corals of the world. 3 vols. *Australian Institute of Marine Science and CRR Qld. Pty. Ltd.*

Description : Polyps are flat or irregular outline. There are little or no central domes. The central fossa is deep. Septa are thick, tightly packed and even, giving the oral disc a smooth appearance. Long and short septa clearly alternate. Cortae are fine and only developed towards the polyp perimeter. Polyps may form more than one mouth and reproduce by autotomy, but this is rare.

Colour : Pale brown

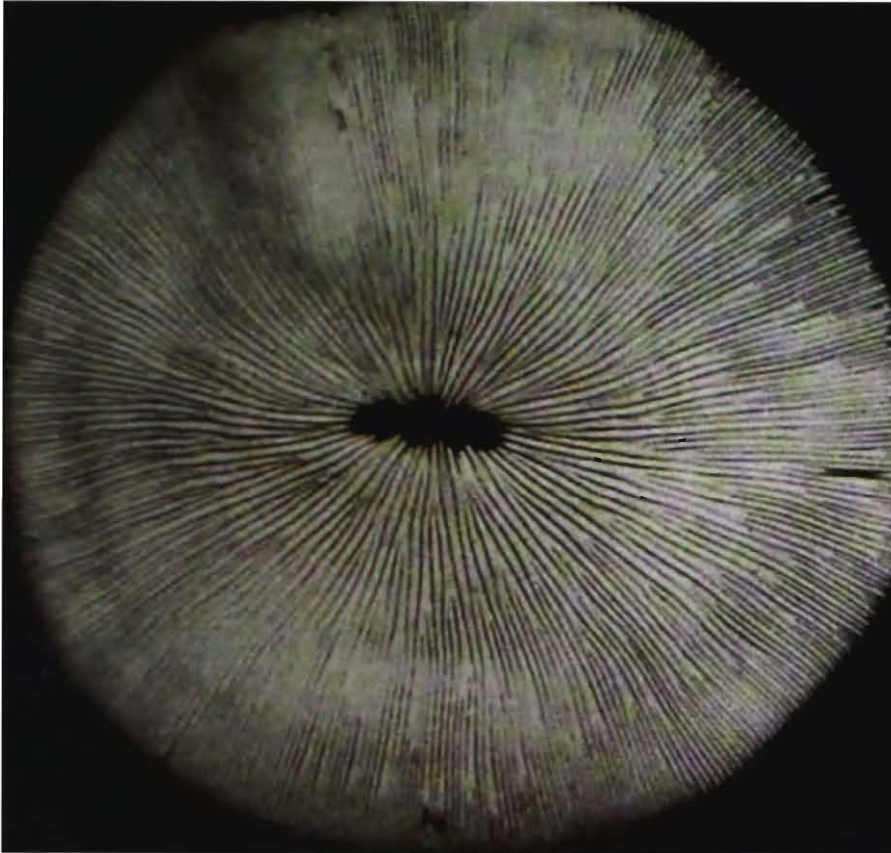


Fig. 2. *Cycloseris sinensis* Milne Edwards and Haime, 1851

Similar species : Large *Cycloseris hexagonalis* are similar if the hexagonal pattern is not discernible. Septa are similar to those of *Diaseris distorta*.

Occurrence : Common

Material Examined : Twenty seven specimens were examined. The smallest one is 2.1 cm in diameter and the largest one is 8.3 cm in diameter.

Distribution : India : Andaman and Nicobar Islands (Sound, Avis and Smith Islands)

Elsewhere : Australia, China, Christmas Island, Fiji, French Polynesia, India, Indonesia, Japan, Maldives, Marshall Islands, Mozambique, New Caledonia, Palau, Papua New Guinea, Philippines, Seychelles, Singapore, Solomon Islands, Sri Lanka, Taiwan, Province of China, United States of America and Viet Nam.

IUCN Red list Category and Criteria : Least Concern.



3. *Cycloseris hexagonalis* (Milne Edwards and Haime, 1848), Fig. 3

Synonym

Fungia hexagonalis Milne Edwards and Haime, 1848.

Taxonomic references

Milne Edwards, H. and Haime, J. 1848. Recherches sur les Polypiers. Mémoire 1, Observations sur la structure et le développement des polypiers en général. *Annales des Sciences Naturelles, Zoologie*. **9(3)** : 37-89.

Hoekesma, B.W. 1989. Systematics and ecology of mushroom corals Scleractinia : Fungiidae). *Zool. Verhandelingen*, **254** : 1-471.

Cairns, S.D., Hoeksema, B.W. and van der Land, J. 1999. List of extant stony corals. Appendix (pp. 13-46) in S.D. Cairns, Species richness of Recent Scleractinia. *Atoll Research Bulletin*, **459** : 1-46.

Veron, J.E.N. 2000. Corals of the world. 3 vols. *Australian Institute of Marine Science and CRR Qld. Pty. Ltd.*

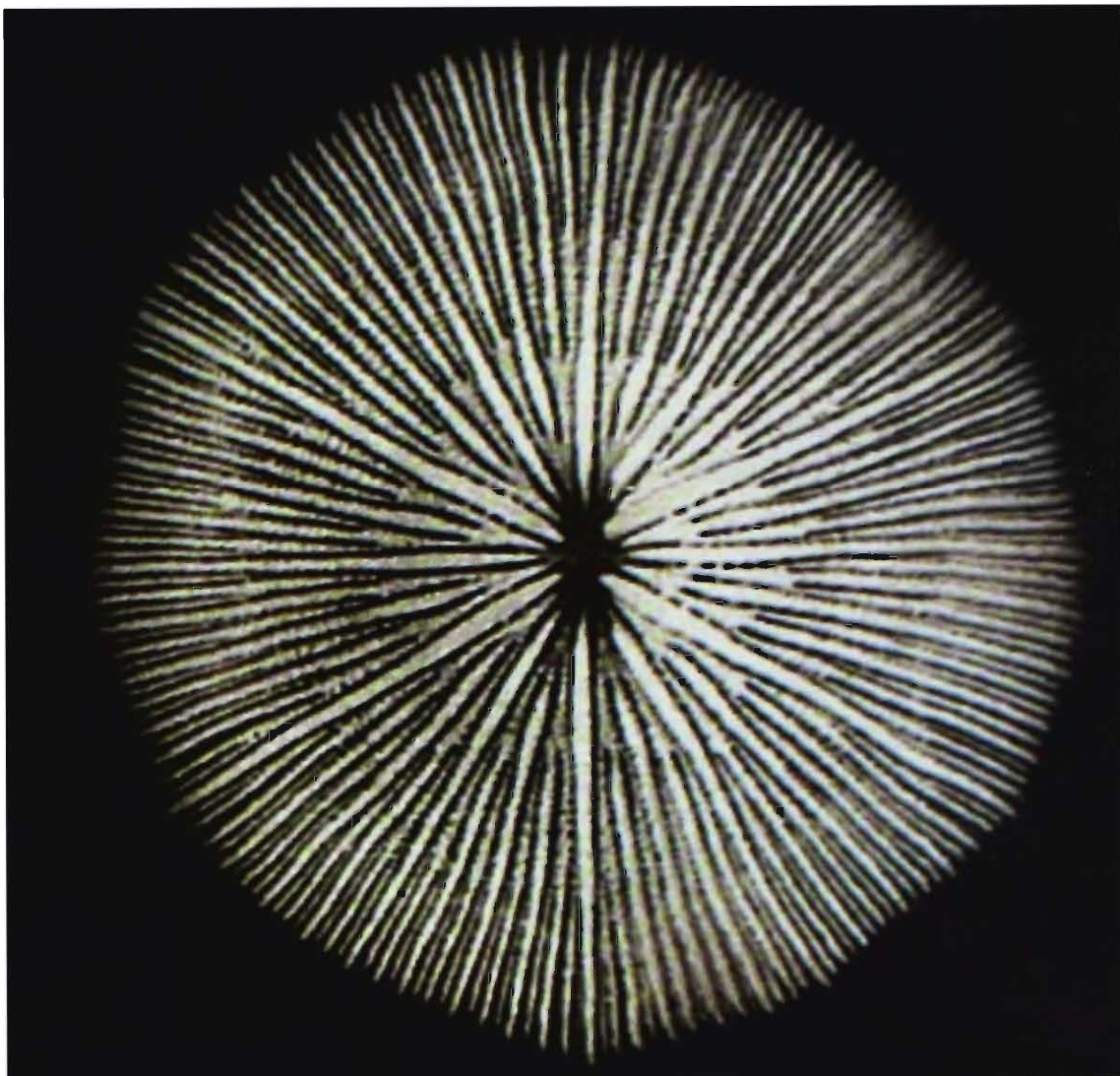


Fig. 3. *Cycloseris hexagonalis* (Milne Edwards and Haime, 1848)

Description : Polyps are flat, with a slight central dome around the mouth, septa are not thickened or exsert around the mouth. Small corals have an angular outline that becomes irregular when fully grown. They reach 90 millimetres diameter septa are thick and unequal. Tentacular lobes are absent. Costae are fine and only developed towards the polyp perimeter.

Colour : Brown, green or yellow. Small polyps often have six pale primary septa resembling spokes of a wheel.

Similar species : *Cycloseris sinensis*, which has a longer mouth, less exsert primary septa and a more uniform shape.

Occurrence : Uncommon.

Material Examined : Four specimens were examined. The largest one was 7.8 cm and smallest one was 3.9 cm in diameter.

Distribution : India : Andaman and Nicobar Islands (Rutland and Grub Islands)

Elsewhere : Fiji, India, Indonesia, Japan, Papua New Guinea, Philippines, Solomon Islands, Sri Lanka, Tonga, United States of America and Viet Nam.

IUCN Red list Category and Criteria : Least Concern.

4. *Cycloseris curvata* (Hoeksema, 1889), Fig. 4

Synonyms

Fungia elegans Verrill, 1870

Cycloseris elegans (Verrill, 1870)

Fungia curvata Hoeksema, 1989.

Taxonomic references

Hoeksema, B.W. 1989. Systematics and ecology of mushroom corals Scleractinia : Fungiidae). *Zool. Verhandelingen*, **254** : 1-471.

Cairns, S.D., Hoeksema, B.W. and van der Land, J. 1999. List of extant stony corals. Appendix (pp. 13-46) in S.D. Cairns, Species richness of Recent Scleractinia. *Atoll Research Bulletin*, **459** : 1-46.





Fig. 4. *Cycloseris curvata* (Hoeksema, 1889)

Veron, J.E.N. 2000. Corals of the world. 3 vols. Australian Institute of Marine Science and CRR Qld. Pty. Ltd.

Description : Polyps are usually strongly arched and up to 90 millimetres diameter. Septa are thick, exsert and curve irregularly when seen from above.

Colour : Brown or green.

Similar species : *Cycloseris cyclolites*, which may have a similar shape but septa, are finer and not overtly curved.

Occurrence : Uncommon.

Material Examined : Six specimens were examined. The diameter of the smallest one is 2.4 cm while the largest is 8.6 cm.

Distribution : India : Andaman and Nicobar Islands (Jolly Bouy and Rutland Islands).



Elsewhere : Australia, Colombia, Costa Rica, Ecuador, Indonesia, Japan, Madagascar, Mexico, Myanmar, Panama, Papua New Guinea, Philippines and United Republic of Tanzania.

IUCN Red list Category and Criteria : Vulnerable.

5. *Cycloseris erosa* (Döderlein, 1901), Fig. 5

Synonym

Fungia erosa Döderlein, 1901.

Taxonomic references

Döderlein, L. 1901. Die Korallen-Gattung *Fungia*. *Zoologische Anzeiger*, **24** : 353-360.

Veron J.E.N. and Pichon, M. 1980. Scleractinia of Eastern Australia. Part 3, Families Agariciidae, Siderasteridae, Fungiidae, Oculinidae, Merulinidae, Mussidae, Pectiniidae, Caryophylliidae, Dendrophylliidae. *Australian Inst. Mar. Sci. Monogr. Ser.*, **IV** : 1-471.

Veron, J.E.N. 2000. Corals of the world. 3 vols. *Australian Institute of Marine Science and CRR Qld. Pty. Ltd.*

Description : Polyps are approximately circular, nearly flat to strongly convex., with a flat or concave undersurface. The central arch is well formed. Septa are irregular, with ragged margins.

Colour : Brown or mottled

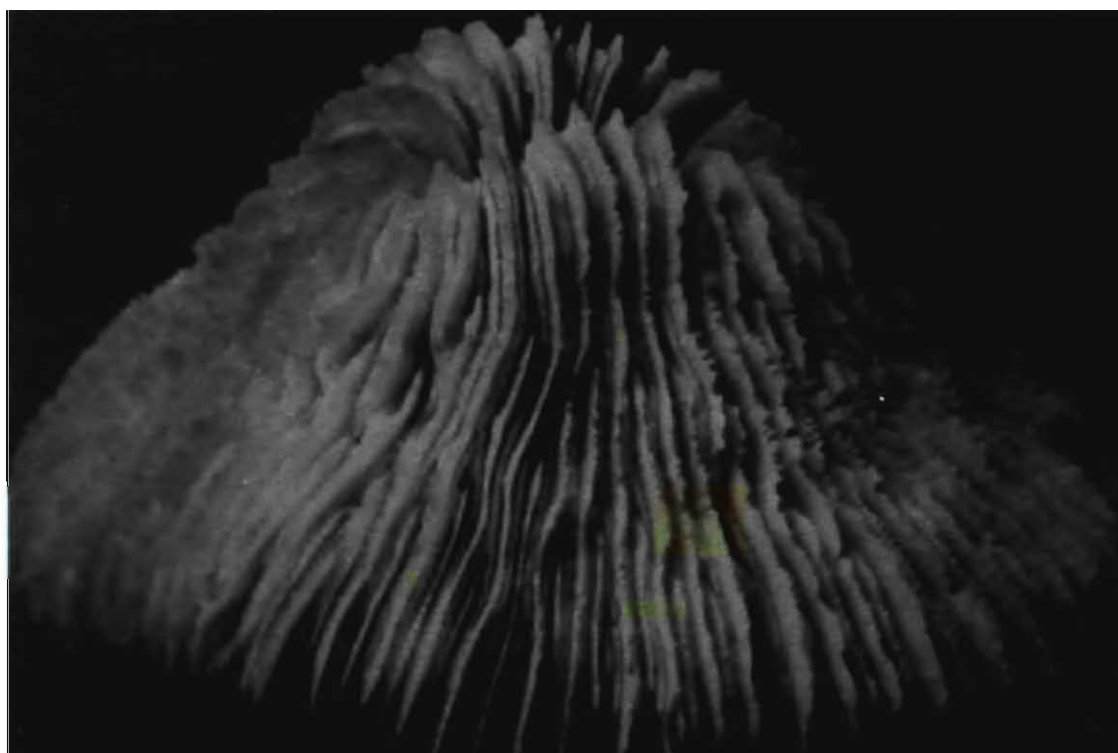


Fig. 5. *Cycloseris erosa* (Döderlein, 1901)

Similar species : *Cycloseris curvata*, which has characteristically curved septa and usually lacks a central arch.

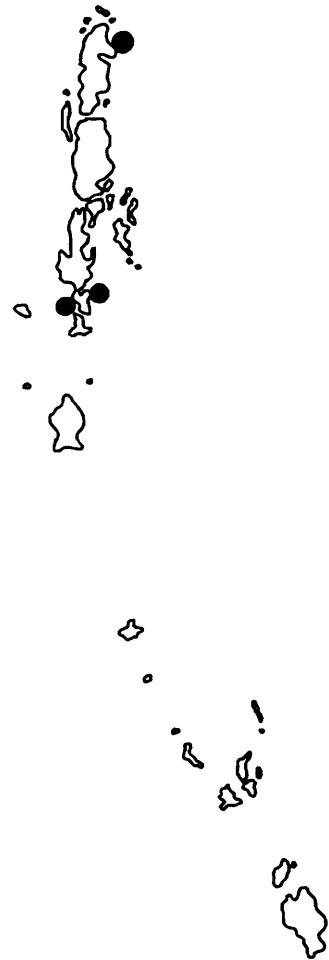
Occurrence Rare

Material Examined 9 specimens were examined. The diameter of the smallest one is 3.1 cm and the largest one is 7.8 cm.

Distribution : India Andaman and Nicobar Islands (Smith Island, Pongibalu and North Bay).

Elsewhere : Ecuador, Indonesia, Madagascar, Malaysia, Papua New Guinea, Philippines, Solomon Islands and United Republic of Tanzania.

IUCN Red list Category and Criteria : No entries found.



6. *Cycloseris somervillei* (Gardiner, 1909), Fig. 6

Synonym

Fungia somervillei Gardiner, 1909.

Taxonomic references

Gardiner, J.S. 1909. The Percy Sladen Trust Expedition to the Indian Ocean in 1905. The madreporarian corals I. The family Fungiidae, with a revision of its genera and species with an account of their geographical distribution. *Trans. Linn. Soc. London, Zool.* (2)12 : 257-290.

Cairns, S.D., Hoeksema, B.W. and van der Land, J. 1999. List of extant stony corals. Appendix (pp. 13-46) in S.D. Cairns, Species richness of Recent Scleractinia. *Atoll Research Bulletin*, 459 : 1-46.

Veron, J.E.N. 2000. Corals of the world. 3 vols. *Australian Institute of Marine Science and CRR Qld. Pty. Ltd.*

Description : Polyps are oval and flat, with an arched central dome and a flat undersurface. The axial furrow is elongate. Primary septa are exert on the central dome.

Colour : Pale brown or mottled.

Similar species *Cycloseris patelliformis*, which is not distinctly oval.



Fig. 6. *Cycloseris somervillei* (Gardiner, 1909)

Occurrence : Usually uncommon

Material Examined : Two specimens were examined. The length width of the smallest one is 5.3 cm and 3.7 cm respectively and the length of axial furrow is 1.9 cm and that elongated to some extent. Whereas the length and width of the largest one is 7.8 cm and 6.1 cm respectively and the length of axial furrow is 3.6 cm and that elongated to some extent.

Distribution : India : Andaman and Nicobar Islands (Rutland Island), and Lakshadweep Islands

Elsewhere : Australia, British Indian Ocean Territory, Fiji, Guam, India, Indonesia, Japan, Kuwait, Madagascar, Maldives, Mauritius, Myanmar, Papua New Guinea, Philippines, Seychelles, Solomon Islands, Taiwan, Province of China and Viet Nam.

IUCN Red list Category and Criteria : Least Concern.



7. *Cycloseris tenuis* (Dana, 1846), Fig. 7

Synonyms

Fungia cooperi Gardiner, 1909.

Fungia marginata Boschma, 1923.

Cycloseris cooperi (Gardiner, 1909).

Cycloseris marginata (Boschma, 1923).

Fungia tenuis Dana, 1848.

Taxonomic references

Dana, J.D. 1846. Zoophytes. United States Exploring Expedition during the years 1831-1842 under the command of Charles Wilkes, **8** : 1-740. Lea and Blanchard. –Philadelphia.

Hoekesma, B.W. 1989. Systematics and ecology of mushroom corals (Scleractinia : Fungiidae). *Zool. Verhandelingen*, **254** : 1-471.

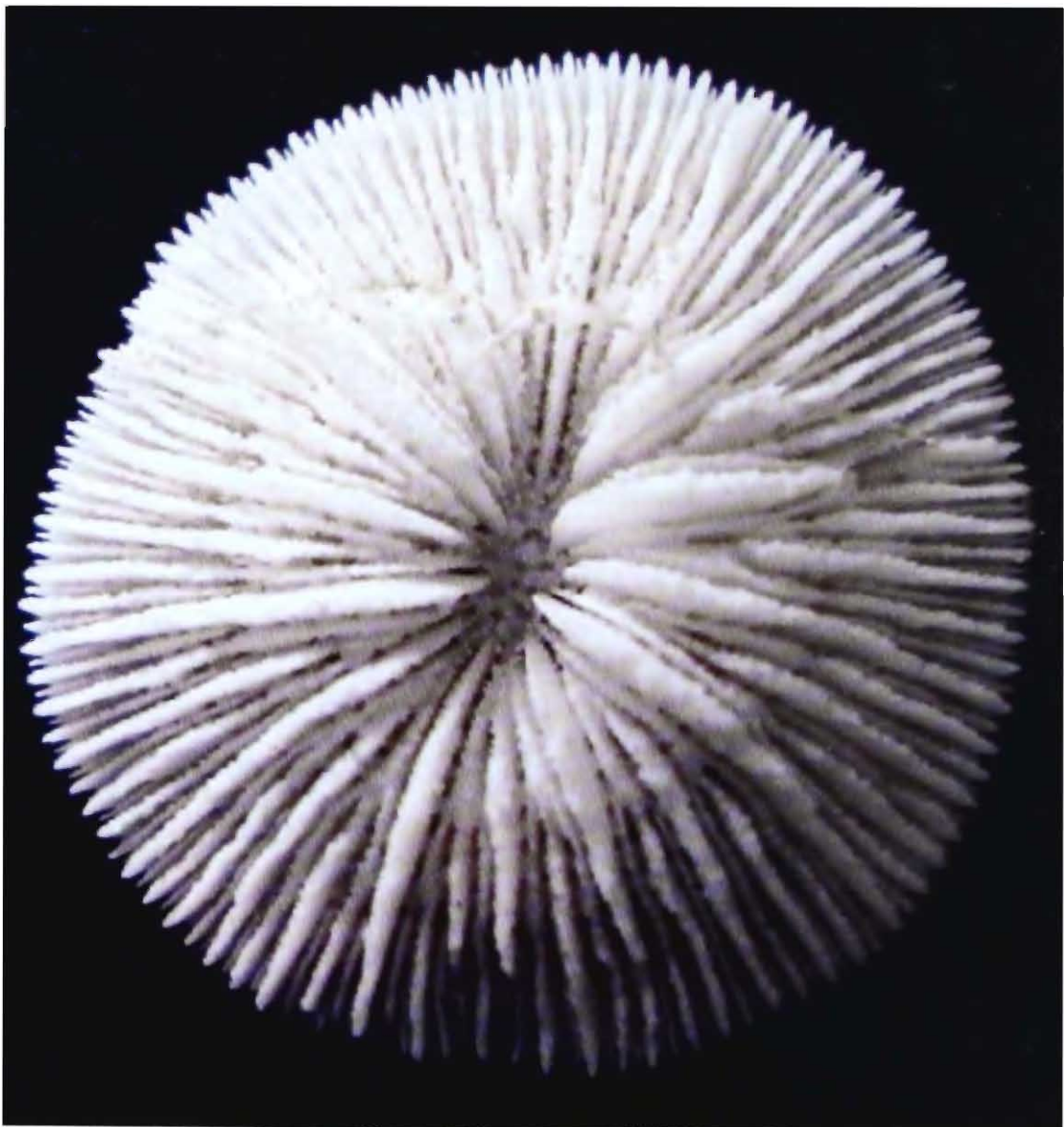


Fig. 7. *Cycloseris tenuis* (Dana, 1846)

Cairns, S.D., 1991. Catalog of the type specimens of stony corals (Milleporidae, Stylasteridae, Scleractinia) in the National Museum of Natural History, Smithsonian Institution. *Smithsonian Contributions to Zoology*, (514) : 1-59.

Cairns, S.D., Hoeksema, B.W. and van der Land, J. 1999. List of extant stony corals. Appendix (pp. 13-46) in S.D. Cairns, Species richness of Recent Scleractinia. *Atoll Research Bulletin*, 459 : 1-46.

Veron, J.E.N. 2000. Corals of the world. 3 vols. *Australian Institute of Marine Science and CRR Qld. Pty. Ltd.*

Description : Polyps are circular, thin and flat. Septa are markedly different orders but each septum is uniform throughout its length. Costae on the undersurface are thick and irregularly arranged.

Colour : Pale brown or yellow.

Similar species : *Cycloseris costulata*, which has thinner and more regular costae.

Occurrence : Rare.

Material Examined : Thirty one specimens were examined. The diameter of smallest specimen is 2.1 cm with the length of axial furrow of 0.7 cm. Whereas the largest specimen is 7.2 cm in diameter and the length of the axial furrow is 1.9 cm.

Distribution : India : Andaman and Nicobar Islands (Sound, Avis and Rutland Islands)

Elsewhere : Australia, British Indian Ocean Territory, Djibouti, Fiji, Guam, Indonesia, Israel, Japan, Madagascar, Malaysia, Maldives, Micronesia (Federated States of), Mozambique, Palau, Papua New Guinea, Philippines, Pitcairn, Seychelles, Singapore, Solomon Islands, Sri Lanka, Taiwan, Province of China, Thailand, Tonga, United States of America and Viet Nam.

IUCN Red list Category and Criteria : Least Concern.



8. *Cycloseris costulata* (Ortmann, 1889), Fig. 8

Synonym

Fungia sibogae van der Horst, 1921.

Fungia marginata Boschma, 1923.

Cycloseris marginata (Boschma, 1923).

Fungia costulata Ortmann, 1889.

Taxonomic references

Ortmann, A. 1889. Beobachtungen an Steinkorallen von der Südküste Ceylons. *Zool. Jahrb. Abt. Syst. Geogr. Biol. Thiere*, 4 : 493-590.

Veron, J.E.N. and Pichon, M. 1980. Scleractinia of Eastern Australia. Part 3, Families Agariciidae, Siderasteridae, Fungiidae, Oculinidae, Merulinidae, Mussidae, Pectiniidae, Caryophylliidae, Dendrophylliidae. *Australian Inst. Mar. Sci. Monogr. Ser.*, IV : 1-471



Fig. 8. *Cycloseris costulata* (Ortmann, 1889)

Cairns, S.D., Hoeksema, B. W. and van der Land, J. 1999. List of extant stony corals. Appendix (pp. 13-46) in S.D. Cairns, Species richness of Recent Scleractinia. *Atoll Research Bulletin*, **459** : 1-46.

Veron, J.E.N. 2000. Corals of the world. 3 vols. *Australian Institute of Marine Science and CRR Qld. Pty. Ltd.*

Description : Polyps are circular, helmet-shaped and up to 80 millimetres diaeter, with a concave undersurface. Primary septa are thick and exsert around the mouth.

Colour : Pale cream or brown, sometimes with violet margins.

Similar species : *Cycloseris tenuis*. *Cycloseris cyclolites* is more strongly dome-shaped and septa around the mouth are less exsert. *Cycloseris erosa* and *Fungia granulosa* are larger and thicker.

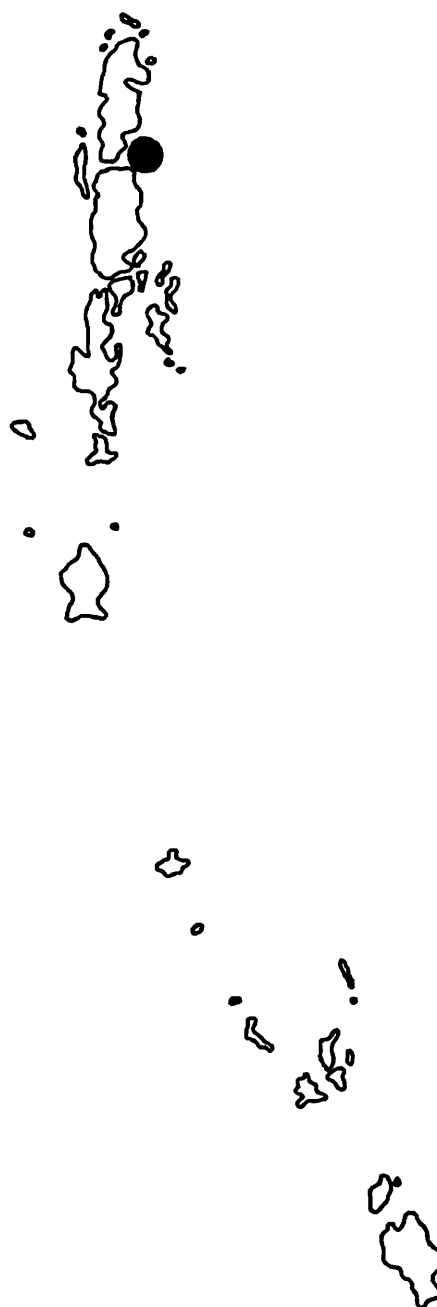
Occurrence : Rare

Material Examined : Two specimens were examined. The diameter of smallest specimen is 5.1 cm and the length of the axial furrow is 1.8 cm whereas the largest specimen is 10 cm in diameter with 2.0 cm length of axial furrow.

Distribution : India : Andaman and Nicobar Islannds (Sound and Avis Islands)

Elsehwere : Australia, British Indian Ocean Territory, Cook Islands, Djibouti, Egypt, Fiji, French Polynesia, Guam, India, Indonesia, Israel, Japan, Kenya, Kiribati, Madagascar, Malaysia, Maldives, Marshall Islands, Mozambique, New Caledonia, Palau, Papua New Guinea, Philippines, Samoa, Seychelles, Solomon Islands, South Africa, Sri Lanka, Taiwan, Province of China, Thailand and Viet Nam.

IUCN Red list Category and Criteria : Least Concern.



9. *Cycloseris patelliformis* (Boschma, 1923), Fig. 9

Synonym

Fungia patelliformis Boschma, 1923

Taxonomic references

Boschma, H. 1923. The Madreporaria of the Siboga Expedition, part 4 : *Fungia patella*. *Siboga-Expeditie Monogr.*, **96**(16d) : 129-148.

Wells, J.W. 1954. Recent corals of the Marshall Islands. *Professional Paper, United States Geological Survey*, **260** : 385-486.

Veron, J.E.N. and Pichon, M. 1980. Scleractinia of Eastern Australia. Part 3, Families Agariciidae, Siderasteridae, Fungiidae, Oculinidae, Merulinidae, Mussidae, Pectiniidae, Caryophylliidae, Dendrophylliidae. *Australian Inst. Mar. Sci. Monogr. Ser.*, **IV** : 1-471.

Veron, J.E.N. 2000. Corals of the world. 3 vols. *Australian Institute of Marine Science and CRR Qld. Pty. Ltd.*

Description : Polyps are circular to slightly oval, with a large central dome and nearly flat undersurface. Costae and septa do not alternate at the polyp margin.

Colour : Pale mottled brown or cream, sometimes with a dark perimeter and/or violet mouth.

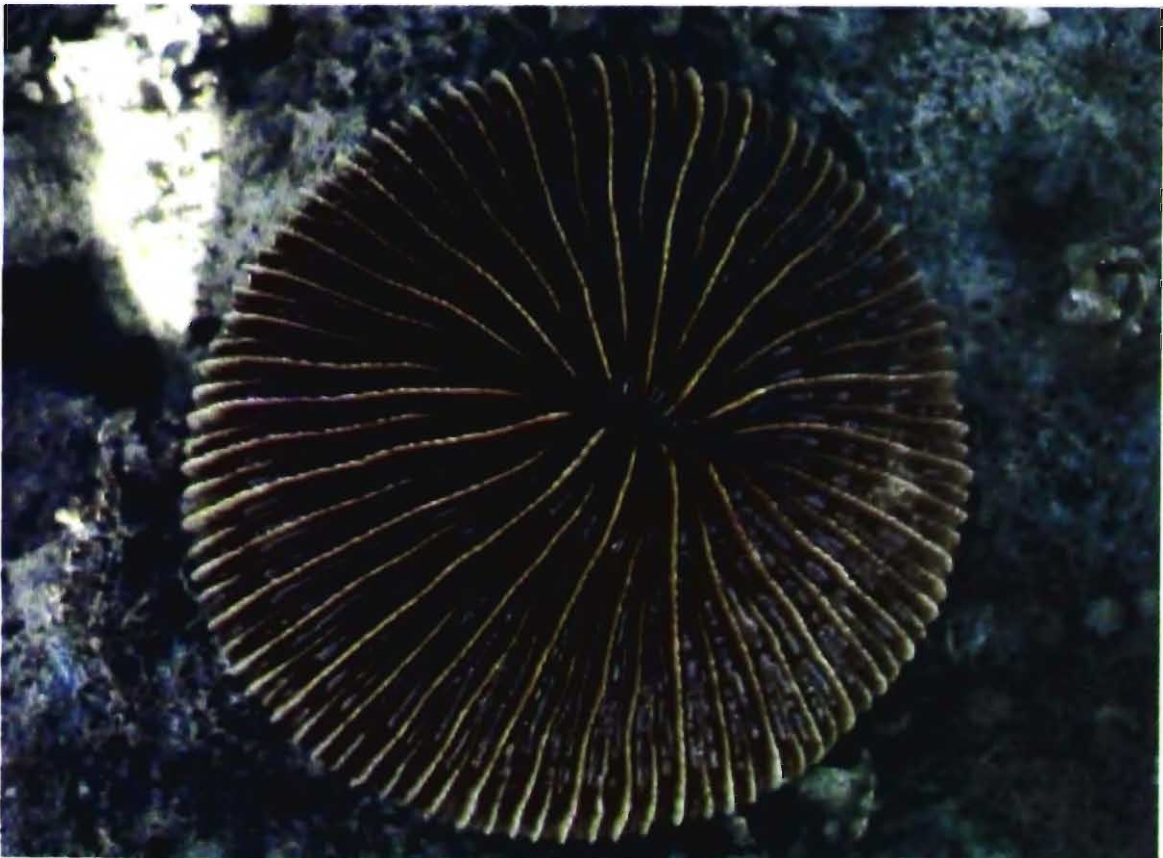


Fig. 9. *Cycloseris patelliformis* (Boschma, 1923)

Similar species : *Cycloseris vaughani*.
Cycloseris somervillei, which is clearly oval.

Occurrence : Usually uncommon

Material Examined : Six specimens were examined. The diameter of smallest specimen is 4.2 cm and the length of the axial furrow is 1.8 cm, whereas the largest specimen is 8.2 cm in diameter and the length of the axial furrow is 3.6 cm.

Distribution : India : Andaman and Nicobar Islands (Rutland Island and North Bay)

Elsewhere : American Samoa, Australia, Egypt, Fiji, Indonesia, Japan, Jordan, Madagascar, Malaysia, Oman, Papua New Guinea, Solomon Islands, Vanuatu and Viet Nam.

IUCN Red list Category and Criteria : No entries found.



Genus *Diaseris* Milne Edwards and Haime, 1849

Taxonomic reference

Veron, J.E.N. and Pichon, M. 1980. Scleractinia of Eastern Australia. Part 3, Families Agariciidae, Siderasteridae, Fungiidae, Oculinidae, Merulinidae, Mussidae, Pectiniidae, Caryophylliidae, Dendrophylliidae. *Australian Inst. Mar. Sci. Monogr. Ser.*, IV : 471 pp.

Veron, J.E.N. 2000. Corals of the world. 3 vols. *Australian Institute of Marine Science and CRR Qld. Pty. Ltd.*

Description : Corals are flat, solitary, free-living polyps which are composed of several fan-shaped segments with a mouth situated at the point of divergence of the segments. Septa are thick with blunt teeth resembling rows of granules. Corals are commonly inflated with water. The increased surface area this creates may help to prevent burial in soft substrates and may also facilitate movement across the substrate.

Similar genus : *Diaseris* resembles only *Cycloseris*.

10. *Diaseris distorta* (Michelin, 1843), Fig. 10

synonyms

Angia mexicana (Durham, 1947).

Angia pulchella (Verrill, 1866).

Acloseris mexicana Durham, 1947.

Acloseris distorta (Michelin, 1843).

Diaseris pulchella Verrill, 1866.

Angia distorta (Michelin, 1842).

Dendrophyllum distortum Michelin, 1843.

taxonomic references

Michelin, H. 1842. Description d'une nouvelle espèce de Zoophyte du genre Fongie. *Rev. Zool.*, 5 : 316.

Stearns, J.E.N. and Pichon, M. 1980. Scleractinia of Eastern Australia. Part 3, Families Agariciidae, Siderasteridae, Fungiidae, Oculinidae, Merulinidae, Mussidae, Pectiniidae, Caryophylliidae, Dendrophylliidae. *Australian Inst. Mar. Sci. Monogr. Ser.*, IV : 1-471.

Cairns, S.D., Hoeksema, B.W. and van der Land, J. 1999. List of extant stony corals. Appendix (pp. 13-46) in S.D. Cairns, Species richness of Recent Scleractinia. *Atoll Research Bulletin*, 459 : 1-46.

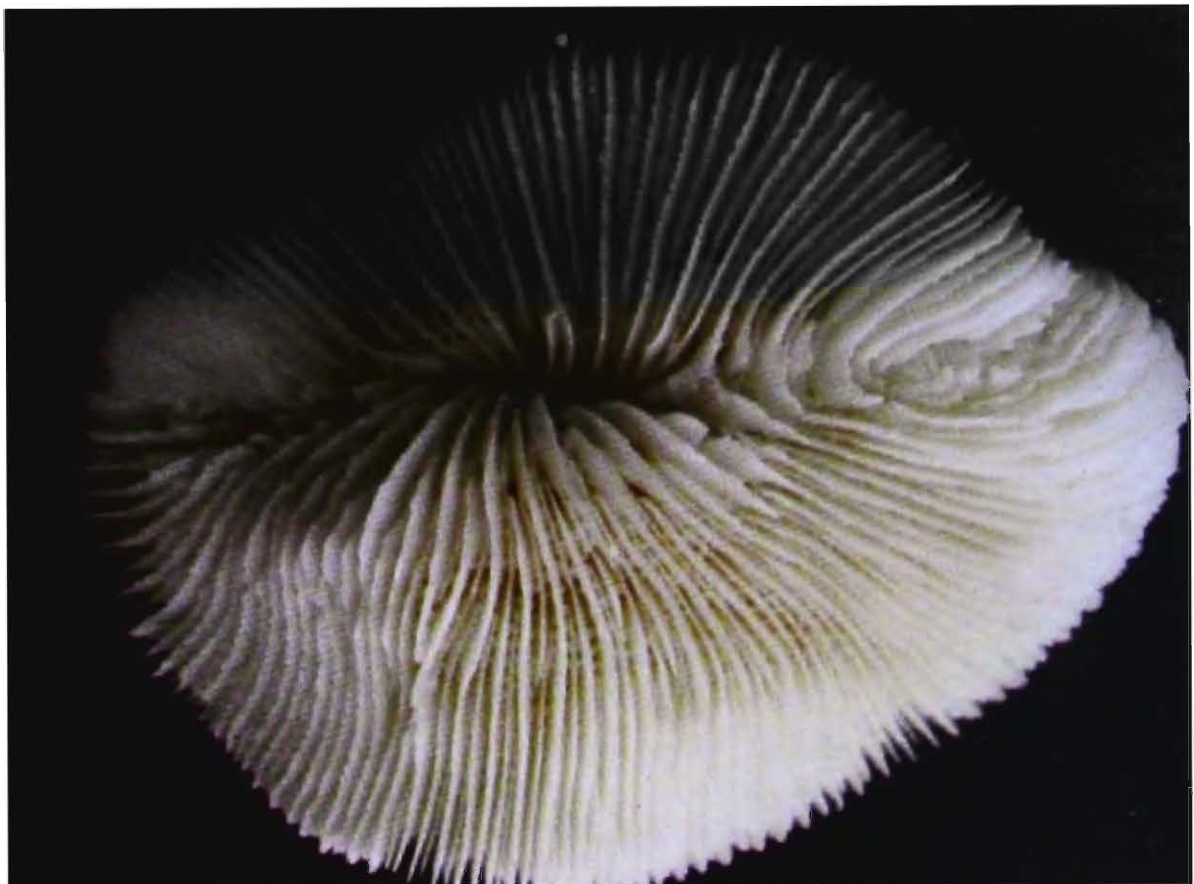


Fig. 10. *Diaseris distorta* (Michelin, 1843)

Veron, J.E.N. 2000. Corals of the world. 3 vols. *Australian Institute of Marine Science and CRR Qld. Pty. Ltd.*

Description : Polyps consists of fan shaped segments. Thick beaded septa are of unequal height. Polyps are commonly inflated with water to several times the volume of the skeleton.

Colour : Cream brown, sometimes mottled.

Similar species : *Diaseris fragilis*, which is larger with thinner margins and has septa of uniform height.

Occurrence : Common.

Material Examined : Fifteen specimens were examined. The length of the largest specimen is 14.2 cm. and the smallest one is 4.7 cm.

Distribution : India : Andaman and Nicobar Islands (Sound Island, Ross Island, Smith Island, Avis Island, Sound Island and Ritchie's Archipelago).

Elsewhere : Australia, British Indian Ocean Territory, Colombia, Costa Rica, Ecuador, Egypt, Fiji, French Polynesia, India, Indonesia, Israel, Japan, Madagascar, Malaysia, Maldives, Marshall Islands, Mexico, Mozambique, Myanmar, Oman, Palau, Panama, Papua New Guinea, Philippines, Saudi Arabia, Seychelles, Solomon Islands, South Africa, Sri Lanka, Thailand, United Republic of Tanzania, United States of America and Viet Nam.

IUCN Red list Category and Criteria : Least Concern.

11. *Diaseris fragilis* Alcock, 1893, Fig. 11

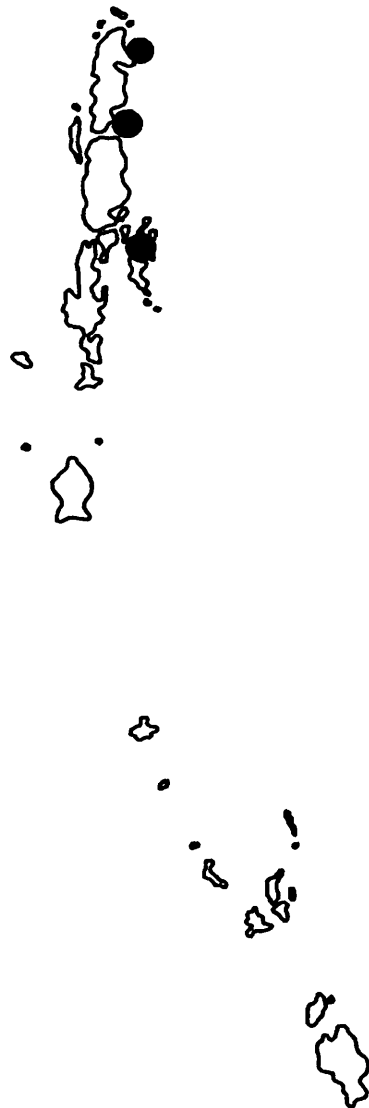
Synonyms

Fungia laciniosa Boschma, 1925

Fungia fragilis (Alcock, 1893)

Taxonomic references

Alcock, A.W. 1893. On some newly-recorded corals from the Indian seas. *Journal of the Asiatic Society of Bengal*, 62(2) : 138-149



Veron, J.E.N. and Pichon, M., 1980. Scleractinia of Eastern Australia. Part 3, Families Agariciidae, Siderasteridae, Fungiidae, Oculinidae, Merulinidae, Mussidae, Pectiniidae, Caryophylliidae, Dendrophylliidae. *Australian Inst. Mar. Sci. Monogr. Ser.*, IV : 1-471.

Cairns, S.D., Hoeksema, B.W. and van der Land, J. 1999. List of extant stony corals. Appendix (pp. 13-46) in S.D. Cairns, Species richness of Recent Scleractinia. *Atoll Research Bulletin*, 459 : 1-46.

Veron, J.E.N. 2000. Corals of the world. 3 vols. *Australian Institute of Marine Science and CRR Qld. Pty. Ltd.*

Description : Polyps are irregular in outline, up to 70 millimetres across and generally composed of several wedge-shaped sectors which readily break part. The beaded septa are approximately equal in height.

Colour : Greyish-yellow or beige, often with green margins or centres.

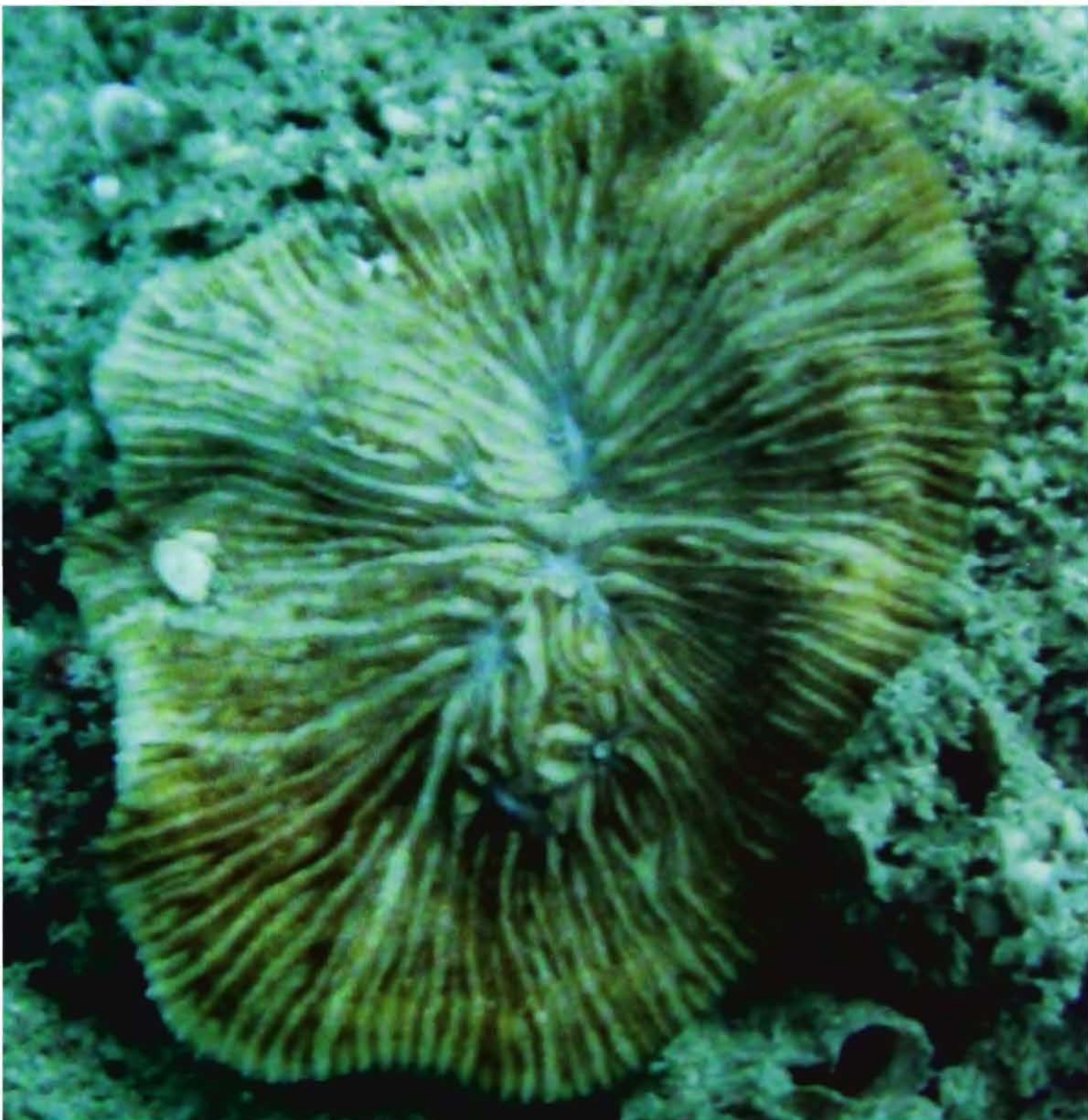


Fig. 11. *Diaseris fragilis* Alcock, 1893

Similar species : *Diaseris distorta*.

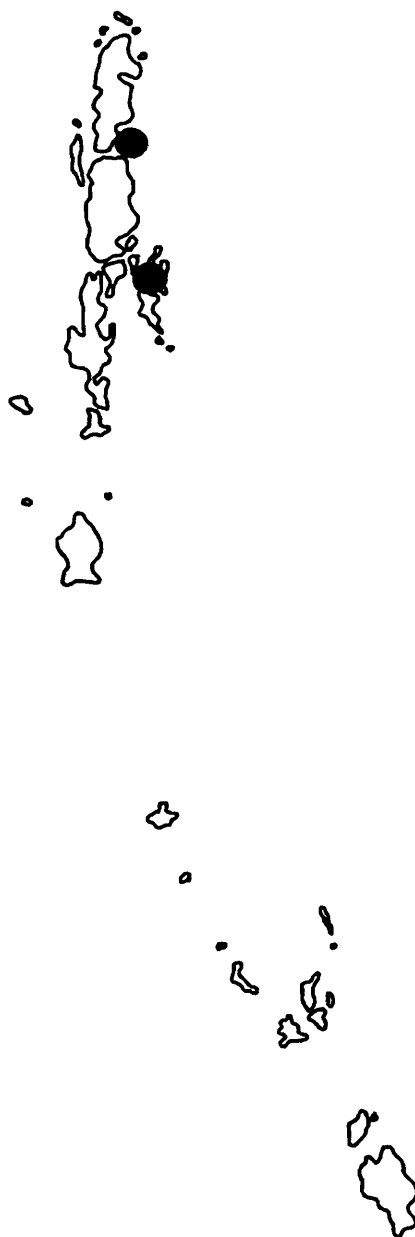
Occurrence : Uncommon.

Material Examined : Eleven specimens were examined. The length of the largest specimen is 6.8 cm. and the smallest one is 4.2 cm.

Distribution : India : Andaman and Nicobar Islands (Avis Island, Sound Island and Ritchie's Archipelago).

Elsewhere : Australia, Guam, India, Indonesia, Japan, Madagascar, Malaysia, Maldives, Marshall Islands, Mozambique, New Caledonia, Palau, Papua New Guinea, Philippines, Samoa, Seychelles, Solomon Islands, Taiwan, Province of China, Thailand, United States of America and Viet Nam.

IUCN Red list Category and Criteria : Least Concern.



Genus *Cantharellus* Hoeksema and Best, 1984

Taxonomic references

Hoeksema, B.W. 1989. Systematics and ecology of mushroom corals (Scleractinia : Fungiidae). *Zool Verhandelingen*, 254 : 1-471.

Veron, J.E.N. 2000. Corals of the world. 3 vols. *Australian Institute of Marine Science and CRR Qld. Pty. Ltd.*

Description : Polyps have one, or sometimes several, centres. They are permanently attached to the substrate. Septa and costae have simple ornamentations, usually only fine granules.

Similar Genera : *Cycloseris* and *Diaseris*, but attached to the substrate.

12. *Cantharellus jebbi* Hoeksema, 1993, Fig. 12

Taxonomic references

Hoeksema, B.W. 1993. Mushroom corals (Scleractinia : Fungiidae) of Madang Lagoon, northern Papua New Guinea : An annotated checklist with the description of *Cantharellus jebbi* spec. nov. *Zoologische Mededelingen* **67** : 1-19.

Cairns, S.D., Hoeksema, B.W. and van der Land, J. 1999. List of extant stony corals. Appendix (pp. 13-46) in S.D. Cairns, Species richness of Recent Scleractinia. *Atoll Research Bulletin*, **459** : 1-46.

Veron, J.E.N. 2000. Corals of the world. 3 vols. *Australian Institute of Marine Science and CRR Qld. Pty. Ltd.*

Description : Solitary or colonial. Solitary polyps are small (up to 70 mm diameter) and tightly encrust the substrate. Colonies are uncommon but are relatively conspicuous, up to 0.2 metres across. Septa are thick and weavy.

Colour : Light brown.



Fig. 12. *Cantharellus jebbi* Hoeksema, 1993

Similar species : Like *Lithophyllon mokai* but usually has only one centre. Septa are like *Cantharellus doederleini* but the latter is not completely encrusting.

Occurrence : Uncommon

Material Examined : Three specimens were examined. The diameter of largest specimen is 6.6 cm. and the smallest one is 4.5 cm.

Distribution : India : Andaman and Nicobar Islands (Smith Island and Richie's Archipelago)

Elsewhere : Fiji, Guam, Indonesia, Japan, Papua New Guinea and Solomon Islands.

IUCN Red list Category and Criteria : Least Concern.



13. *Cantharellus noumeae* Höksema and Best, 1984

Fig. 13

Synonym

Cycloseris noumeae (Hoeksema and Best, 1984)

Taxonomic references

Hoeksema, B.W. and Best, M.B. 1984. *Cantharellus noumeae* (gen. nov., spec. nov.), a new scleractinian coral (Fungiidae) from New Caledonia. *Zoologische Mededelingen*, **58** : 323-328.

Hoeksema B.W. 1989. Systematics and ecology of mushroom corals (Scleractinia : Fungiidae). *Zool. Verhandelingen*, **254** : 1-471.

Cairns, S. D., Hoeksema, B.W. and van der Land, J. 1999. List of extant stony corals. Appendix (pp. 13-46) in S.D. Cairns, Species richness of Recent Scleractinia. *Atoll Research Bulletin*, **459** : 1-46

Veron, J.E.N. 2000. Corals of the world. 3 vols. *Australian Institute of Marine Science and CRR Qld. Pty. Ltd.*



Fig. 13. *Cantharellus noumeae* Höksema and Best, 1984

Description : Polyps are small, cup-shaped when fully developed, and have wavy margins. The species may be solitary or colonial, the latter consisting of a few contorted corallites. Primary septa are thin and usually smooth edged.

Colour : Brown.

Similar species : *Cycloseris doederleini*, which is smaller with thick septa.

Occurrence : Rare

Material Examined : One specimen was examined. The length and width of the specimen are 8.8 cm and 6.7 cm respectively.

Distribution : India : Andaman and Nicobar Islands (Pongibalu- South Andaman)

Elsewhere : Australia, Indonesia, New Caledonia, Papua New Guinea, Philippines and Saudi Arabia.

IUCN Red List Category and Criteria : Endangered.



Genus *Fungia* Lamarck, 1801**Taxonomic references**

- Wells, J.W. 1966. Evolutionary development of the scleractinian family Fungiidae. In : Rees, W.J. (ed.) The Cnidaria and their evolution. *Symp. Zool. Soc. London*, **16** : 223-246.
- Veron, J.E.N. and Pichon, M. 1980. Scleractinia of Eastern Australia. Part 3, Families Agariciidae, Siderasteridae, Fungiidae, Oculinidae, Merulinidae, Mussidae, Pectiniidae, Caryophylliidae, Dendrophylliidae. *Australian Inst. Mar. Sci. Monogr. Ser.*, **IV** : 1-471.
- Hoekesma, B.W. 1989. Systematics and ecology of mushroom corals (Scleractinia : Fungiidae). *Zool Verhandelingen*, **254** : 1-471.

Description : Corals are usually solitary, generally free-living except for juveniles, flat or dome shaped, and circular or elongate in outline, with a central mouth. Septa have large or small, rounded to pointed teeth. Costae consists mostly of rows of spines the skeleton often has pits between the costae on the lower surface. Tentacles may be extended during the day and are short and widely spaced.

Similar Genera : *Fungia* is distinguished from *Ctenactis* by the latter's elongate shape, axial furrow, and lobed septal teeth. *Fungia* is distinguished from *Heliofungia* by the latter's large, lobed septal teeth and large anemone-like polyps. *Fungia* is distinguished from *Cycloseris* by being larger, frequently being elongate, often by having septa with large teeth and costae with large spines, and sometimes having pits between the coastae.

14. *Fungia scruposa* Klunzinger, 1879, Fig. 14**Synonyms**

- Fungia subrepanda* Döderlein, 1901.
Fungia rugosa Quelch, 1886.
Fungia lobulata Ortmann, 1889.
Fungia madagascariensis Vaughan, 1906.
Fungia fieldi Gardiner, 1909.

Taxonomic references

- Veron, J.E.N. and Pichon, M. 1980. Scleractinia of Eastern Australia. Part 3, Families Agariciidae, Siderasteridae, Fungiidae, Oculinidae, Merulinidae, Mussidae, Pectiniidae, Caryophylliidae, Dendrophylliidae. *Australian Inst. Mar. Sci. Monogr. Ser.* **IV** : 1-471.

Hoekesma, B.W. 1989. Systematics and ecology of mushroom corals (Scleractinia : Fungiidae). *Zool. Verhandelingen*, **254** : 1-471.

Cairns, S. D., Hoeksema, B.W. and van der Land, J. 1999. List of extant stony corals. Appendix (pp. 13-46) in S.D. Cairns, Species richness of Recent Scleractinia. *Atoll Research Bulletin*, **459** : 1-46.

Veron, J.E.N. 2000. Corals of the world. 3 vols. *Australian Institute of Marine Science and CRR Qld. Pty. Ltd.*

Description : Polyps are circular or oval, up to 240 millimetres diameters, not strongly arched, thick and heavy. Septa are densely packed and often wavy. Tentacular lobes may be present. Costae are very unequal, with simple spines. The under surface has extensive perforations between costae.

Colour : Usually Brown.

Similar species : *Fungia corona* (thin polyp disc, *Fungia danai*).

Occurrence : Uncommon

Material Examined : Three specimens were examined. The diameter of largest specimen is 22.3 cm and the smallest one is 4.8 cm.



Fig. 14. *Fungia scruposa* Klunzinger, 1879

Distribution : India : Andaman and Nicobar Island (Rutland Island).

Elsewhere : American Samoa, Australia, British Indian Ocean Territory, Cambodia, Comoros, Cook Islands, Djibouti, Egypt, Eritrea, Fiji, French Polynesia, India, Indonesia, Israel, Japan, Jordan, Kenya, Kiribati, Madagascar, Malaysia, Maldives, Marshall Islands, Mauritius, Mayotte, Micronesia, Federated States of, Mozambique, Nauru, New Caledonia, Niue, Northern Mariana Islands, Oman, Palau, Papua New Guinea, Philippines, Réunion, Samoa, Saudi Arabia, Seychelles, Singapore, Solomon Islands, Somalia, Sudan, Taiwan, Province of China, Tanzania, United Republic of, Thailand, Tokelau, Tonga, Tuvalu, United States Minor Outlying Islands, Vanuatu, Viet Nam, Wallis and Futuna and Yemen.

IUCN Red list Category and Criteria : Least Concern.



15. *Fungia corona* Doderlein, 1901, Fig. 15

Taxonomic references

Döderlein, L. 1901. Die Korallen-Gattung *Fungia*. *Zoologische Anzeiger*, **24** : 353-360.

Veron J.E.N. and Pichon, M. 1980. Scleractinia of Eastern Australia. Part 3, Families Agariciidae, Siderasteridae, Fungiidae, Oculinidae, Merulinidae, Mussidae, Pectiniidae, Caryophylliidae, Dendrophylliidae. *Australian Inst. Mar. Sci. Monogr. Ser.*, **IV** : 1-471.

Veron, J.E.N. 2000. *Corals of the world*. 3 vols. Australian Institute of Marine Science and CRR Qld. Pty. Ltd.

Description : Polyps have an irregular outline, flat to strongly convex, thin and light. Septa are markedly different sizes and have large

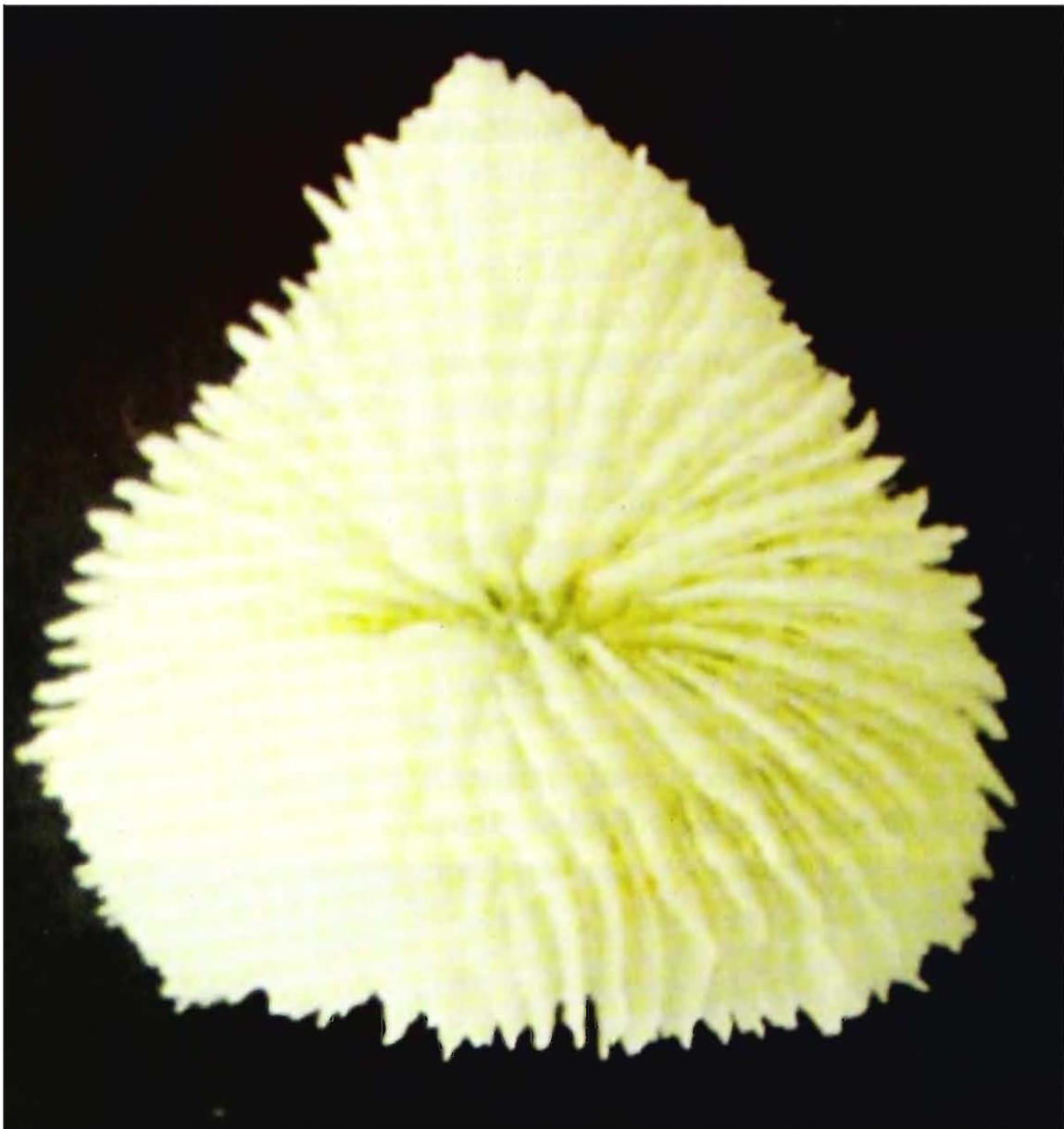


Fig. 15. *Fungia corona* Doderlein, 1901

pointed teeth. Tentacular lobes are weakly developed. Costae are widely spaced, the larger having simple spines. The under surface has pits between the costae.

Colour : Pale brown often with pale septal margins and tentacular lobes.

Similar species : *Fungia danai* and *Fungia scruposa*.

Occurrence : Common.

Material Examined : Twenty seven specimens were examined. The diameter of largest specimen is 11.8 cm and the smallest one is 4.3 cm.

Distribution : India : Andaman and Nicobar Islands (Avis Island, Sound Island, Rail Island, Smith Island, Ross Island, North Reef Island,



Interview Island, Rutland Island, Grub Island, Jolly Bouy Island, Pongibalu, North Bay, Great Nicobar Island and Ritchie's Archipelago).

Elsewhere : Fiji, Indonesia, Philippines, United Republic of Tanzania and Viet Nam.

IUCN Red list Category and Criteria : No entries found.

16. *Fungia danai* Milne Edwards and Haime, 1851, Fig. 16**Taxonomic references**

Veron J.E.N. and Pichon, M. 1980. Scleractinia of Eastern Australia. Part 3. Families Agariciidae, Siderasteridae, Fungiidae, Oculinidae, Merulinidae, Mussidae, Pectiniidae, Caryophylliidae, Dendrophylliidae. *Australian Inst. Mar. Sci. Monogr. Ser.*, **IV** : 1-471.

Veron, J.E.N. 2000. *Corals of the world*. 3 vols. Australian Institute of Marine Science and CRR Qld. Pty. Ltd.

Description : Polyps are circular, upto 300 millimetres diameter and not heavily calcified, with a strong central arch. Septa are straight and have very large teeth and a prominent tentacular lobe. Costae are compact, with large branching spines of different sizes on different orders. The under surface has pits between the costae but few deep perforations.

Colour : Brown, sometimes mottled, with pale septal margins and tentacular lobes.



Fig. 16. *Fungia danai* Milne Edwards and Haime, 1851

Similar species : *Fungia horrida* (does not have prominent tentacular lobes and has pits or perforations on the surface), *Fungia corona* (Does not have strong central arch and has a thinner, more irregular polyp disc, with many perforations).

Occurrence Common

Material Examined : Twenty one specimens were examined. The diameter of largest specimen is 29.1 cm while the smallest one is 3.7 cm.

Distribution : India : Andaman and Nicobar Islands (Avis Island, Sound Island, Rail Island, Smith Island, Ross Island, North Reef Island, Interview Island, Rutland Island, Grub Island, Jolly Bouy Island, Pongibalu, North Bay Island, Great Nicobar Island and Ritchie's Archipelago) and Lakshadweep Islands.

Elsewhere : Australia, Cook Islands, Fiji, Indonesia, Irian Jaya, Madagascar and Viet Nam.

IUCN Red List Category and Criteria :
No entries found.

17. *Fungia horrida* Dana, 1846, Fig. 17

Synonym

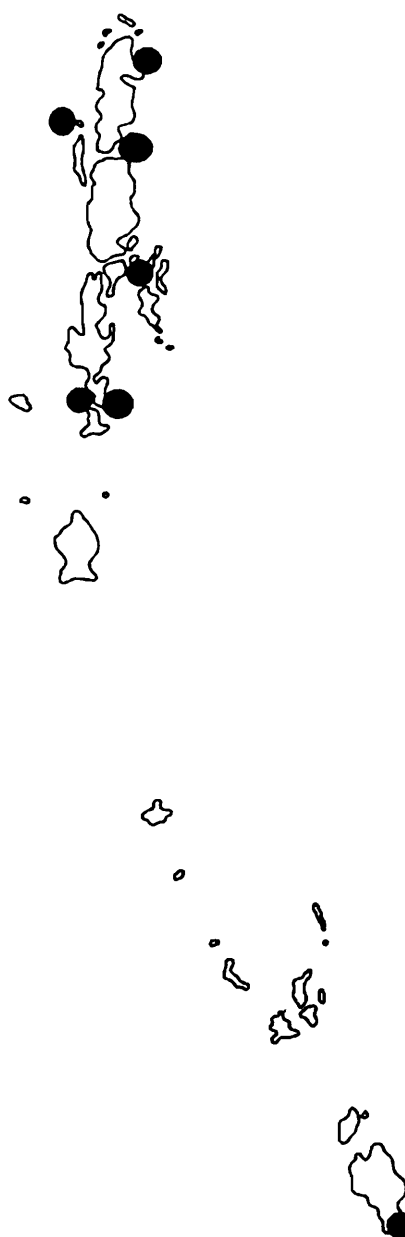
Fungia acutidens Studer, 1877

Taxonomic references

Dana, J.D. 1846. Zoophytes. United States Exploring Expedition during the years 1831-1842 under the command of Charles Wilkes, 8 : 1-740. Lea and Blanchard. -Philadelphia.

Veron J.E.N. and Pichon, M. 1980. Scleractinia of Eastern Australia. Part 3, Families Agariciidae, Siderasteridae, Fungiidae, Oculinidae, Merulinidae, Mussidae, Pectiniidae, Caryophylliidae, Dendrophylliidae. *Australian Inst. Mar. Sci. Monogr. Ser.*, IV : 1-471.

Hoekesma, B.W. 1989. Systematics and ecology of mushroom corals (Scleractinia : Fungiidae). *Zool Verhandelingen*, 254 : 1-471.



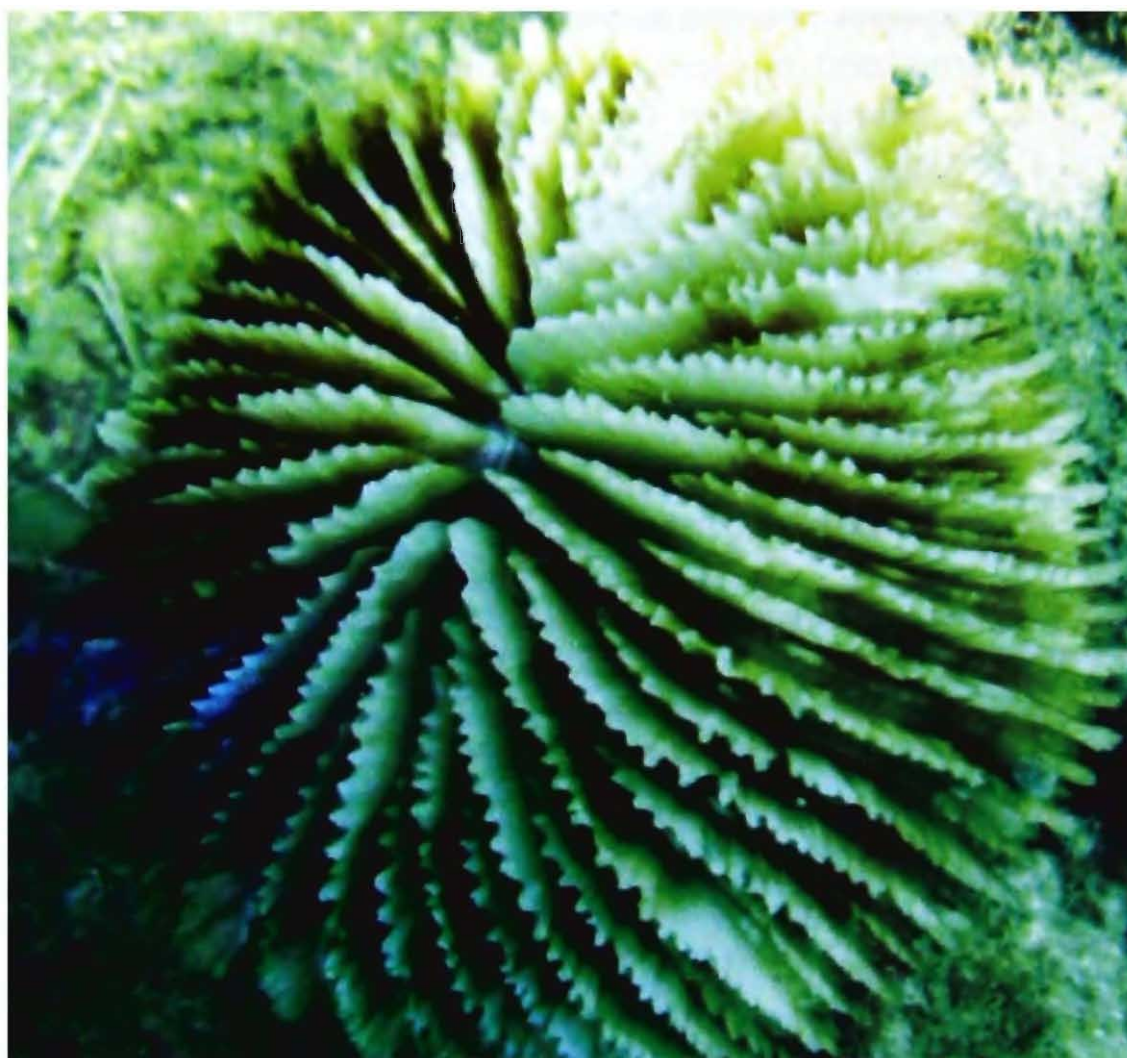


Fig. 17. *Fungia horrida* Dana, 1846

Cairns, S.D. 1991. Catalog of the type specimens of stony corals (Milleporidae, Stylasteridae, Scleractinia) in the National Museum of Natural History, Smithsonian Institution. *Smithsonian Contributions to Zoology*, 514 : 1-59.

Cairns, S.D., Hoeksema, B.W. and van der Land, J. 1999. List of extant stony corals. Appendix (pp. 13-46) in S.D. Cairns, Species richness of Recent Scleractinia. *Atoll Research Bulletin*. 459 : 1-46.

Veron, J.E.N. 2000. *Corals of the world*. 3 vols. Australian Institute of Marine Science and CRR Qld. Pty. Ltd.

Description : Polyps are circular, up to 200 millimetres in diameter and thick, with a strong central arch. Septa are straight, with very large irregular teeth. Tentacular lobes are weakly developed. Costae are unequal, with very long spines. There are no pits between the costae.

Colour : Usually brown commonly with radiating tips or mottled.

Similar species : *Fungia danai*, *Fungia corona*, which does not have a central arch and has simple costal spines.

Occurrence : Common

Material Examined : Eighteen specimens were examined. The diameter of largest specimen is 19.2 cm and the smallest one is 5.1 cm.

Distribution : India : Andaman and Nicobar Islands (Avis Island, Sound Island, Rail Island, Smith Island, Ross Island, North Reef Island, Rutland Island, Jolly Bouy Island, Pongibalu, North Bay and Ritchie's Archipelago)

Elsewhere : American Samoa, Australia, British Indian Ocean Territory, Cook Islands, Djibouti, Egypt, Fiji, French Polynesia, India, Indonesia, Israel, Japan, Jordan, Kiribati, Madagascar, Malaysia, Marshall Islands, Mozambique, New Caledonia, Palau, Papua New Guinea, Philippines, Samoa, Saudi Arabia, Seychelles, Singapore, Solomon Islands, Sudan, Taiwan, Province of China, Tonga, United Republic of Tanzania, Vanuatu and Viet Nam.

IUCN Red List Category and Criteria : Least Concern.

18. *Fungia klunzingeri* Doderlein, 1901, Fig. 18**Taxonomic references**

- Döderlein, L. 1901. Die Korallen-Gattung *Fungia*. *Zoologische Anzeiger*, **24** : 353-360.
- Veron J.E.N. and Pichon, M. 1980. Scleractinia of Eastern Australia. Part 3, Families Agariciidae, Siderasteridae, Fungiidae, Oculinidae, Merulinidae, Mussidae, Pectiniidae, Caryophylliidae, Dendrophylliidae. *Australian Inst. Mar. Sci. Monogr. Ser.*, **IV** : 1-471.
- Veron, J.E.N. 2000. *Corals of the world*. 3 vols. Australian Institute of Marine Science and CRR Qld. Pty. Ltd.

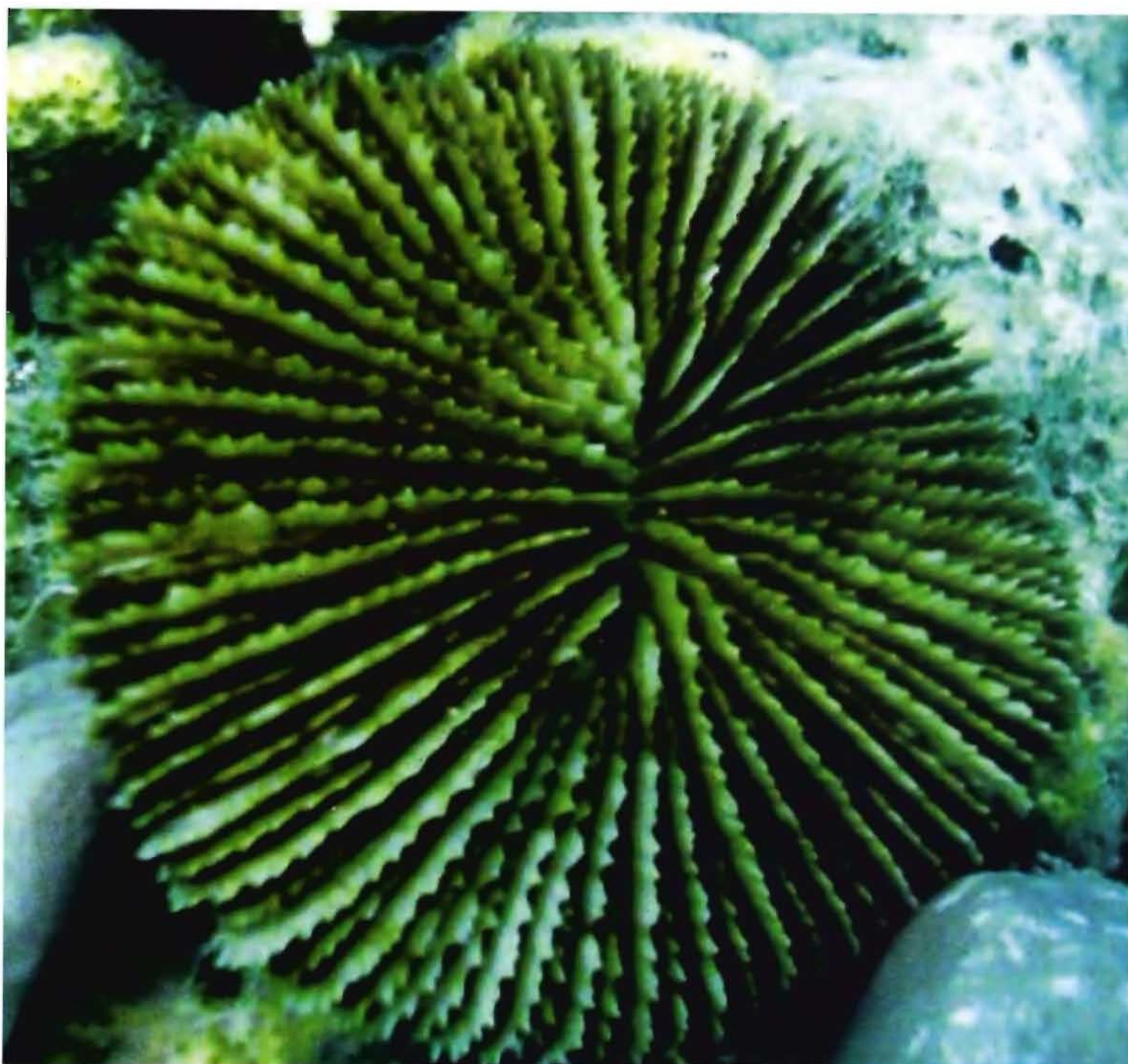


Fig. 18. *Fungia klunzingeri* Doderlein, 1901

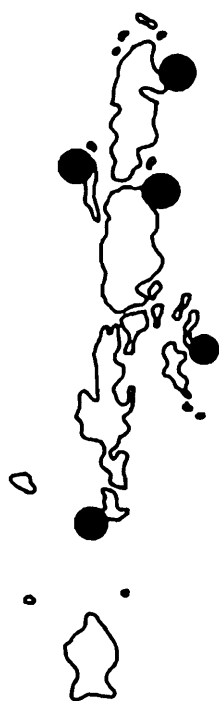
Description : Polyps are circular, up to 200 millimetres diameter and flat with a central dome. Septa are markedly different sizes and have large triangular to columnar teeth with a central rib and which form a regular pattern. Tentacular lobes are usually not developed. Costae are widely spaced, the larger having simple spines. The undersurface has pits between the costae.

Colour : Brown, sometimes with radiating stripes, with white tentacular lobes.

Similar species : *Fungia horrida*, which does not have regular triangular septal teeth.

Occurrence : Common.

Material Examined : Twenty one specimens were examined. The diameter of largest specimen is 18.3 cm and the smallest one is 3.5 cm.



Distribution : India : Andaman and Nicobar Islands (Avis Island, Sound Island, Rail Island, Smith Island, Ross Island, North Reef Island, Rutland Island Ritchie's Archipelago)

Elsewhere : American Samoa, Australia, Egypt, Fiji, Indonesia, Jordan, Madagascar, Malaysia, Papua New Guinea, Solomon Islands, Tonga, United Republic of Tanzania, Vanuatu and Viet Nam.

IUCN Red List Category and Criteria : No entries found.

19. *Fungia fungites* (Linnaeus, 1758), 1901, Fig. 19

Synonyms

Fungia agariciformis Lamarck, 1801.

Fungia pliculosa Studer, 1877.

Fungia lacera Verrill, 1866.

Fungia dentata Dana, 1846.

Fungia patella (Ellis and Solander, 1786).

Fungia patellaris Lamarck, 1801.

Fungia crassolamellata Milne Edwards and Haime, 1851.

Fungia haimei Verrill, 1864.

Fungia confertifolia Dana, 1846.

Fungia papillosa Verrill, 1866.

Monomyces patella (Ellis and Solander, 1786).

Madrepora patella Ellis and Solander, 1786.

Madrepora fungites Linnaeus, 1758.



Fig. 19. *Fungia fungites* (Linnaeus, 1758)

Taxonomic references

- Linnaeus, C. 1758. *Systema naturae*. Edition 10. *Laurentii Salvii*. –Holmiae.
- Boschma, H. 1923. The Madreporaria of the Siboga Expedition, part 4 : *Fungia patella*. *Siboga- Expeditie Monogr.*, **96** (16d) : 129-148.
- Veron, J.E.N. and Pichon, M. 1980. Scleractinia of Eastern Australia. Part 3, Families Agariciidae, Siderasteridae, Fungiidae, Oculinidae, Merulinidae, Mussidae, Pectiniidae, Caryophylliidae, Dendrophylliidae. *Australian Inst. Mar. Sci. Monogr. Ser. IV* : 1- 471.
- Hoekesma, B.W. 1989. Systematics and ecology of mushroom corals (Scleractinia : Fungiidae). *Zool Verhandelingen* , **254** : 1-471.
- Cairns, S.D., Hoekesma, B.W. and van der Land, J. 1999. List of extant stony corals. Appendix (pp. 13-46) in S.D. Cairns, Species richness of Recent Scleractinia. *Atoll Research Bulletin*, **459** : 1-46.
- Veron, J.E.N. 2000. *Corals of the world*. 3 vols. *Australian Institute of Marine Science and CRR Qld. Pty. Ltd.*

Description : Polyps are approximately circular and up to 280 millimetres diameter. Septal teeth are triangular, pointed and usually have well defined central ribs. Tentacular lobes may be present. Costal spines are tall, smooth and conical.

Colour : Brown, sometimes mottled, often with pale tentacular lobes.

Similar species : *Fungia repanda*, which has finer septal teeth.

Occurrence : Common.

Material Examined : Forty four specimens were examined. The diameter of largest specimen is 27.3 cm and the smallest one is 5.5 cm.

Distribution : India : Andaman and Nicobar Islands (Avis Island, Sound Island, Rail Island, Smith Island, Ross Island, North Reef Island, Interview Island, Rutland Island, Grub Island, Jolly Bouy Island, Pongibalu, North Bay Island, Great Nicobar Island and Ritchie's Archipelago) and Lakshadweep Islands



Elsewhere : American Samoa, Australia, British Indian Ocean Territory, China, Christmas Island, Cocos (Keeling) Islands, Cook Islands, Djibouti, Egypt, Fiji, French Polynesia, Guam, Indonesia, Iran (Islamic Republic of), Israel, Japan, Jordan, Kenya, Kiribati, Madagascar, Malaysia, Maldives, Marshall Islands, Mauritius, Micronesia (Federated States of), Mozambique, Myanmar, New Caledonia, Palau, Papua New Guinea, Philippines, Réunion, Samoa, Saudi Arabia, Seychelles, Singapore, Solomon Islands, Somalia, Sri Lanka, Sudan, Taiwan, Province of China, Thailand, Timor-Leste, Tonga, United Republic of Tanzania, United States Minor Outlying Islands, United States of America, Vanuatu and Viet Nam.

IUCN Red List Category and Criteria : Near Threatened.

20. *Fungia concinna* Verrill, 1864, 1901, Fig. 20

Synonyms

Fungia serrulata Verrill, 1864

Fungia plana (Studer, 1877)

Cycloseris sinuosa Nemenzo, 1983

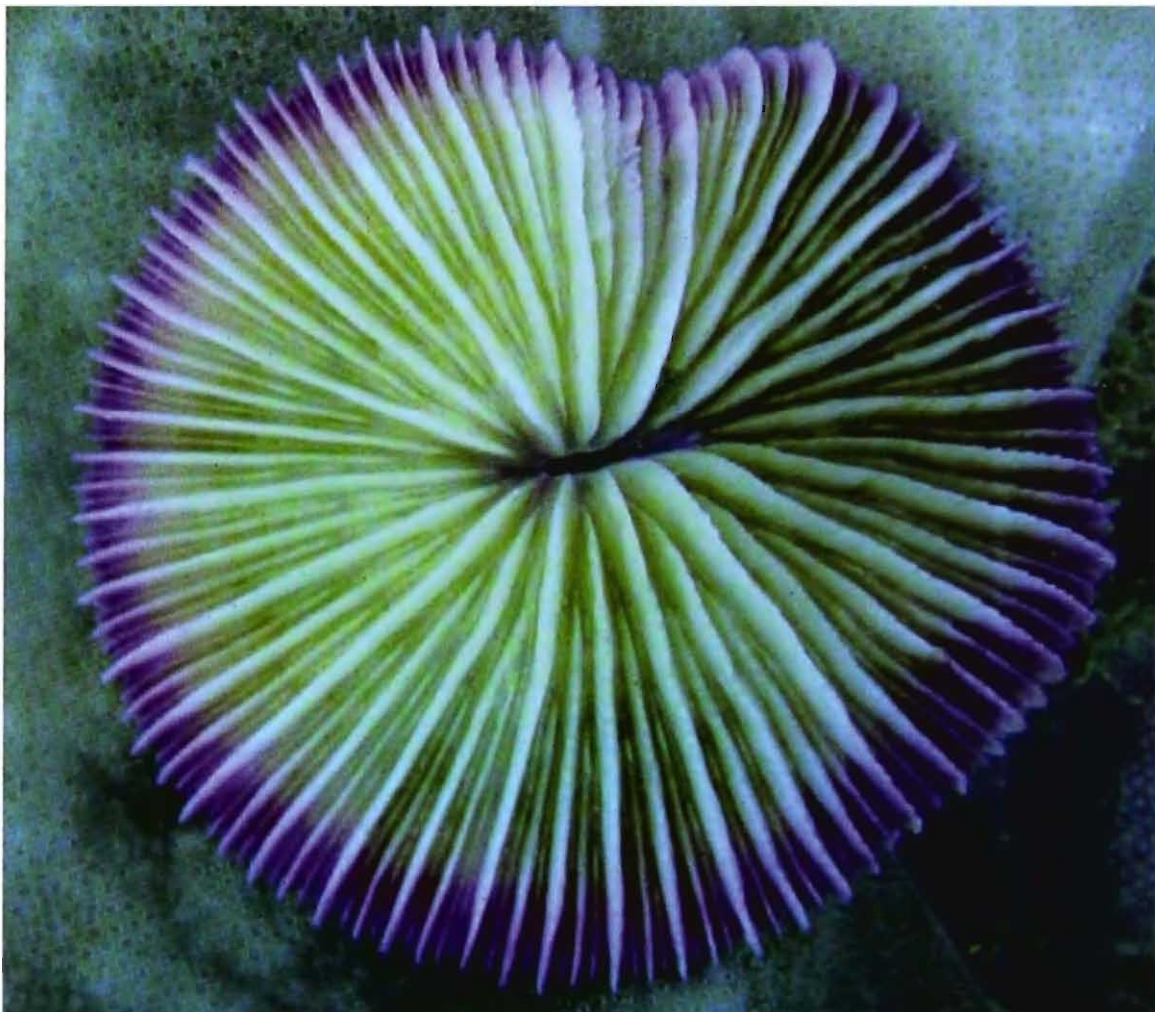


Fig. 20. *Fungia concinna* Verrill, 1864

Taxonomic references

- Verrill, A.E. 1864. List of the polyps and corals sent by the Museum of Comparative Zoology to other institutions in exchange, with annotations. *Bulletin of the Museum of Comparative Zoology*, 1(3) : 29-60.
- Cairns, S.D., Hoeksema, B.W. and van der Land, J. 1999. List of extant stony corals. Appendix (pp. 13-46) in S.D. Cairns, Species richness of Recent Scleractinia. *Atoll Research Bulletin*, 459 : 1-46.
- Veron, J.E.N. 2000. Corals of the world. 3 vols. *Australian Institute of Marine Science and CRR Qld. Pty. Ltd.*

Description Polyps are circular, up to 160 millimetres diameter and generally flat. Septa are densely packed. Septal teeth and costal spines are small, giving septa a smooth appearance. Tentacular lobes are not formed or are minute. The undersurface is usually without pits.

Colour : Usually brown, sometimes with a contrasting perimeter.

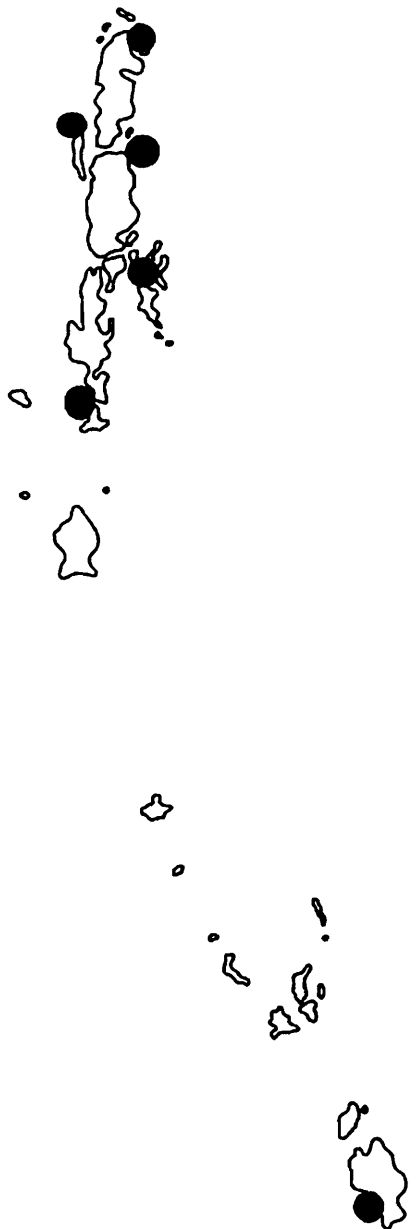
Similar species : *Fungia repanda*, which has coarser septal teeth, pits between the coastae and usually more arched, *Fungia scabra*, *Fungia spinifer*.

Occurrence : Common.

Material Examined : Thirty five specimens were examined. The diameter of largest specimen is 14.1 cm and the smallest one is 3.1 cm.

Distribution : India : Andaman and Nicobar Islands (Avis Island, Sound Island, Rail Island, Smith Island, Ross Island, North Reef Island, Interview Island, Rutland Island, Grub Island, Jolly Bouy Island, Pongibalu, North Bay Island, Great Nicobar Island and Ritchie's Archipelago).

Elsewhere : American Samoa, Australia, British Indian Ocean Territory, China, Cocos (Keeling) Islands, Cook Islands, Djibouti, Egypt, Fiji, French Polynesia, Guam, India, Indonesia, Japan, Kiribati, Madagascar, Malaysia, Marshall Islands, Mauritius, Micronesia (Federated States of),



Mozambique, New Caledonia, Palau, Papua New Guinea, Philippines, Samoa, Seychelles, Singapore, Solomon Islands, Sudan, Taiwan, Province of China, Thailand, Tonga, United Republic of Tanzania, United States Minor Outlying Islands, United States of America, Vanuatu and Viet Nam.

IUCN Red List Category and Criteria : Least Concern.

21. *Fungia fralinae* Nemenzo, 1955, Fig. 21

Synonym

Cycloseris similis Nemenzo, 1976.

Taxonomic references

Nemenzo, F. 1955. Systematic studies on Philippine shallow water scleractinians. I. Suborder Fungiida. *Nat. Appl. Sci. Bull.*, **15** : 3-84.

Hoekesma, B.W. 1989. *Systematics and ecology of mushroom corals (Scleractinia : Fungiidae)*. *Zool Verhandelingen*, **254** : 1-471.

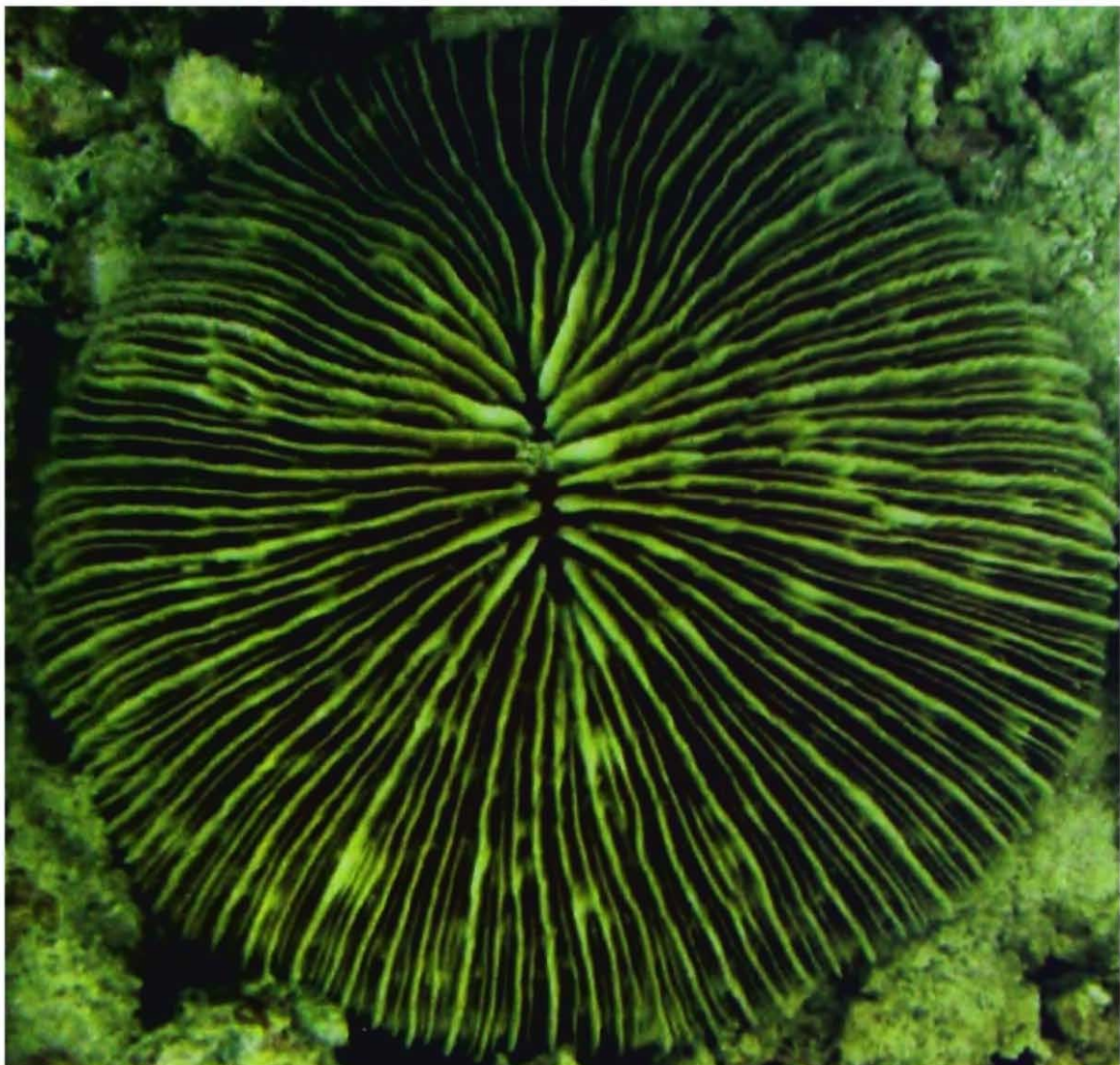


Fig. 21. *Fungia fralinae* Nemenzo, 1955

Cairns, S.D., Hoeksema, B.W. and van der Land, J. 1999. List of extant stony corals. Appendix (pp. 13-46) in S.D. Cairns, Species richness of Recent Scleractinia. *Atoll Research Bulletin*, **459** : 1-46.

Veron, J.E.N. 2000. *Corals of the world*. 3 vols. Australian Institute of Marine Science and CRR Qld. Pty. Ltd.

Description : Polyps are circular. Septa are in two distinct orders, those of the first order being very exsert, straight and thin. All septa have fine teeth. Tentacles, which are sometimes bifurcated, are commonly extended during the day.

Colour : Polyps are usually olive-green with tiny but conspicuous violet tentacle tips.

Similar species : The exsert alternating septa with fine teeth are distinctive.

Occurrence : Uncommon.

Material Examined : One specimen was examined. The diameter of of the specimen was 8.6 cm.

Distribution : India : Andaman and Nicobar Islands (North Bay)

Elsewhere : Australia, Indonesia, Kiribati, Papua New Guinea, Philippines, Solomon Islands and Viet Nam.

IUCN Red List Category and Criteria : Least Concern.



22. *Fungia repanda* Dana, 1846, Fig. 22

Synonyms

Fungia integra Dana, 1846.

Fungia linnaei Milne Edwards and Haime, 1851.

Fungia samboangensis Vaughan, 1906.

Verrillofungia repanda (Dana, 1846).

Taxonomic references

- Dana, J.D. 1846. Zoophytes. *United States Exploring Expedition during the years 1831-1842 under the command of Charles Wilkes*, 8 : 1-740. Lea and Blanchard. -Philadelphia.
- Veron, J.E.N. and Pichon, M. 1980. Scleractinia of Eastern Australia. Part 3, Families Agariciidae, Siderasteridae, Fungiidae, Oculinidae, Merulinidae, Mussidae, Pectiniidae, Caryophylliidae, Dendrophylliidae. *Australian Inst. Mar. Sci. Monogr. Ser.*, IV : 1-479.
- Hoekesma, B.W. 1989. Systematics and ecology of mushroom corals (Scleractinia : Fungiidae). *Zool. Verhandelingen*, 254 : 1-471.
- Cairns, S.D. 1991. Catalog of the type specimens of stony corals (Milleporidae, Stylasteridae, Scleractinia) in the National Museum of Natural History, Smithsonian Institution. *Smithsonian Contributions to Zoology*, 514 : 1-59.



Fig. 22. *Fungia repanda* Dana, 1846

Cairns, S.D., Hoeksema, B.W. and van der Land, J. 1999. List of extant stony corals. Appendix (pp. 13-46) in S.D. Cairns, Species richness of Recent Scleractinia. *Atoll Research Bulletin*, 459 : 1- 46.

Veron, J.E.N. 2000. *Corals of the world*. 3 vols. Australian Institute of Marine Science and CRR Qld. Pty. Ltd.

Description : Polyps are circular, up to 300 millimetres diameter, thick and flat or strongly arched. Septa are all most equal at the polyp perimeter. Septal teeth are fine but clearly visible. There are no tentacular lobes the undersurface has pits between the costae. Costal spines are granular. Tentacles are usually slightly extended during the day giving the polyp a speckled appearance.

Colour : Usually brown with pale tentacles.

Similar species : *Fungia scabra*, which has finer septal teeth, *Fungia concinna* and *Fungia fungities*.

Occurrence : Common.

Material Examined : Twenty nine specimens were examined. The diameter of the largest specimen is 8.6 cm while the smaller one showed 3.9 cm.

Distribution : India : Andaman and Nicobar Islands (Avis Island, Sound Island, Rail Island, Smith Island, Ross Island, North Reef Island, Interview Island, Rutland Island, Grub Island, Jolly Bouy Island, Pongibalu, North Bay Island, Great Nicobar Island and Ritchie's Archipelago).

Elsewhere : American Samoa, Australia, British Indian Ocean Territory, China, Christmas Island, Djibouti, Fiji, French Polynesia, India, Indonesia, Japan, Kiribati, Madagascar, Malaysia, Maldives, Marshall Islands, Mauritius, Micronesia (Federated States of), New Caledonia, Palau, Papua New Guinea, Philippines, Samoa, Saudi Arabia, Seychelles, Singapore, Solomon Islands, Sri Lanka, Taiwan, Province of China, Thailand, Tonga, Tuvalu, United Republic of Tanzania, United States Minor Outlying Islands, Vanuatu and Viet Nam.

IUCN Red List Category and Criteria : Least Concern.



23. *Fungia scabra* (Döderlein, 1901), Fig. 23

Taxonomic references

Döderlein, L. 1901. Die Korallen-Gattung *Fungia*. *Zoologische Anzeiger*, **24** : 353-360.

Veron, J.E.N. and Pichon, M. 1980. Scleractinia of Eastern Australia. Part 3. Families Agariciidae, Siderasteridae, Fungiidae, Oculinidae, Merulinidae, Mussidae, Pectiniidae, Caryophylliidae, Dendrophylliidae. *Australian Inst. Mar. Sci. Monogr. Ser.*, **IV** : 1-479.

Hoekesma, B.W. 1989. Systematics and ecology of mushroom corals (Scleractinia : Fungiidae). *Zool Verhandelingen*, **254** : 1-471.

Cairns, S.D., Hoeksema, B.W. and van der Land, J. 1999. List of extant stony corals. Appendix (pp. 13-46) in S.D. Cairns, Species richness of Recent Scleractinia. *Atoll Research Bulletin*, **459** : 1-46.

Veron, J.E.N. 2000. *Corals of the world*. 3 vols. Australian Institute of Marine Science and CRR Qld. Pty. Ltd.

Description : Polyps are usually circular, flat or arched. Septa are thin with fine conical or granular teeth. Small tentacular lobes may be present.



Fig. 23. *Fungia scabra* (Döderlein, 1901)

Costae are fine. There are no pits between the costae. Septa may form irregular patterns in turbid environments.

Colour : Polyps are usually brown.

Similar species : *Fungia concinna*, which is thinner and has thicker septa with coarser septal and costal ornamentations.

Occurrence : Rare

Material Examined : Eight specimens were examined. The maximum length of the presently observed specimen is 8.5 cm.

Distribution : India : Andaman and Nicobar Islands (Ritchie's Archipelago, Grub Island and Rutland Island).

Elsewhere : Australia, China, Fiji, French Polynesia, Hong Kong, Indonesia, Japan, Madagascar, Malaysia, Papua New Guinea, Philippines, Seychelles, Singapore, Solomon Islands, United Republic of Tanzania and Viet Nam.

IUCN Red List Category and Criteria : Least Concern.



24. *Fungia spinifer* (Claereboudt and Hoeksema, 1987), Fig. 24

Taxonomic references

Claereboudt, M. and Hoeksema, B.W. 1987. *Fungia* (Verrillofungia) *spinifer* spec. nov., a new scleractinian coral (Fungiidae) from Indo-Malayan region. *Zool. Mededelingen*, **61** : 303-309.

Hoeksema, B.W. 1989. Systematics and ecology of mushroom corals (Scleractinia : Fungiidae). *Zool Verhandelingen*, **254** : 1-471.

Cairns, S.D., Hoeksema, B.W. and van der Land, J. 1999. List of extant stony corals. Appendix (pp. 13-46) in S.D. Cairns, Species richness of Recent Scleractinia. *Atoll Research Bulletin*, **459** : 1- 46.

Veron, J.E.N. 2000. Corals of the world. 3 vols. *Australian Institute of Marine Science and CRR Qld. Pty. Ltd.*



Fig. 24. *Fungia spinifer* (Claereboudt and Hoeksema, 1987)

Description : Polyps are circular, up to 125 millimetres diameter, with a distinct central arch. Septa are densely packed and straight and have fine teeth and granulated sides.

Colour : Brown to greyish-violet.

Similar species : Septa are similar to those of *Fungia scabra* but are thinner and more exsert. Costae are *Cycloseris* like.

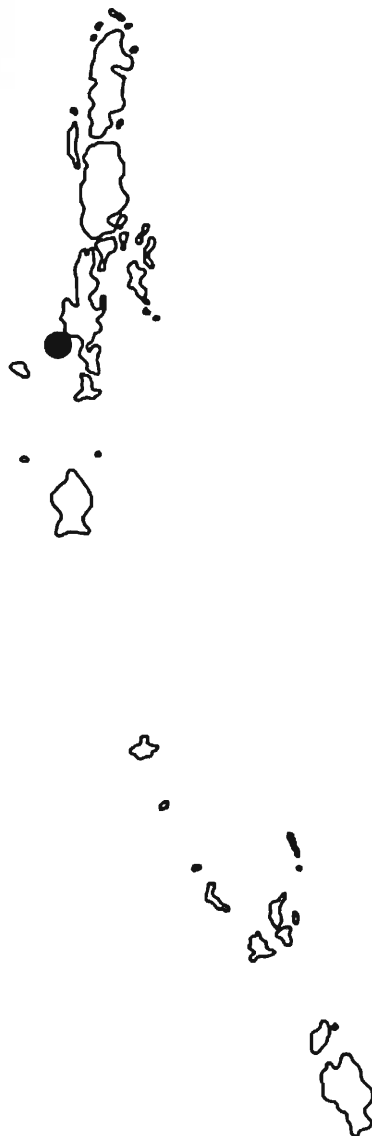
Occurrence : Uncommon.

Material Examined : One specimen was examined with a diameter 10.4 cm.

Distribution : India : Andaman and Nicobar Islands (Tarmugli Island)

Elsewhere : Fiji, Guam, Indonesia, Japan, Palau, Papua New Guinea, Philippines, Solomon Islands and Viet Nam.

IUCN Red List Category and Criteria : Least Concern.



25. *Fungia granulosa* Klunzinger, 1879, Fig. 25

Taxonomic references

- Klunzinger, C.B. 1879. Die Korallthiere des Rothen Meeres. 2 : Die Steinkorallen. 2. Die Astraeaceen und Fungiaceen. Gutmann. –Berlin.
- Veron, J.E.N. and Pichon, M. 1980. Scleractinia of Eastern Australia. Part 3, Families Agariciidae, Siderasteridae, Fungiidae, Oculinidae, Merulinidae, Mussidae, Pectiniidae, Caryophylliidae, Dendrophylliidae. *Australian Inst. Mar. Sci. Monogr. Ser., IV* : 1-471.
- Hoekesma, B.W. 1989. Systematics and ecology of mushroom corals (Scleractinia : Fungiidae). *Zool Verhandelingen*, **254** : 1-471.
- Cairns, S. D., Hoeksema, B.W. and van der Land, J. 1999. List of extant stony corals. Appendix (pp. 13-46) in S.D. Cairns, Species richness of Recent Scleractinia. *Atoll Research Bulletin*, **459** : 1- 46.
- Veron, J.E.N. 2000 *Corals of the world*. 3 vols. *Australian Institute of Marine Science and CRR Qld. Pty. Ltd.*



Fig. 25. *Fungia granulosa* Klunzinger, 1879

Description Polyps are circular, up to 135 millimetres diameter and flat or with a central arch. Septa are thick and wavy, with finely granulated margins. Tentacular lobes are wide, causing the wavy shape of the septa. Costae are fine. The undersurface has pits between the costae.

Colour Usually brown.

Similar species *Fungia scabra* and *Cycloseris costulata*.

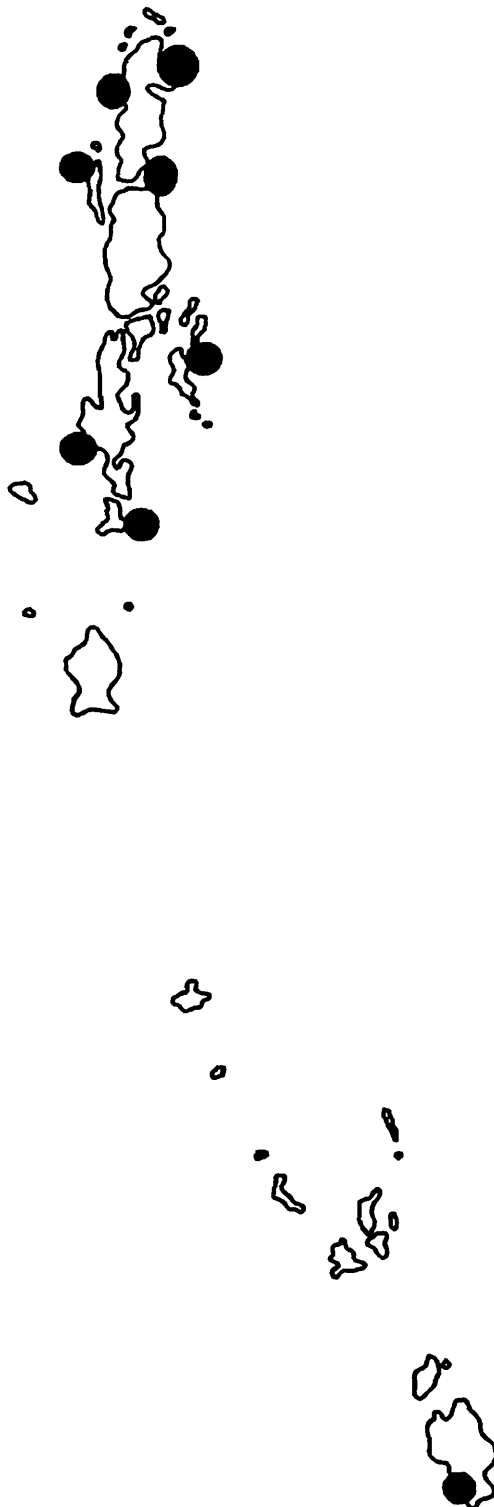
Occurrence Uncommon.

Material Examined Nineteen specimens were examined. The diameter of the largest specimen ranged from 5.8 to 13.1 cm.

Distribution : India . Andaman and Nicobar Islands (Tarmugli Island, Avis Island, Sound Island, Rail Island, Smith Island, Ross Island, North Reef Island, Interview Island, Rutland Island, Grub Island, Jolly Bouy Island, Pongibalu, North Bay Island, Great Nicobar Island and Ritchie's Archipelago).

Elsewhere American Samoa, Australia, British Indian Ocean Territory, China, Christmas Island, Cocos (Keeling) Islands, Djibouti, Egypt, Fiji, French Polynesia, Guam, Indonesia, Israel, Japan, Jordan, Kiribati, Madagascar, Malaysia, Maldives, Mauritius, Palau, Papua New Guinea, Philippines, Saudi Arabia, Seychelles, Singapore, Solomon Islands, Sudan, Taiwan, Province of China, Thailand, Vanuatu and Viet Nam.

IUCN Red List Category and Criteria : Least Concern.



26. *Fungia taiwanensis* (Hoeksema and Dai, 1991), Fig. 26**Taxonomic references**

Hoeksema, B.W. and Dai, C.F. 1991. Scleractinia of Taiwan. II Family Fungiidae (including a new species). *Bull. Inst. Zool. Academia Sinica (Taipei)*, **30** : 203-228.

Cairns, S.D., Hoeksema, B.W. and van der Land, J. 1999. List of extant stony corals. Appendix (pp. 13-46) in S.D. Cairns. Species richness of Recent Scleractinia. *Atoll Research Bulletin*, **459** : 1- 46.

Veron, J.E.N. 2000. Corals of the world. 3 vols. *Australian Institute of Marine Science and CRR Qld. Pty. Ltd.*

Description : Coral outline irregularly oval. Oral surface strongly humped. Septa more or less straight, except around secondary mouths. Tentacular lobes usually absent. Septal dentations fine and sharp or varying from slightly lobate to ravel-shaped. Granulations on septal sides fine and evenly distributed. Aboral surface uneven. Detachment scar disappearing in adult stage. Costae irregularly shaped and unequal in size. Costal spines blunt and granular.

Colour : Brown with white tentacles.

Similar species : *Fungia moluccensis*, which has a smaller number of mouths and does not have white tentacles.



Fig. 26. *Fungia taiwanensis* (Hoeksema and Dai, 1991)



Occurrence : Uncommon

Material Examined : Two specimens were examined. The length of the largest specimen was 12.6 cm. and smaller one was 7.2 cm.

Distribution : India : Andaman and Nicobar Islands (Great Nicobar Island and Sound Island)

Elsewhere : Indonesia, Papua New Guinea, Philippines and Solomon Islands.

IUCN Red List Category and Criteria : Vulnerable.

27. *Fungia scutaria* Lamarck, 1801, Fig. 27**Synonyms**

Fungia oahensis Döderlein, 1901.

Fungia dentigera Leuckart, 1841.

Fungia tenuidens Quelch, 1886

Fungia placunaria Klunzinger, 1879

Fungia verrilliana Quelch, 1886

Lobactis conferta Verrill, 1864

Lobactis danae Verrill, 1864

Pleuractis scutaria (Lamarck, 1801)

Taxonomic references

Lamarck, J.B.P.A. de Monet de. 1801. Système des animaux sans vertèbres. Deterville. –Paris.

Veron, J.E.N. and Pichon, M. 1980. Scleractinia of Eastern Australia. Part 3, Families Agariciidae, Siderasteridae, Fungiidae, Oculinidae, Merulinidae, Mussidae, Pectiniidae, Caryophylliidae, Dendrophylliidae. *Australian Inst. Mar. Sci. Monogr. Ser.*, IV : 1-471.

Hoekesma, B.W. 1989. Systematics and ecology of mushroom corals (Scleractinia : Fungiidae). *Zool. Verhandelingen*, 254 : 1- 471

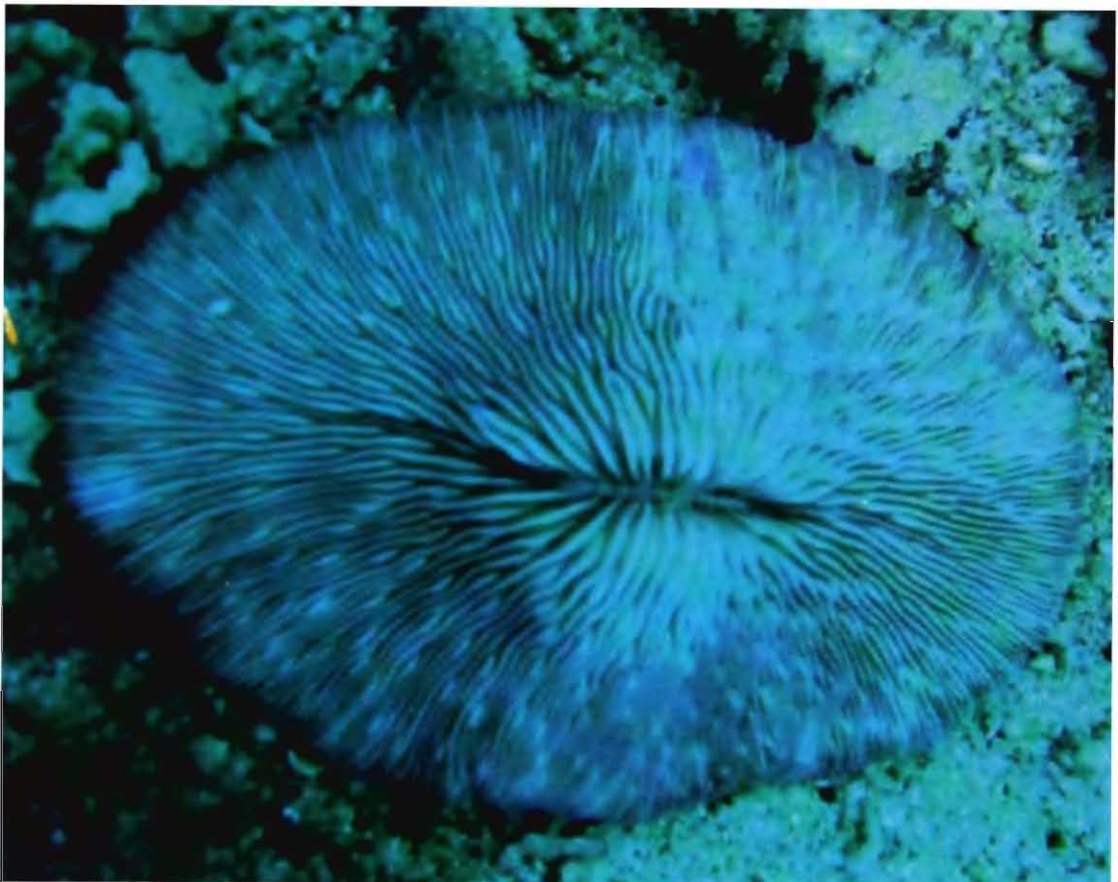


Fig. 27. *Fungia scutaria* Lamarck, 1801

Cairns, S.D., Hoeksema, B.W. and van der Land, J. 1999. List of extant stony corals. Appendix (pp. 13-46) in S.D. Cairns, Species richness of Recent Scleractinia. *Atoll Research Bulletin*, **459** : 1- 46.

Veron, J.E.N. 2000. Corals of the world. 3 vols. *Australian Institute of Marine Science and CRR Qld. Pty. Ltd.*

Description Polyps are oval, thick, heavy and up to 170 millimetres long. Primary septa commence with a tall tentacular lobe and these are distributed at regular intervals from the mouth to the perimeter.

Colour Brown, blue or yellow, often with bright green, blue or white tentacular lobes.

Similar species *Fungia seychellensis*.

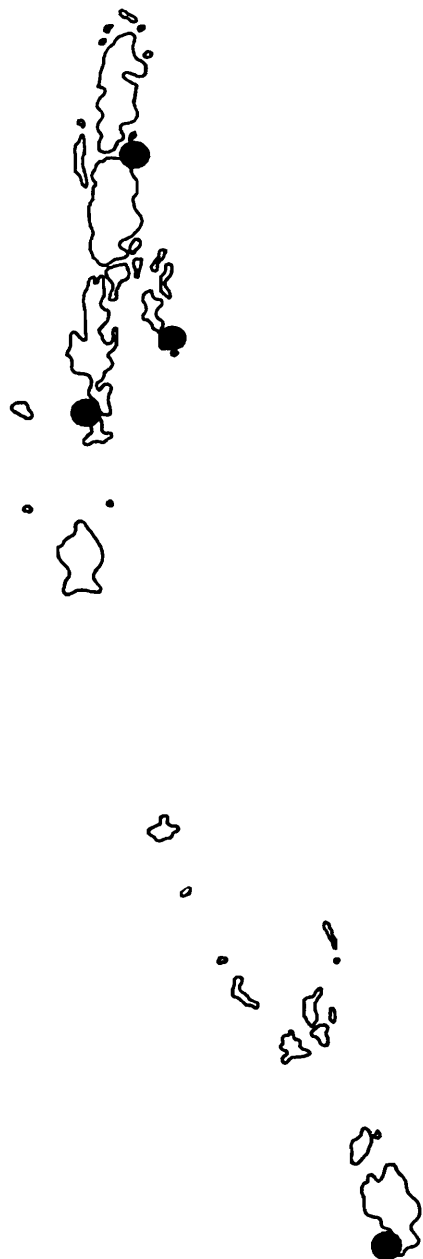
Occurrence Uncommon.

Material Examined Eleven specimens were examined. The length of the largest specimen was 14.8 cm while the small one measured 7.5 cm.

Distribution : India Andaman and Nicobar Islands (Ritchie's Archipelago, Grub Island, Great Nicobar Island and Sound Island) and Lakshadweep Islands.

Elsewhere : American Samoa, Australia, British Indian Ocean Territory, China, Christmas Island, Cocos (Keeling) Islands, Cook Islands, Djibouti, Egypt, Fiji, French Polynesia, Guam, India, Indonesia, Israel, Japan, Jordan, Kenya, Kiribati, Madagascar, Malaysia, Maldives, Marshall Islands, Mauritius, Micronesia (Federated States of), Mozambique, New Caledonia, Northern Mariana Islands, Palau, Papua New Guinea, Philippines, Pitcairn, Réunion, Samoa, Saudi Arabia, Seychelles, Singapore, Solomon Islands, South Africa, Sri Lanka, Sudan, Taiwan, Province of China, Thailand, Tokelau, Tonga, Tuvalu, United Republic of Tanzania, United States Minor Outlying Islands, United States of America, Vanuatu and Viet Nam.

IUCN Red List Category and Criteria :
Least Concern.



28. *Fungia paumotensis* Stutchbury, 1833, Fig. 28**Synonyms**

Fungia cacharias Studer, 1877.

Fungia proechinata Döderlein, 1901.

Taxonomic references

Stutchbury, S. 1833. An account of the mode of growth of young corals of the genus *Fungia*. *Transactions of the Linnean Society of London*, **16** : 493-498.

Veron, J.E.N. and Pichon, M. 1980. Scleractinia of Eastern Australia. Part 3, Families Agariciidae, Siderasteridae, Fungiidae, Oculinidae, Merulinidae, Mussidae, Pectiniidae, Caryophylliidae, Dendrophylliidae. *Australian Inst. Mar. Sci. Monogr. Ser.*, **IV** : 1-471.

Hoekesma, B.W. 1989. Systematics and ecology of mushroom corals (Scleractinia : Fungiidae). *Zool Verhandelingen*, **254** : 1-471.

Veron, J.E.N. and Hodgson, G. 1989. Annotated checklist of the hermatypic corals of the Philippines. *Pacific Sci.*, **43** : 234-287.

Cairns, S.D., Hoeksema, B.W. and van der Land, J. 1999. List of extant stony corals. Appendix (pp. 13-46) in S.D. Cairns, Species richness of Recent Scleractinia. *Atoll Research Bulletin*, **459** : 1-46.

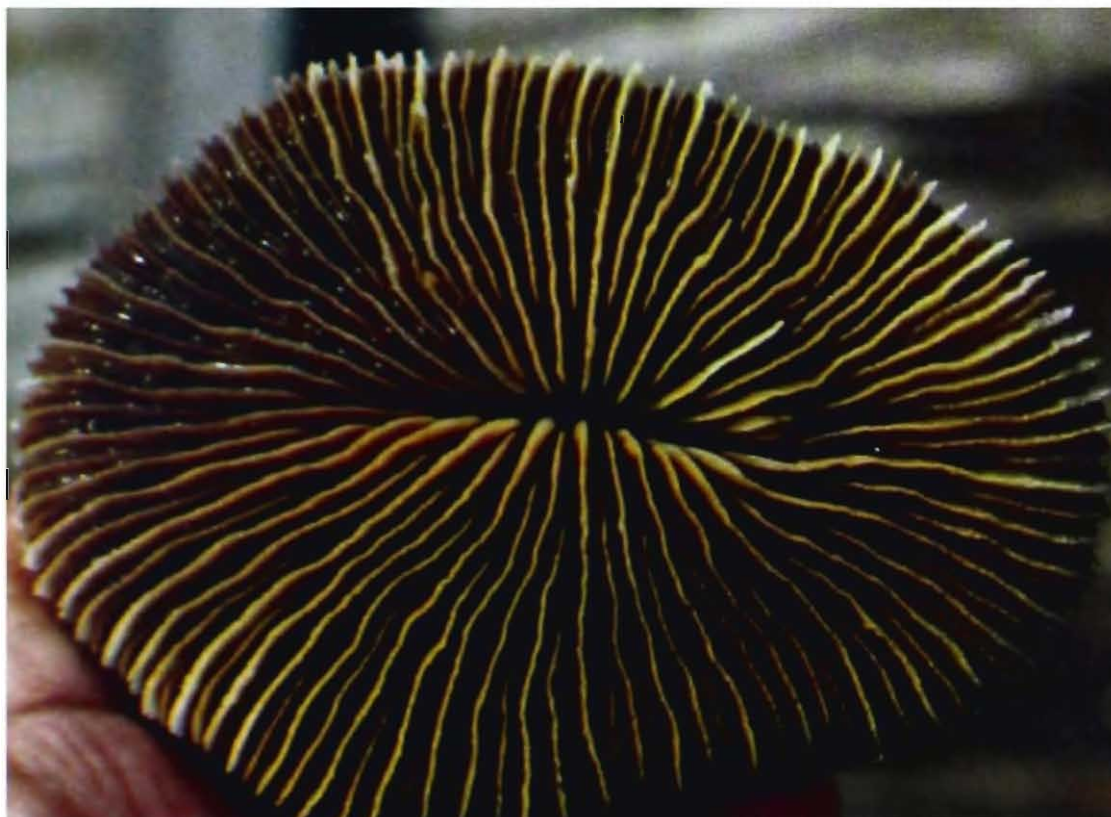


Fig. 28. *Fungia paumotensis* Stutchbury, 1833

Veron, J.E.N. 2000. Corals of the world. 3 vols. *Australian Institute of Marine Science and CRR Qld. Pty. Ltd.*

Description Polyps are elongate and up to 250 millimetres long with almost parallel sides. They are thick and heavy and usually have a strong central arch. Most primary septa extend from the mouth to the perimeter. Costae are fine and straight. There is no attachment scars except on immature specimens.

Colour Brown.

Similar species *Fungia moluccensis* and *Cycloseris somervillei*.

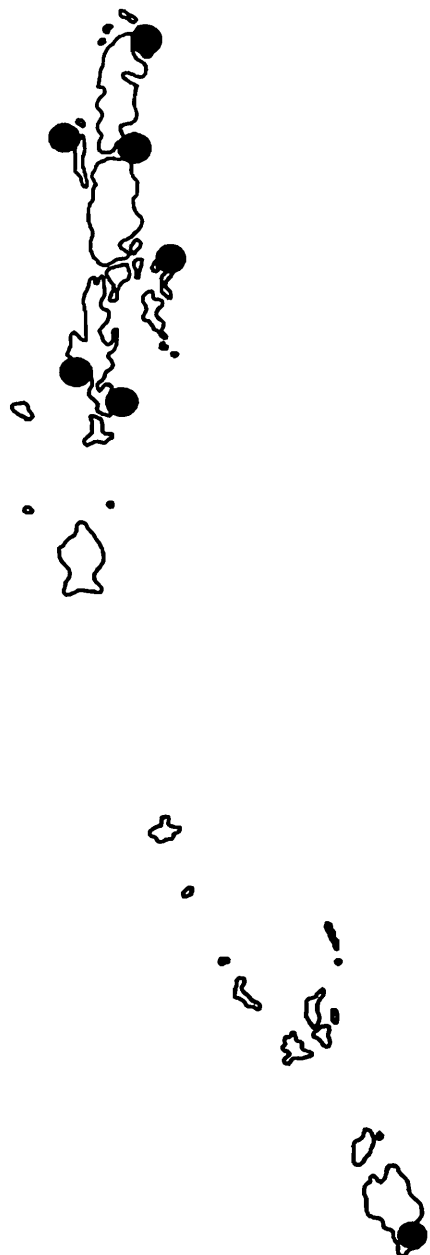
Occurrence : Common.

Material Examined : Twenty three specimens were examined. The length of the largest specimen was 20.6 cm and smallest one was 6.8 cm.

Distribution : India : Andaman and Nicobar Islands (Tarmugli Island, Avis Island, Sound Island, Rail Island, Smith Island, Ross Island, North Reef Island, Interview Island, Rutland Island, Grub Island, Jolly Bouy Island, Pongibalu, North Bay Island, Great Nicobar Island, Ritchie's Archipelago)

Elsewhere : American Samoa, Australia, Comoros, Cook Islands, Fiji, French Polynesia, Guam, Indonesia, Japan, Jordan, Kiribati, Madagascar, Malaysia, Maldives, Marshall Islands, Micronesia (Federated States of), Palau, Papua New Guinea, Philippines, Réunion, Saudi Arabia, Seychelles, Singapore, Solomon Islands, Taiwan, Province of China, Thailand, Tonga, United States Minor Outlying Islands, United States of America, Vanuatu and Viet Nam.

IUCN Red List Category and Criteria :
Least Concern.



29. *Fungia moluccensis* Horst, 1919, Fig. 29

Taxonomic references

- Horst, C.J. van der. 1919. A new species of *Fungia*. *Zoologische Mededelingen*, **5** : 65-66.
- Veron, J.E.N. and Pichon, M. 1980. Scleractinia of Eastern Australia. Part 3, Families Agariciidae, Siderasteridae, Fungiidae, Oculinidae, Merulinidae, Mussidae, Pectiniidae, Caryophylliidae, Dendrophylliidae. *Australian Inst. Mar. Sci. Monogr. Ser. IV* : 1-471.
- Hoekesma, B.W. 1989. Systematics and ecology of mushroom corals (Scleractinia : Fungiidae). *Zool Verhandelingen*, **254** : 1-471.
- Cairns, S. D., Hoeksema, B.W. and van der Land, J. 1999. List of extant stony corals. Appendix (pp. 13-46) in S.D. Cairns, Species richness of Recent Scleractinia. *Atoll Research Bulletin*, **459** : 1-46.
- Veron, J.E.N. 2000. Corals of the world. 3 vols. *Australian Institute of Marine Science and CRR Qld. Pty. Ltd.*

Description : Polyps are usually attached to, or encrust, the substrate. They may be shaped like *Fungia paumotensis* but are commonly contorted. They usually have a strong central arch. Specimens are not contorted, primary septa extend from the mouth to the perimeter. Secondary mouths are sometimes formed. Costae are irregular. An attachment scar is usually prominent.



Fig. 29. *Fungia moluccensis* Horst, 1919

Colour : Brown, cream or mottled.

Similar species *Fungia paumotensis*, which is heavier, less irregular and has thicker septa and costae which are straight and uniform.

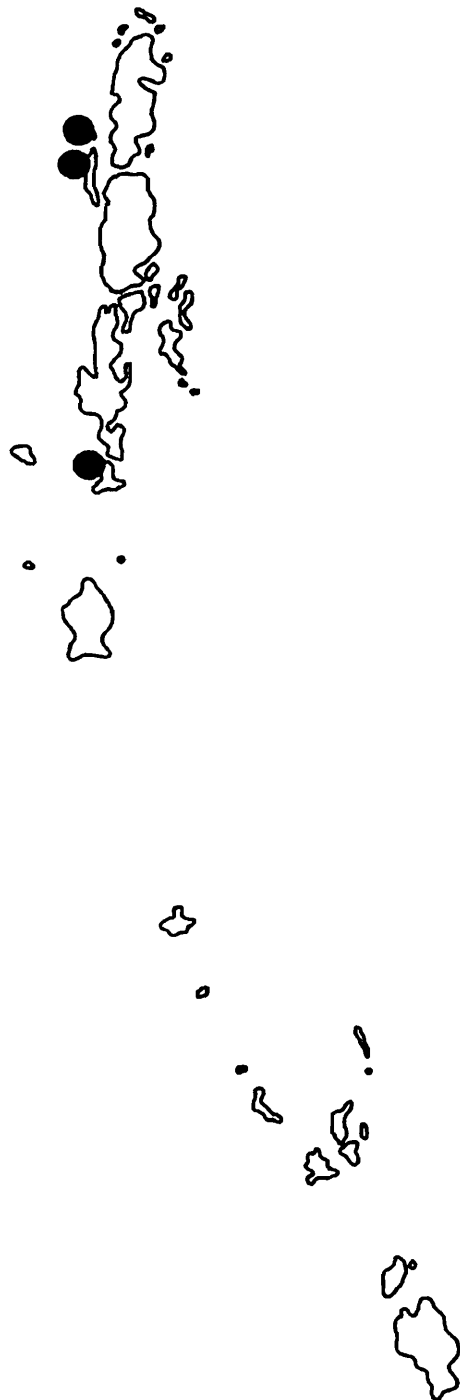
Occurrence Usually uncommon.

Material Examined : Five specimens were examined. The diameter of the largest specimen was 17.6 cm and smallest specimen was 9.2 cm.

Distribution India Andaman and Nicobar Islands (Rutland Island, North Reef Island and Interview Island).

Elsewhere Australia, Egypt, Fiji, French Polynesia, Indonesia, Israel, Japan, Jordan, Madagascar, Malaysia, New Caledonia, Palau, Papua New Guinea, Philippines, Samoa, Saudi Arabia, Seychelles, Singapore, Solomon Islands, Taiwan, Province of China, Thailand, Viet Nam and Yemen.

IUCN Red List Category and Criteria Least Concern.



30. *Fungia seychellensis* Hoeksema, 1993, Fig. 30

Taxonomic references

- Hoeksema, B.W. 1993. Historical biogeography of *Fungia* (*Pleuractis*) spp. (Scleractinia : Fungiidae), including a new species from the Seychelles. *Zoologische Mededelingen*, **67** : 639- 654.
- Cairns, S. D., Hoeksema, B.W. and van der Land, J. 1999. List of extant stony corals. Appendix (pp. 13-46) in S.D. Cairns, Species richness of Recent Scleractinia. *Atoll Research Bulletin*, **459** : 1-46.
- Veron, J.E.N. 2000. Corals of the world. 3 vols. *Australian Institute of Marine Science and CRR Qld. Pty. Ltd.*

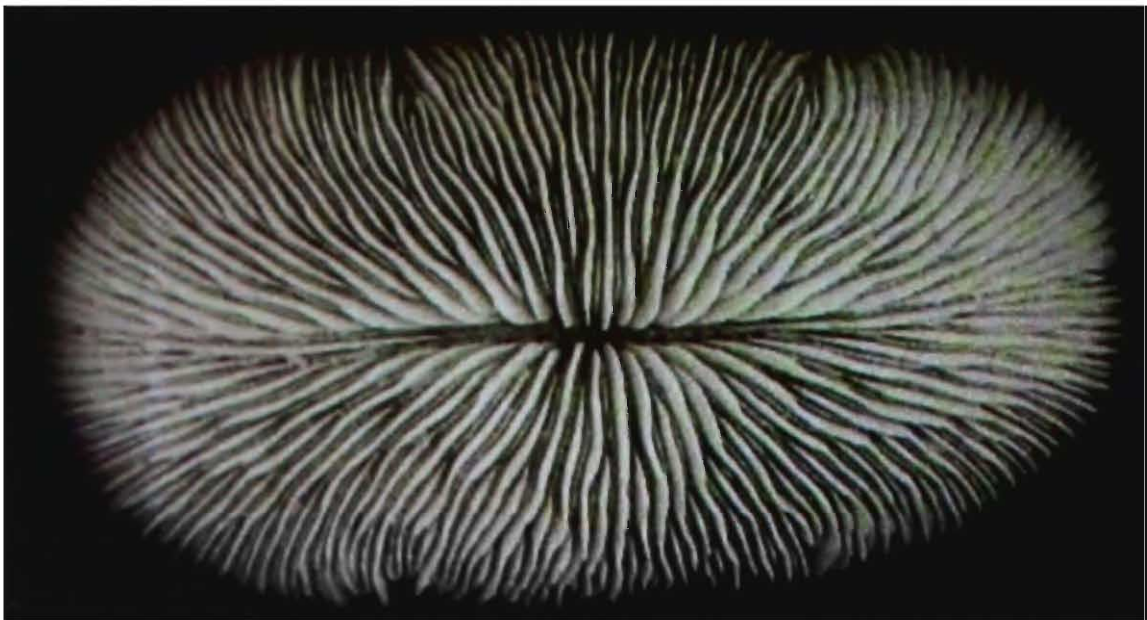


Fig. 30. *Fungia seychellensis* Hoeksema, 1993

Description : Polyps are circular to elongate and up to 150 millimetres long. Mouths may occur outside the axial furrow. Septa are fine, densely packed and usually sinuous. Tentacular lobes are inconspicuous or absent.

Colour : Pale brown.

Similar species : *Fungia scutaria*, which has distinct tentacular lobes and coarser septa

Occurrence : Rare

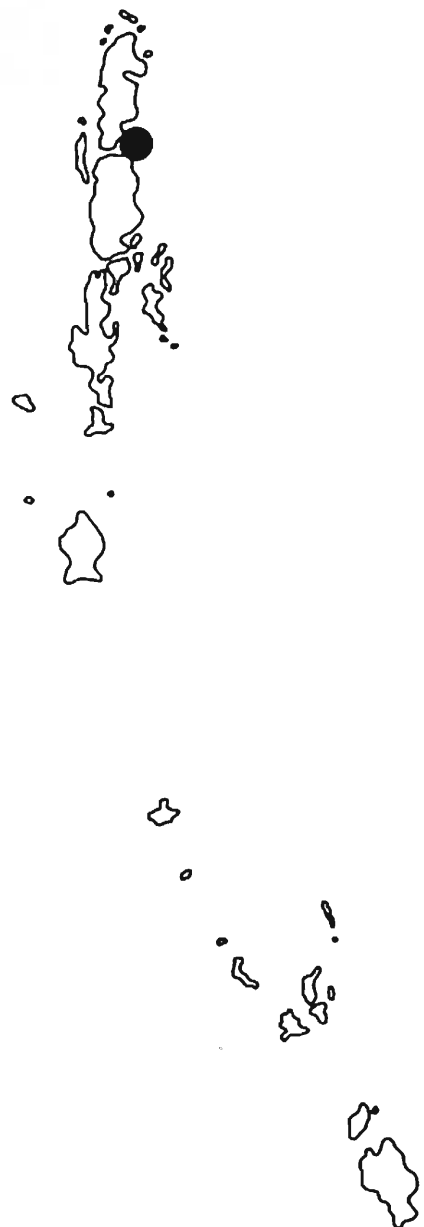
Material Examined : One material was examined. The length of the specimen was 12.3 cm.

Place of Record Andaman and Nicobar Islands : Sound Island.

Distribution : India : Andaman and Nicobar Islands (Sound Island)

Elsewhere : Madagascar, Seychelles.

IUCN Red List Category and Criteria : Vulnerable.



Genus *Ctenactis* Verrill, 1864

Taxonomic references

- Scheer, G. and Pillai, C.G.S. 1983. Report on the stony corals from the Red Sea. *Zoologica* (Stuttgart), **133** : 1-99.
- Hoekesma, B.W. 1989. Systematics and ecology of mushroom corals (Scleractinia : Fungiidae). *Zool. Verhandelingen*, **254** : 1-471.
- Veron, J.E.N. 2000. Corals of the world. 3 vols. *Australian Institute of Marine Science and CRR Qld. Pty. Ltd.*

Description : Polyps are elongate with a prominent central furrow which many have one to several mouths. Septa are neatly spaced and have large triangular evenly spaced teeth. Adults are free living and either mono or poly stomatous. Septal dentinations are coarse and either angular or rounded-lobate. The costal spines are relatively large and echinose.

Similar genera : *Fungia* and *Herpolitha*.

31. *Ctenactis echinata* (Pallas, 1766), Fig. 31

Synonyms

- Fungia pectinata* Ehrenberg, 1834.
- Fungia gigantea* Dana, 1846.
- Fungia echinata* (Pallas, 1766).
- Fungia ehrenbergii* (Leuckart, 1841).
- Fungia asperata* Dana, 1846.
- Herpetolithus ehrenbergii* Leuckart, 1841.
- Haloglossa echinata* (Pallas, 1766).
- Herpetolitha rueppellii* Leuckart, 1841.
- Madrepora echinata* Pallas, 1766.

Taxonomic references

- Pallas, P.S. 1766. Elenchus Zoophytorum. –La Hague.
- Veron, J.E.N. and Pichon, M. 1980. Scleractinia of Eastern Australia. Part 3, Families Agariciidae, Siderasteridae, Fungiidae, Oculinidae, Merulinidae, Mussidae, Pectiniidae, Caryophylliidae, Dendrophylliidae. *Australian Inst. Mar. Sci. Monogr. Ser.*, **IV** : 1-471.
- Hoekesma, B.W. 1989. Systematics and ecology of mushroom corals (Scleractinia : Fungiidae). *Zool Verhandelingen*, **254** : 1- 471.



Fig. 31. *Ctenactis echinata* (Pallas, 1766)

Cairns, S.D., Hoeksema, B.W. and van der Land, J. 1999. List of extant stony corals. Appendix (pp. 13-46) in S.D. Cairns, Species richness of Recent Scleractinia. *Atoll Research Bulletin*, **459** : 1-46.

Veron, J.E.N. 2000. Corals of the world. 3 vols. *Australian Institute of Marine Science and CRR Qld. Pty. Ltd.*

Description : Polyps are elongate. Septal teeth and costal spines are both strongly developed. Only a single mouth is present. Adults are free living. They are usually monostomatous. The septal edges along the sides of the groove stand upright whereas those at its ends diverge away from it. The septa are densely packed and either straight or slightly bending. The septa are low order cycles are thick and solid, those of higher orders thin and usually perforated. The corallum wall is perforated and covered by granulations.

Colour : Usually brown

Similar species : *Ctenactis crassa*, which has a series of mouths along the axial furrow, and *Ctenactis albitentaculata*.

Occurrence : Common

Material Examined : Twenty nine specimen of this species were examined. Largest specimen was 35.7 cm in length with a width of 18.1 cm

and the length of the axial furrow was 19.8 cm, whereas in the smallest one, these parameters were 3.7cm, 2.6 cm and 1.8 cm respectively.

Distribution : India : Andaman and Nicobar Islands (Tarmugli Island, Avis Island, Sound Island, Rail Island, Smith Island, Ross Island, North Reef Island, Interview Island, Rutland Island, Grub Island, Jolly Bouy Island, Pongibalu, North Bay Island, Great Nicobar Island and Ritchie's Archipelago).

Elsewhere : American Samoa, Australia, China, Cook Islands, Djibouti, Egypt, Fiji, French Polynesia, India, Indonesia, Israel, Japan, Jordan, Malaysia, Maldives, Marshall Islands, Myanmar, New Caledonia, Palau, Papua New Guinea, Philippines, Saudi Arabia, Singapore, Solomon Islands, Sri Lanka, Sudan, Taiwan, Province of China, Thailand, Tonga, United States of America, Vanuatu and Viet Nam.

IUCN Red List Category and Criteria :
Least Concern.

32. *Ctenactis albitentaculata* Hoeksema, 1989, Fig. 32

Taxonomic references

- Hoeksema, B.W. 1989. Systematics and ecology of mushroom corals (Scleractinia : Fungiidae). *Zool Verhandelingen*, **254** : 1-471
- Cairns, S.D., Hoeksema, B.W. and van der Land, J. 1999. List of extant stony corals. Appendix (pp. 13-46) in S.D. Cairns, Species richness of Recent Scleractinia. *Atoll Research Bulletin*, **459** : 1-46.
- Veron, J.E.N. 2000. Corals of the world. 3 vols. *Australian Institute of Marine Science and CRR Qld. Pty. Ltd.*

Description Polyps are elongate, with an axial furrow extending most of the polyp length. Several mouths are arranged along the axial furrow but do not occur outside the furrow. Septal teeth are long and tapered. Tentacles are usually partly extended during the day.

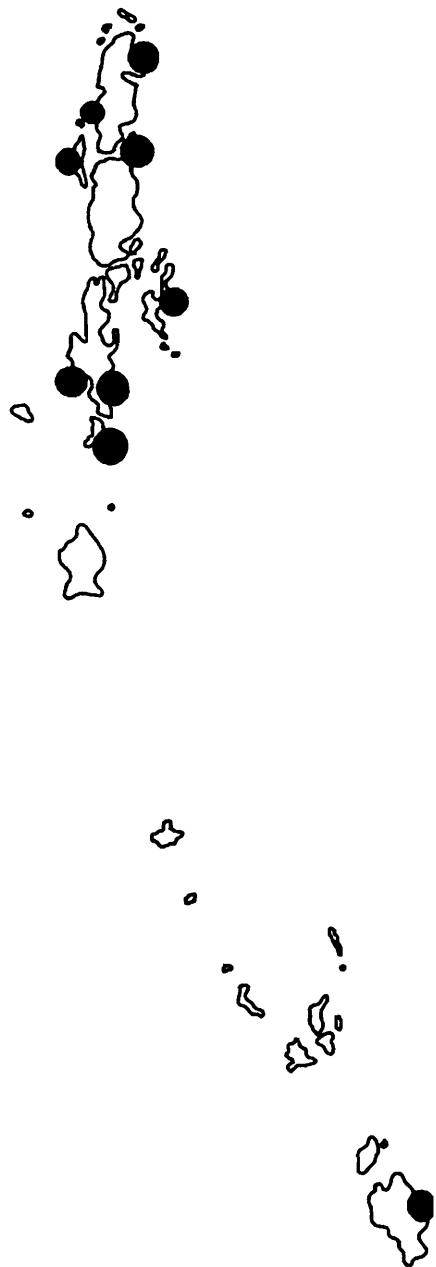




Fig. 32. *Ctenactis albitentaculata* Hoeksema, 1989

Colour : Pale brown with conspicuous white tentacles.

Similar species : *Ctenactis echinata*, which does not have white tentacles and has less tapered septal teeth.

Occurrence : Common.

Material Examined : One material from South Island

Distribution : India : Andaman and Nicobar Islands (South Island) *Elsewhere* : Australia, Fiji, Guam, Indonesia, Japan, Malaysia, Marshall Islands, Palau, Papua New Guinea, Philippines, Singapore, Solomon Islands and Viet Nam.

IUCN Red list Category and Criteria : No entries found.



33. *Ctenactis crassa* (Dana, 1846), Fig. 33

Synonyms

- Fungia simplex* (Gardiner, 1905).
Fungia brachystoma Thiel, 1932.
Fungia crassa Dana, 1846.
Herpetoglossa simplex (Gardiner, 1905).
Herpetoglossa secunda Nemenzo, 1988.
Herpolitha crassa (Dana, 1846).
Herpolitha simplex Gardiner, 1905.

Taxonomic references

- Dana, J.D. 1846. Zoophytes. United States Exploring Expedition during the years 1831-1842 under the command of Charles Wilkes 8 : 1-740. Lea and Blanchard. -Philadelphia.
- Hoekesma, B.W. 1989. Systematics and ecology of mushroom corals (Scleractinia : Fungiidae). *Zool Verhandelingen*, **254** : 1-471.
- Cairns, S.D. 1991. Catalog of the type specimens of stony corals (Milleporidae, Stylasteridae, and Scleractinia) in the National Museum of Natural History, Smithsonian Institution. *Smithsonian Contributions to Zoology* (514) : 1-59.
- Cairns, S.D., Hoeksema, B.W. and van der Land, J. 1999. List of extant stony corals. Appendix (pp. 13-46) in S.D. Cairns, Species richness of Recent Scleractinia. *Atoll Research Bulletin*, **459** : 1-46.

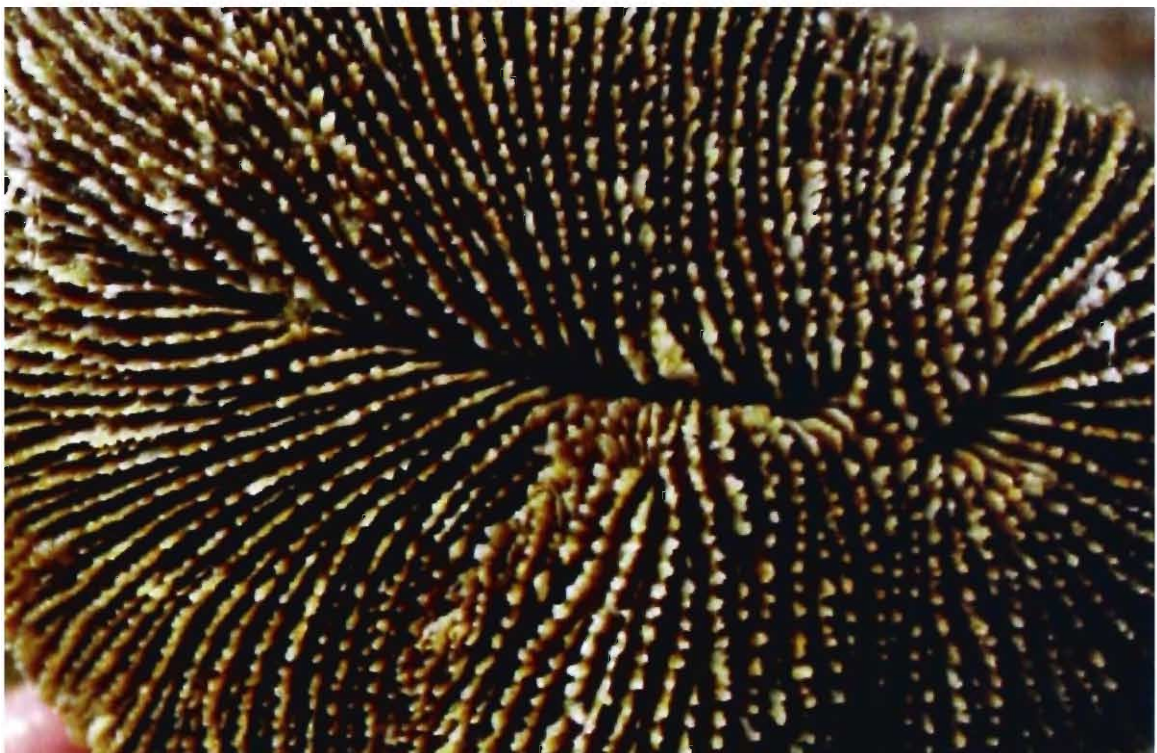


Fig. 33. *Ctenactis crassa* (Dana, 1846)

Veron, J.E.N. 2000. Corals of the world. 3 vols. *Australian Institute of Marine Science and CRR Qld. Pty. Ltd.*

Description : Polyps are elongate, with an axial furrow extending almost to the polyp ends. Several mouths are arranged along the axial furrow but do not occur outside the furrow. Adults are free living. The septa are very densely packed and straight. The septa of lower orders are thick and solid, those of higher orders thin and perforated. Tentacular lobes are absent. The septal margins are coarsely ornamented with irregularly angular dentations. The corallum wall is perforated and covered with granulations. The costae are almost equal in size; they are straight and distinct near the corallum margin, but less distinct near the centre.

Colour : Pale brown.

Similar species : *Ctenactis echinata*, which has a single mouth.

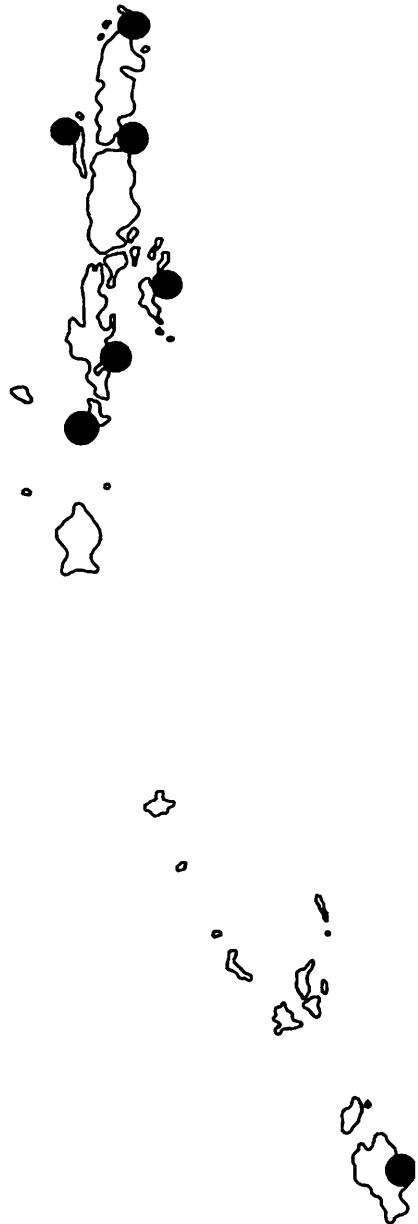
Occurrence : Common.

Material Examined : Twenty specimens of this species were examined. Largest specimen was 32.1 cm in length, 15.5 cm in width whereas in the smallest one the length was 3.8cm, width- 2.4 cm.

Distribution : India Andaman and Nicobar Islands (Avis Island, Sound Island, Rail Island, Smith Island, Ross Island, North Reef Island, Interview Island, Rutland Island, Grub Island, Jolly Bouy Island, Pongibalu, North Bay Island, Great Nicobar Island and Ritchie's Archipelago)

Elsewhere American Samoa, Australia, British Indian Ocean Territory, Cocos (Keeling) Islands, Djibouti, Fiji, French Polynesia, India, Indonesia, Japan, Jordan, Malaysia, Maldives, Marshall Islands, Micronesia (Federated States of), Myanmar, New Caledonia, Palau, Papua New Guinea, Philippines, Saudi Arabia, Singapore, Solomon Islands, Taiwan, Province of China, Thailand, Tuvalu, Vanuatu and Viet Nam.

IUCN Red list Category and Criteria Least Concern.



Genus *Herpolitha* Eschscholtz, 1825

Taxonomic references

- Wells, J.W. 1966. Evolutionary development of the scleractinian family Fungiidae. In : Rees WJ (ed) The Cnidaria and their evolution. *Symp. Zool. Soc. London*, **16** : 223-246.
- Veron, J.E.N. and Pichon, M. 1980. Scleractinia of Eastern Australia. Part 3, Families Agariciidae, Siderasteridae, Fungiidae, Oculinidae, Merulinidae, Mussidae, Pectiniidae, Caryophylliidae, Dendrophylliidae. *Australian Inst. Mar. Sci. Monogr. Ser.*, **IV** : 1-471.
- Hoekesma, B.W. 1989. Systematics and ecology of mushroom corals (Scleractinia : Fungiidae). *Zool Verhandelingen*, **254** : 1-47.
- Veron, J.E.N. 2000. Corals of the world. 3 vols. *Australian Institute of Marine Science and CRR Qld. Pty. Ltd.*

Description : Colonies are elongate with an axial furrow. Mouths occur inside the furrow and may occur over the rest of the upper surface.

Similar Genus : *Ctenactis* are single individuals, sometimes with several mouths, whereas *Herpolitha* are colonial.

34. *Herpolitha weberi* Horst, 1921, Fig. 34

Synonym

Fungia weberi van der Horst, 1921.

Taxonomic references

- Horst, C.J. van der 1921. The Madreporaria of the Siboga Expedition. II. Madreporaria Fungida. *Siboga-Expeditie*, **16b** : 53-98.
- Veron, J.E.N. and Pichon, M. 1980. Scleractinia of Eastern Australia. Part 3, Families Agariciidae, Siderasteridae, Fungiidae, Oculinidae, Merulinidae, Mussidae, Pectiniidae, Caryophylliidae, Dendrophylliidae. *Australian Inst. Mar. Sci. Monogr. Ser.*, **IV** : 1-471.
- Veron, J.E.N. 2000. Corals of the world. 3 vols. *Australian Institute of Marine Science and CRR Qld. Pty. Ltd.*
- DeVantier, L. 2003 Reef-building corals and coral communities of Nui Chua National Park, Ninh Thuan, Vietnam. Rapid Ecological Assessment of biodiversity, April 2003 WWF Indochina Programme.

Description : Colonies are flat, narrow and elongate, usually with pointed ends. Mouths occur only within the axial furrow, which runs to the tips of the colony. Usually all septo-costae extend from the axial furrow to the perimeter. Tentacles may extend day and night.



Fig. 34. *Herpolitha weberi* Horst, 1921

Colour : Polyps are pale brown or mottled.

Similar species : *Herpolitha limax*, which has secondary centres and seldom has axial furrows extending the full length of the colony.

Occurrence : Uncommon.

Material Examined : Ten specimens were examined. The length of the largest specimen is 48.2 cm. and width is 15.1 cm whereas the length of the smallest specimen is 4.7 cm and width is 2.3 cm.

Distribution : India : Andaman and Nicobar Islands (Rutland Island, Smith Island, Ritchie's Archipelago, North Reef Island, Sound Island)

Elsewhere : Fiji, Indonesia, Japan, Madagascar, Malaysia, Mauritius, Micronesia (Federated States of), Papua New Guinea, Philippines, Solomon Islands and Viet Nam.

IUCN Red List Category and Criteria : Least Concern.



35. *Herpolitha limax* (Houttuyn, 1772), Fig. 35

Synonyms

Haliglossa interrupta Ehrenberg, 1834.

Haliglossa foliosa Ehrenberg, 1834.

Haliglossa stellaris Ehrenberg, 1834.

Herpetolitha crassus Dana, 1846.

Herpetolitha stricta Dana, 1846.

Herpetolitha ampla Verrill, 1864.

Herpolitha stricta (Dana, 1846).

Madrepora limax Esper, 1797.

Madrepora trilinguis Boddaert, 1768.

Taxonomic references

Esper, E.J.C. 1797. Die Pflanzenthier in Abbildungen nach der Natur mit Farben erleuchtet nebst Bemerkungen. Abbildungen 1 : Madrepora. Forsetzungen. 230 pp. Raspischen Buchhandlung. –Nürnberg.

Wells, J.W. 1954. Recent corals of the Marshall Islands. *Professional Paper, United States Geological Survey* (2601) : 385-486.

Veron, J.E.N. and Pichon, M. 1980. Scleractinia of Eastern Australia. Part 3, Families Agariciidae, Siderasteridae, Fungiidae, Oculinidae, Merulinidae, Mussidae, Pectiniidae, Caryophylliidae, Dendrophylliidae. *Australian Inst. Mar. Sci. Monogr. Ser.*, IV : 1-471.

Cairns, S.D., Hoeksema, B.W. and van der Land, J. 1999. List of extant stony corals. Appendix (pp. 13-46) in S.D. Cairns, Species richness of Recent Scleractinia. *Atoll Research Bulletin*, 459 : 1-46.



Fig. 35. *Herpolitha limax* (Houttuyn, 1772),

Veron, J.E.N. 2000. Corals of the world. 3 vols. *Australian Institute of Marine Science and CRR Qld. Pty. Ltd.*

DeVantier, L. 2003. Reef-building corals and coral communities of Nui Chua National Park, Ninh Thuan, Vietnam. Rapid Ecological Assessment of biodiversity, April 2003. WWF Indochina Programme.

Description : Colonies are usually elongate and generally have rounded ends. Mouths occur within the axial furrow which runs most of the length of the colony. Secondary mouths outside the furrow are numerous. Few if any primary septo-costae extend from the axial furrow to the perimeter. Some colonies develop forked axial furrows and become Y, T or X shaped. Tentacles are extended only at night.

Colour : Pale or dark brown or greenish brown.

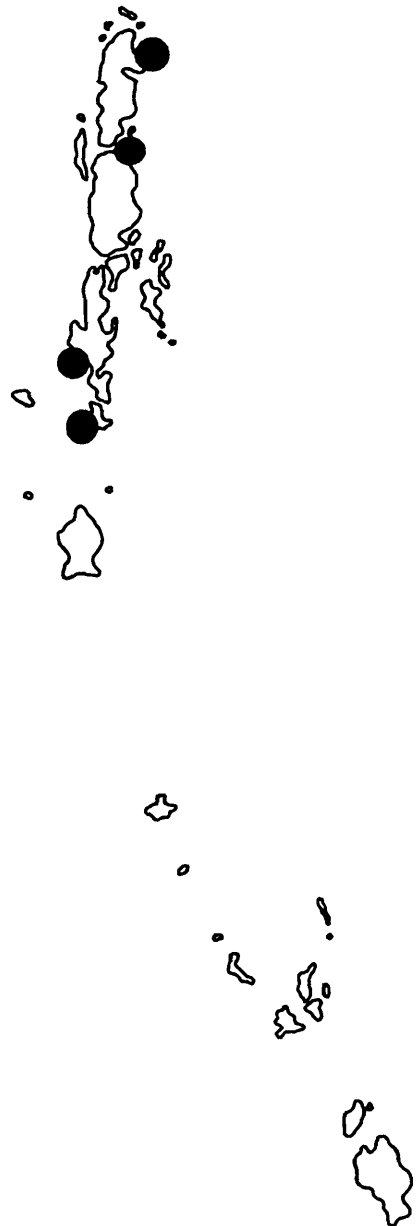
Similar species : *Herpolitha weberi*.

Occurrence : Common.

Material Examined : Thirteen specimens were examined. The length of the largest specimen is 44.5 cm. and width is 22.7 cm whereas the length of the smallest specimen is 23.1 cm and width is 10.5 cm.

Distribution : India : Andaman and Nicobar Islands (Smith Island, Grub Island, Rutland Island, Jolly Bouy Island, Sound Island and Avis Island)

Elsewhere : American Samoa, Australia, British Indian Ocean Territory, China, Cocos (Keeling) Islands, Cook Islands, Djibouti, Egypt, Fiji, French Polynesia, Guam, India, Indonesia, Israel, Japan, Jordan, Kenya, Kiribati, Madagascar, Malaysia, Maldives, Marshall Islands, Mauritius, Micronesia (Federated States of), Mozambique, Myanmar, New Caledonia, Northern Mariana Islands, Palau, Papua New Guinea, Philippines, Réunion, Samoa, Saudi Arabia, Seychelles, Singapore, Solomon Islands, South Africa, Sri Lanka, Sudan, Taiwan, Province of China, Thailand, Tonga, United Republic of Tanzania, United States Minor Outlying Islands, Vanuatu and Viet Nam.



IUCN Red List Category and Criteria : Least Concern.

Genus *Polyphyllia* Quoy and Gaimard, 1833

Taxonomic references

- Wells, J.W. 1966. Evolutionary development of the scleractinian family Fungiidae. In : Rees WJ (ed) The Cnidaria and their evolution. *Symp. Zool. Soc. London*, **16** : 223-246.
- Veron, J.E.N. and Pichon, M. 1980. Scleractinia of Eastern Australia. Part 3, Families Agariciidae, Siderasteridae, Fungiidae, Oculinidae, Merulinidae, Mussidae, Pectiniidae, Caryophylliidae, Dendrophylliidae. *Australian Inst. Mar. Sci. Monogr. Ser. IV* : 1-471.
- Hoekesma, B.W. 1989. Systematics and ecology of mushroom corals (Scleractinia : Fungiidae). *Zool Verhandelingen*, **254** : 1-471.
- Veron, J.E.N. 2000. Corals of the world. 3 vols. *Australian Institute of Marine Science and CRR Qld. Pty. Ltd.*

Description : Colonies are free living with a high arch. Primary septa are short and petaloid in shape. The axial furrow is normally indistinct except in small colonies.

Similar genera *Herpolitha* and *Podabacia*.

36. *Polyphyllia talpina* (Lamarck, 1801), Fig. 36

Synonyms

- Fungia talpina* Lamarck, 1801.
- Polyphyllia producta* Folkeson, 1919.
- Polyphyllia leptophylla* Ehrenberg, 1834.
- Polyphyllia sigmoides* Ehrenberg, 1834.
- Polyphyllia fungia* Dana, 1846.
- Cryptabacia talpina* (Lamarck, 1801).
- Cryptabacia leptophylla* (Ehrenberg, 1834).

Taxonomic references

- Lamarck, J.B.P. A. de Monet de 1801. *Système des animaux sans vertèbres*. Deterville. -Paris.
- Veron, J.E.N. and Pichon, M. 1980. Scleractinia of Eastern Australia. Part 3, Families Agariciidae, Siderasteridae, Fungiidae, Oculinidae, Merulinidae, Mussidae, Pectiniidae, Caryophylliidae, Dendrophylliidae. *Australian Inst. Mar. Sci. Monogr. Ser., IV* : 1-471.
- Hoekesma, B.W. 1989. Systematics and ecology of mushroom corals (Scleractinia : Fungiidae). *Zool. Verhandelingen*, **254** : 1-471.
- Veron, J.E.N. 2000. Corals of the world. 3 vols. *Australian Institute of Marine Science and CRR Qld. Pty. Ltd.*

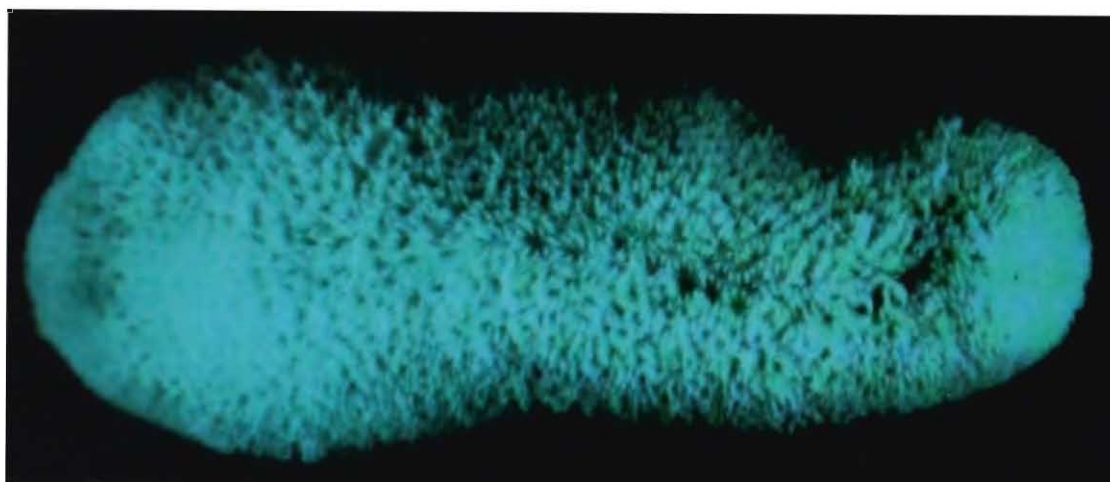


Fig. 36. *Polyphyllia talpina* (Lamarck, 1801)

Description : Colonies are free living and elongate, with an axial furrow that may become indistinct. Colonies are occasionally Y, T or X shaped. Centres are evenly distributed over the upper surface. Primary septa are short and elliptical or petaloid. Secondary septa usually fuse around the primaries to form a background matrix. Tentacles are usually extended during the day; they are long and numerous.

Colour : Grey, greenish or cream, with white tentacle tips.

Similar species : *Polyphyllia novaehiberniae*.

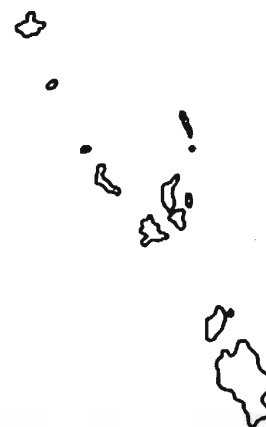
Occurrence : Common.

Material Examined : One specimen was examined. The length of the specimen was 11 cm. and width was 4 cm.

Distribution : India : Andaman and Nicobar Islands (Rutland Island)

Elsewhere : American Samoa, Australia, British Indian Ocean Territory, Fiji, Indonesia, Japan, Madagascar, Malaysia, Maldives, Marshall Islands, Micronesia (Federated States of), Mozambique, Myanmar, New Caledonia, Palau, Papua New Guinea, Philippines, Seychelles, Singapore, Solomon Islands, Taiwan, Province of China, Thailand, Tonga and Viet Nam.

IUCN Red List Category and Criteria : Least Concern.



Genus *Sandalolitha* Quelch, 1884

Taxonomic references

- Veron, J.E.N. and Pichon, M. 1980. Scleractinia of Eastern Australia. Part 3, Families Agariciidae, Siderasteridae, Fungiidae, Oculinidae, Merulinidae, Mussidae, Pectiniidae, Caryophylliidae, Dendrophylliidae. *Australian Inst. Mar. Sci. Monogr. Ser.*, IV : 1-471.
- Hoekesma, B.W. 1989. Systematics and ecology of mushroom corals (Scleractinia : Fungiidae). *Zool Verhandelingen*, 254 : 1-471.
- Veron, J.E.N. 2000. Corals of the World. 3 vols. *Australian Institute of Marine Science and CRR Qld. Pty. Ltd.*

Description Colonies are heavily constructed without an axial furrow. Corallites are numerous, exsert and outward facing.

Similar genus : *Halomitra*, which is of lighter construction with corallites further apart.

37. *Sandalolitha robusta* Quelch, 1886, Fig. 37

Synonyms

- Halomitra irregularis* Gardiner, 1898.
- Halomitra robusta* (Quelch, 1886).
- Podabacia robusta* Quelch, 1886.
- Doederleinia irregularis* Gardiner, 1909.
- Parahalomitra irregularis* (Gardiner, 1898).
- Parahalomitra robusta* (Quelch, 1886).

Taxonomic references

- Quelch, J.J. 1886. Report on the reef corals collected by H.M.S. Challenger during the years 1873-76. *Scientific Reports Res. Voyage H.M.S. Challenger, Zoology*, 16(46) : 203 pp.
- Wells, J.W. 1954. Recent corals of the Marshall Islands. *Professional Paper, United States Geological Survey*, (2601) : 385-486.
- Veron, J.E.N. and Pichon, M. 1980. Scleractinia of Eastern Australia. Part 3, Families Agariciidae, Siderasteridae, Fungiidae, Oculinidae, Merulinidae, Mussidae, Pectiniidae, Caryophylliidae, Dendrophylliidae. *Australian Inst. Mar. Sci. Monogr. Ser.* IV : 1-471.
- Hoekesma, B.W. 1989. Systematics and ecology of mushroom corals (Scleractinia : Fungiidae). *Zool. Verhandelingen*, 254 : 1-471.
- Cairns, S.D., Hoekesma, B.W. and van der Land, J. 1999. List of extant stony corals. Appendix (pp. 13-46) in S.D. Cairns, Species richness of Recent Scleractinia. *Atoll Research Bulletin*, 459 : 1- 46.



Fig. 37. *Sandalolitha robusta* Quelch, 1886

Veron, J.E.N. 2000. Corals of the World. 3 vols.
*Australian Institute of Marine Science and CRR
 Qld. Pty. Ltd.*

Description : Colonies are large, free-living, circular to oval, dome-shaped and heavily constructed, without an axial furrow. Corallites are compact. Septa vary little in height. Tentacles are extending only at night.

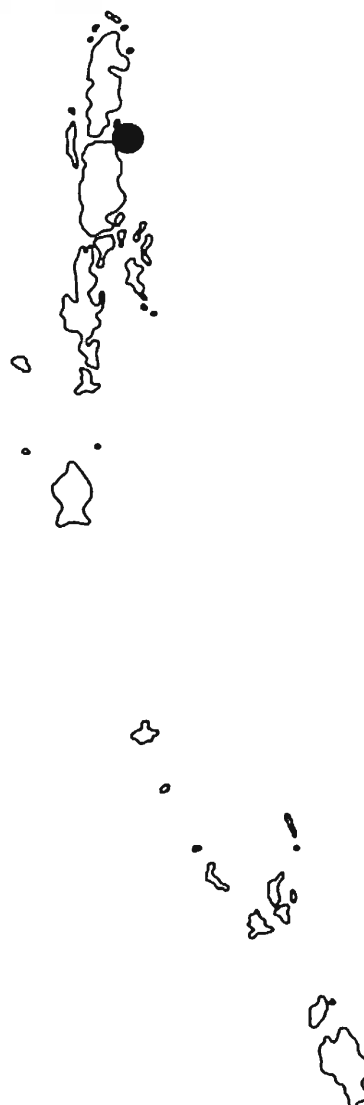
Colour : Usually pale or dark brown or green, sometimes mottled and sometimes with purple margins and white corallite centres.

Similar species : *Sandalolitha dentate*, which is irregular in shape and less, domed, with widely spaced corallites.

Occurrence : Common.

Material Examined : Seven specimens were examined. The diameter of the largest specimen was 13.2 cm. and smallest one was 5.3 cm.

Distribution : India : Andaman and Nicobar Islands (Avis Island and Rail Island).



Elsewhere : American Samoa, Australia, China, Cocos (Keeling) Islands, Cook Islands, Djibouti, Fiji, French Polynesia, Indonesia, Japan, Kiribati, Malaysia, Maldives, Marshall Islands, New Caledonia, Palau, Papua New Guinea, Philippines, Seychelles, Singapore, Solomon Islands, Taiwan, Province of China, Thailand, Tonga, Tuvalu, United States Minor Outlying Islands, Vanuatu and Viet Nam.

IUCN Red List Category and Criteria : Least Concern.

38. *Sandalolitha dentata* Quelch, 1884, Fig. 38

Synonyms

Doederleinia sluiteri van der Horst, 1921.

Parahalomitra dentata (Quelch, 1884).

Taxonomic references

Quelch, J.J. 1884. Preliminary notice of some new genera and species of Challenger reef-corals. *Annals and Magazine of Natural History* (5)13 : 292-297.

Hoekesma, B.W. 1989. Systematics and ecology of mushroom corals (Scleractinia : Fungiidae). *Zool. Verhandelingen*, 254 : 1-471

Cairns, S.D., Hoekesma, B.W. and van der Land, J. 1999. List of extant stony corals. Appendix (pp. 13-46) in S.D. Cairns, Species richness of Recent Scleractinia. *Atoll Research Bulletin* , 459 : 1-46 pp.

Veron, J.E.N. 2000. Corals of the world. 3 vols. *Australian Institute of Marine Science and CRR Qld. Pty. Ltd.*



Fig. 38. *Sandalolitha dentata* Quelch, 1884

Description : Colonies are flat and irregular in shape, with corallites mostly in the central area. An axial furrow can be seen in small specimens. Septa vary gently in height.

Colour : Brown or mottles, usually with white corallite centres.

Similar species : *Sandalolitha robusta*

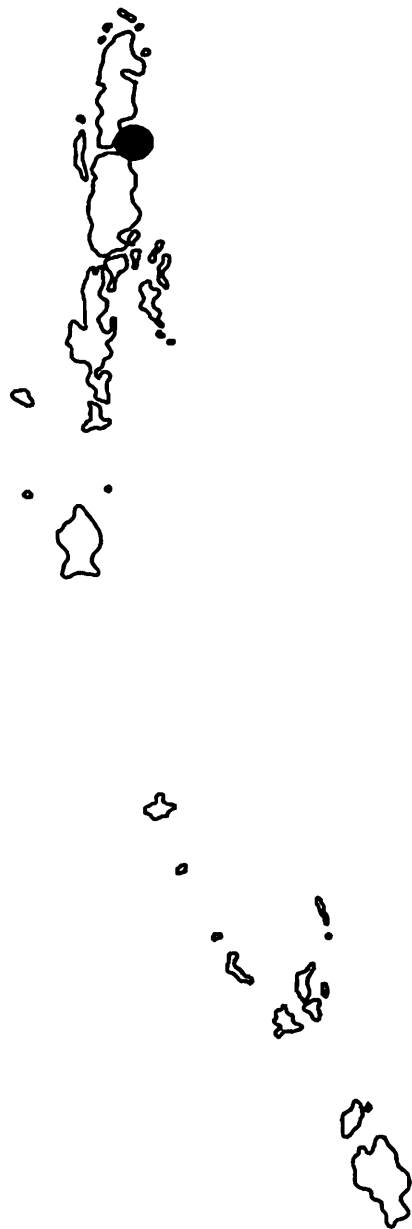
Occurrence : Usually uncommon

Material Examined : One specimen was examined. The length of the specimen was 14.1 cm and width was 6.2 cm.

Distribution : India : Andaman and Nicobar Island (Avis Island).

Elsewhere : Australia, Christmas Island, Cook Islands, Fiji, French Polynesia, Guam, Indonesia, Japan, Kiribati, Malaysia, Maldives, Marshall Islands, Micronesia (Federated States of), Palau, Papua New Guinea, Philippines, Samoa, Seychelles, Solomon Islands, Taiwan, Province of China and Viet Nam.

IUCN Red List Category and Criteria : Least Concern.



Genus *Halomitra* Dana, 1846

Taxonomic references

- Wells, J.W. 1966. Evolutionary development of the scleractinian family Fungiidae. In : Rees, W.J. (ed.) The Cnidaria and their evolution. *Symp. Zool. Soc. London*, **16** : 223-246.
- Veron, J.E.N. and Pichon, M. 1980. Scleractinia of Eastern Australia. Part 3, Families Agariciidae, Siderasteridae, Fungiidae, Oculinidae, Merulinidae, Mussidae, Pectiniidae, Caryophylliidae, Dendrophylliidae. *Australian Inst. Mar. Sci. Monogr. Ser.*, **IV** : 1-471.
- Hoekesma, B.W. 1989. Systematics and ecology of mushroom corals (Scleractinia : Fungiidae). *Zool. Verhandelingen*, **254** : 1- 471.
- Veron, J.E.N. 2000. Corals of the world. 3 vols. *Australian Institute of Marine Science and CRR Qld. Pty. Ltd.*

Description : Colonies are thin walled and delicate, with outward facing corallites. Adults are free living. Corolla is polycentric, free, subcircular, and gently convex or strongly arched (bell-shaped), without, an axial furrow. The corallum wall is perforated and its lower surface is granulated. The septal and costal ornamentations are coarse. The granulations on the septal sides are either arranged in rows or in ridges perpendicular to the septal margin. Colony formation is by circumoral, polycyclic polystomodeal budding. Septo-costal characters are those of *Fungia fungities*. Polyps are extended only at night. Tentacles are small and widely spaced.

Similar genus : *Sandalolitha*, which has a heavier construction, with corallites closer together and septo-costae more exsert, and *Podabacia*.

39. *Halomitra pileus* (Linnaeus, 1758), Fig. 39

Synonyms

- Fungia limacina* Lamarck, 1801
Halomitra philippinensis (Studer, 1901)
Halomitra clypeus Verrill, 1864
Halomitra tiara Verrill, 1864
Halomitra concentrica Studer, 1901
Halomitra louwinae van der Horst, 1921
Podabacia philippinensis Studer, 1901
Haliglossa limacina (Lamarck, 1801)
Madrepora pileus Linnaeus, 1758

Taxonomic references

- Linnaeus, C. 1758. Systema naturae. Edition 10. *Laurentii Salvii*. –Holmiae.
- Veron, J.E.N. and Pichon, M. 1980. Scleractinia of Eastern Australia. Part 3, Families Agariciidae, Siderasteridae, Fungiidae, Oculinidae, Merulinidae, Mussidae, Pectiniidae, Caryophylliidae, Dendrophylliidae. *Australian Inst. Mar. Sci. Monogr. Ser.*, IV : 1-471.
- Hoekesma, B.W. 1989. Systematics and ecology of mushroom corals (Scleractinia : Fungiidae). *Zool Verhandelingen*, 254 : 1-471
- Cairns, S.D., Hoekesma, B.W. and van der Land, J. 1999. List of extant stony corals. Appendix (pp. 13-46) in S.D. Cairns, Species richness of Recent Scleractinia. *Atoll Research Bulletin* , 459 : 1-46.
- Veron, J.E.N. 2000. Corals of the world. 3 vols. *Australian Institute of Marine Science and CRR Qld. Pty. Ltd.*



Fig. 39. *Halomitra pileus* (Linnaeus, 1758)

Description : Colonies are large, free living, thin and delicate and circular, dome or bell shaped. They have no axial furrow. Corallites are widely spaced and increase in size as the colony grows. In small colonies, septo-costae radiate in a fan from the initial point of growth or/ are perpendicular to the colony margin, in which case they form distinct lines of demarcation. Septa have teeth similar to those of *Fungia fungites*. Tentacles of mature colonies are extended only at night; those juvenile colonies are commonly extended during the day.

Colour : Pale brown, frequently with bright pink or purple margins. Corallites centres are commonly white.

Similar species : *Halomitra clavator*. Juvenile colonies may resemble *Zoopilus echinatus* if septo-costae form the pattern.

Occurrence : Uncommon.

Material Examined : Three specimens were examined. The larger one is 16.3 cm in diameter and the smaller one is 7.1 cm.

Distribution : India : Andaman and Nicobar Islands (Sound Island and North Reef Island)

Elsewhere American Samoa, Australia, British Indian Ocean Territory, Djibouti, Fiji, Indonesia, Japan, Kiribati, Madagascar, Malaysia, Maldives, Marshall Islands, Micronesia (Federated States of), Palau, Papua New Guinea, Philippines, Samoa, Seychelles, Singapore, Solomon Islands, Taiwan, Province of China, Thailand, Tonga, United Republic of Tanzania, United States Minor Outlying Islands, Vanuatu and Viet Nam.

IUCN Red List Category and Criteria : Least Concern.

Genus *Lithophyllon* Rehberg, 1892

Taxonomic references

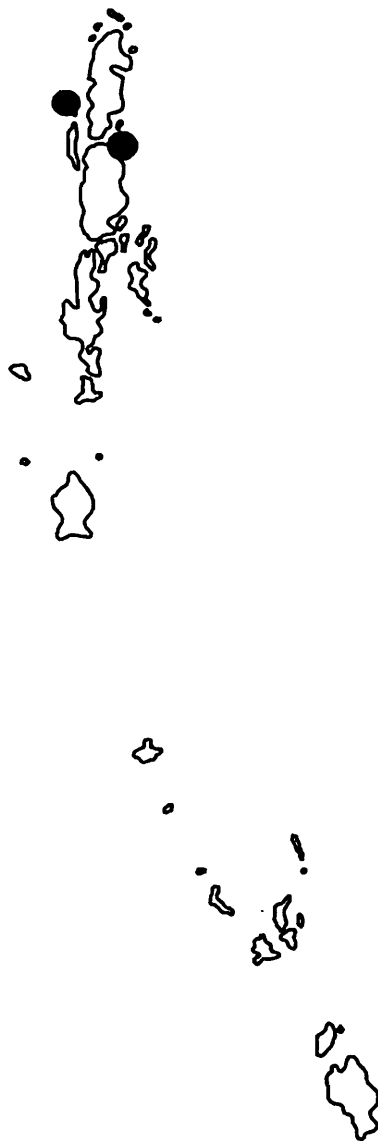
Yabe H, Sugiyama, T. and Eguchi, M. 1936. Recent reef building corals from Japan and the South Sea Islands under the Japanese mandate. *Sci. Rept. Tohoku Univ. Second Ser. (Geology)*, 1 : 1-166.

Veron, J.E.N. 1992. Hermatypic corals of Japan. *Australian Inst. Mar. Sci monogr. Ser.*, IX : 1-86

Veron, J.E.N. 2000. Corals of the world. 3 vols. *Australian Institute of Marine Science and CRR Qld. Pty. Ltd.*

Description : Colonies are flat, attached, and encrusting or explanate, with one or many centres. Colony walls are solid; septo-costae are *Cycloseris* - like. The animals remain in anthocaulus stage. The polyps are polystomous by circumstomadeal budding. The corallium wall is solid and does not form fragmentation clefts. The septal dentations are ravel-shapes. The costae are simply granular, cylindrical-conical and granulated or arborescent. Corollam are polycentric, explanate, foliaceous, unifacial and attached to the substratum in the adult stage. Colony formation is by marginal budding.

Similar genus *Podabacia*.



40. *Lithophyllon lobata* (Horst, 1921), Fig. 40**Taxonomic references**

Horst, C.J. van der 1921. The Madreporaria of the Siboga Expedition. II. Madreporaria Fungida. *Siboga-Expeditie*, **16b** : 53-98.

Veron, J.E.N. and Hodgson, G. 1989. Annotated checklist of the hermatypic corals of the Philippines. *Pacific Sci.*, **43** : 234-287.

Veron, J.E.N. 1992. Hermatypic corals of Japan. *Australian Inst. Mar. Sci monogr. Ser.*, **IX** : 1-86

Veron, J.E.N. 2000. Corals of the world. 3 vols. *Australian Institute of Marine Science and CRR Qld. Pty. Ltd.*

Description : Colonies are encrusting, has one large central corallite is formed and this is distinctive. Peripheral corallites are usually much smaller. Sometimes there is a small cluster of central corallites. Septocostae radiate from the central corallite, are thin, wavy and exsert and may have tentacular lobes.

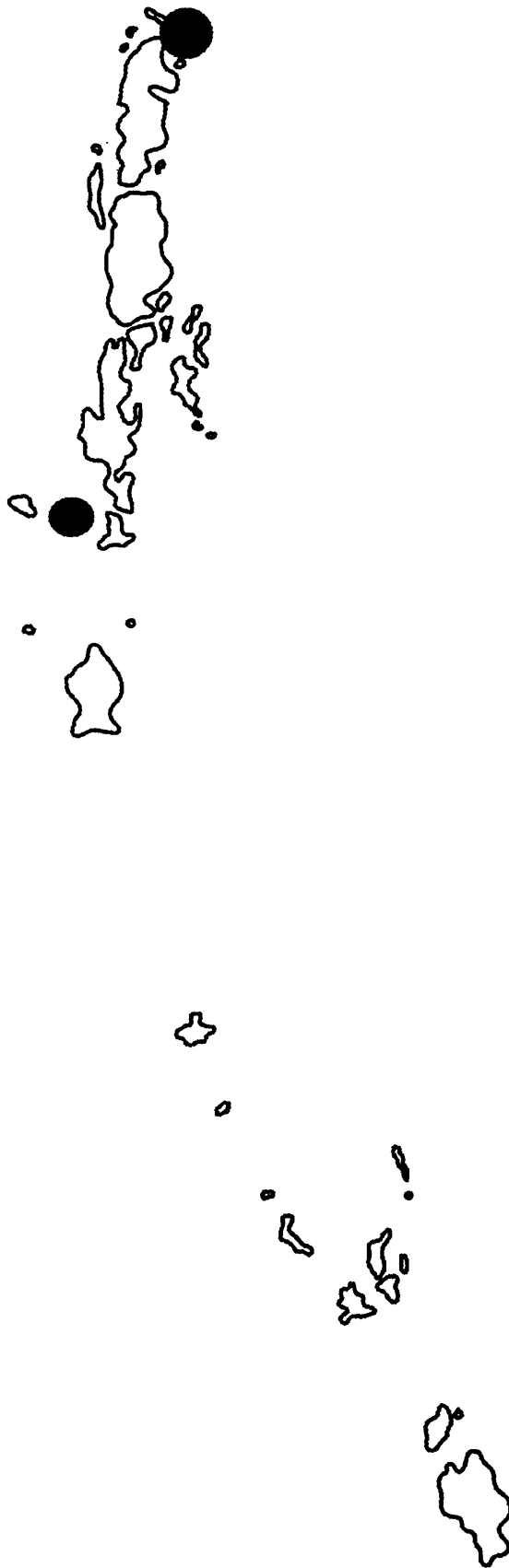
Colour : Brown, may be mottled.

Similar species : Distinguished from *Lithophyllon undulatum* by having a prominent central corallite.

Occurrence : Usually uncommon.



Fig. 40. *Lithophyllon lobata* (Horst, 1921)



Distribution : India : Andaman and Nicobar Islands (Smith Island and Rutland Island)

Elsewhere Japan, Philippines and Solomon Islands.

IUCN Red List Category and Criteria : Near Threatened.

41. *Lithophyllon undulatum* Rehberg, 1892, Fig. 41**Synonyms**

Lithophyllon levistei Nemenzo, 1971

Podabacia lobata van der Horst, 1921

Podabacia formosa Yabe and Sugiyama, 1932

Podabacia dispar Verrill, 1901

Taxonomic references

Rehberg, H. 1892. Neue und wenig bekannte Korallen. *Abhandlungen aus dem Gebiete der Naturwissenschaften Verein. Hamburg*, **12** : 1-50.

Hoekesma, B.W. 1989. Systematics and ecology of mushroom corals (Scleractinia : Fungiidae). *Zool Verhandelingen*, **254** : 1-471

Veron, J.E.N. 1992. Hermatypic corals of Japan. *Australian Inst. Mar. Sci monogr. Ser.*, **IX** : 1-86.

Cairns, S.D., Hoekesma, B.W. and van der Land, J. 1999. List of extant stony corals. Appendix (pp. 13-46) in S.D. Cairns, Species richness of Recent Scleractinia. *Atoll Research Bulletin*, **459** : 1-46.

Veron, J.E.N. 2000. Corals of the world. 3 vols. *Australian Institute of Marine Science and CRR Qld. Pty. Ltd.*



Fig. 41. *Lithophyllon undulatum* Rehberg, 1892

Description Colonies are encrusting or form flat laminae with lobed margins. There is usually no central corallite. Septo-costae are thin and exsert.

Colour : Deep green or brown in the northern part of the range, dark blue with white corallite centres in the southern part.

Similar species *Lithophyllon lobata*.

Occurrence : Usually uncommon.

Material Examined Twenty one specimens were examined. The length of the largest specimen was 23.7 cm and the smallest one was 5.2 cm.

Distribution : India : Andaman and Nicobar Islands (Smith Island, Ross Island, Arial Bay, Rutland Island, Jolly Bouy Island, Tarmugli Island, Sound Island, Avis Island, Rail Island, Little Andaman, Car Nicobar)

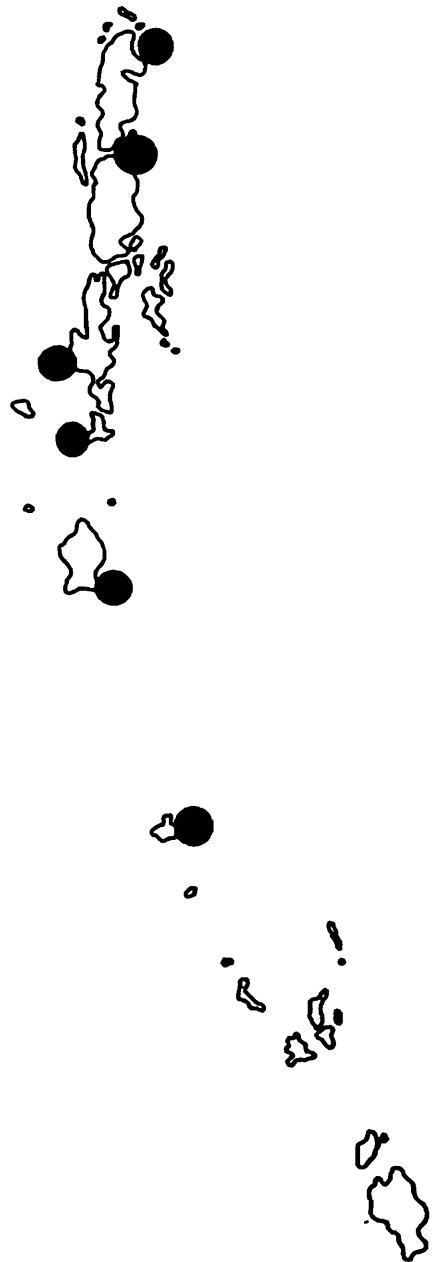
Elsewhere : Australia, China, Fiji, Hong Kong, Indonesia, Japan, Malaysia, Papua New Guinea, Philippines, Samoa, Taiwan, Province of China, Thailand, Vanuatu and Viet Nam.

IUCN Red List Category and Criteria : Near Threatened.

Genus *Podabcia* Milne Edwards and Haime, 1849

Taxonomic references

- Wells, J.W. 1966. Evolutionary development of the scleractinian family Fungiidae. In : Rees, W.J. (ed) The Cnidaria and their evolution. *Symp. Zool. Soc. London*, 16 : 223-246.
- Veron, J.E.N. and Pichon, M. 1980. Scleractinia of Eastern Australia. Part 3, Families Agariciidae, Siderasteridae, Fungiidae, Oculinidae, Merulinidae, Mussidae, Pectiniidae, Caryophylliidae, Dendrophylliidae. *Australian Inst. Mar. Sci. Monogr. Ser. IV* : 1-471.
- Hoekesma, B.W. 1989. Systematics and ecology of mushroom corals (Scleractinia : Fungiidae). *Zool. Verhandelingen*, 254 : 1- 471



Veron, J.E.N. 2000. *Corals of the world*. 3 vols. Australian Institute of Marine Science and CRR Qld Pty Ltd.

Description : Colonies form explanate plates and are generally attached. Corallites are well defined, usually inclined towards the plate margins. Septo-costae are similar to those of *Sandalolitha*. Tentacles are usually extended only at night. The undersurface of the plates are pitted.

Similar genus : *Lithophyllon*.

42. *Podabacia crustacea* (Pallas, 1766), Fig. 42

Synonym

Podabacia involuta van der Horst, 1921

Taxonomic references

Pallas, P.S. 1766 Elenchus Zoophytorum. –La Hague.

Veron, J.E.N. and Pichon, M. 1980. Scleractinia of Eastern Australia. Part 3, Families Agariciidae, Siderasteridae, Fungiidae, Oculinidae, Merulinidae, Mussidae, Pectiniidae, Caryophylliidae, Dendrophylliidae. *Australian Inst. Mar. Sci. Monogr. Ser.*, IV : 1-471.

Hoekesma, B.W. 1989. Systematics and ecology of mushroom corals (Scleractinia : Fungiidae). *Zool Verhandelingen*, 254 : 1-471.



Fig. 42. *Podabacia crustacea* (Pallas, 1766)

Cairns, S.D., Hoeksema, B.W. and van der Land, J. 1999. List of extant stony corals. Appendix (pp. 13-46) in S.D. Cairns, Species richness of Recent Scleractinia. *Atoll Research Bulletin*, 459 : 1- 46.

Veron, J.E.N. 2000. Corals of the World. 3 vols. *Australian Institute of Marine Science and CRR Qld. Pty. Ltd.*

Description : Colonies are attached, encrusting or laminar, unifacial, and may form tiers. A central corallites is sometimes distinguishable; peripheral corallites are exsert and inclined towards the plate margins.

Colour : Tan or dark brown. Septo-costae are cream, often with pale margins.

Similar species Lightly calcified *Sandalolitha robusta* is structurally similar, but is not attached to the substrate.

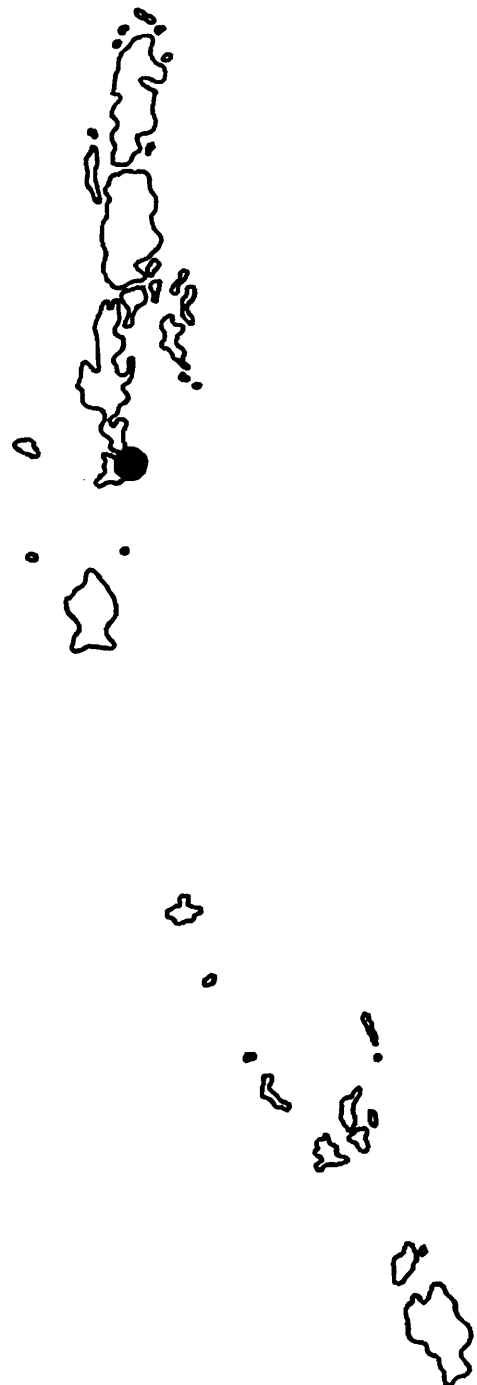
Occurrence Uncommon.

Material Examined . One material was examined. The length of the polyp is 5.8 cm. and width is 4.3 cm.

Distribution : India Andaman and Nicobar Islands (Rutland Island), Lakshadweep Islands and Gulf of Mannar

Elsewhere : Australia, British Indian Ocean Territory, Djibouti, Egypt, Fiji, French Polynesia, Indonesia, Irian, Jaya, Jawa, Lesser Sunda Island, Moluccas, Sulawesi, Sumatera; Israel, Japan, Kenya, Kiribati, Phoenix Island, Madagascar, Malaysia, Peninsular Malaysia, Sabah, Maldives, Mauritius, Mozambique, Myanmar, Papua New Guinea, Philippines, Réunion, Saudi Arabia, Seychelles, Singapore, South Africa, Sri Lanka, Sudan, Taiwan, Province of China, Thailand, Vanuatu and Viet Nam.

IUCN Red List Category and Criteria : No entries found.



43. *Podabcia lankaensis* Veron, 2000, Fig. 43**Taxonomic reference**

Veron, J.E.N. 2000. *Corals of the world*. 3 vols. Australian Institute of Marine Science and CRR Qld. Pty. Ltd

Description : Colonies are loosely attached or free-living, encrusting, or laminar, and unifacial, with irregularly lobed margins and an irregularly contorted surface. There is no central corallite. Peripheral corallites are inclined towards the plate margins. Septo-costae are similar to those of *Halomitra*.

Colour : Grey-brown white margins.

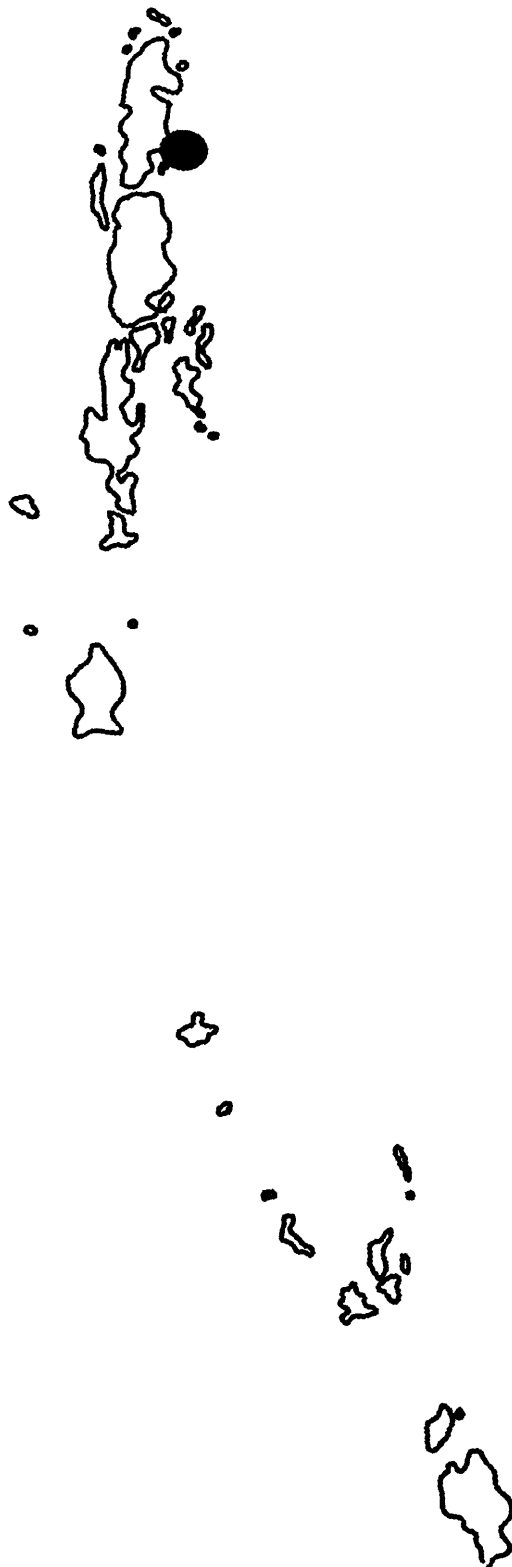
Similar species : This species combines various characters of *Lithophyllon*, *Podabcia* and *Halonitra*. Corallites are smaller, less regular and more inclined on the colony surface than are those of *Podabcia motuporensis*.

Occurrence : Rare.

Material Examined : One material was examined. It is slightly oval in structure. Radius of the polyp is 7.9 cm in longest side and 7.7 cm in shortest side.



Fig. 43. *Podabcia lankaensis* Veron, 2000



Distribution : India : Andaman and Nicobar Islands (Rail Island).

Elsewhere : Sri Lanka.

IUCN Red List Category and Criteria : No entries found.

44. *Podabacia sinai* Veron, 2000, Fig. 44**Taxonomic reference**

Veron, J.E.N. 2000. Corals of the world. 3 vols. *Australian Institute of Marine Science and CRR Qld. Pty. Ltd.*

Description : Colonies are attached, laminar, unifacial and may form tiers. Plates have usually lobed margins and commonly have radiating costal ridges. Corallites are small and not inclined towards the plate margins. Septo-costae are similar to those of *Halomitra*.

Colour : Pale brown with white margins.

Similar species : *Podabacia motuporensis* is very similar, but has smaller corallites and finer costae. *Podabacia crustacean* forms larger colonies and has larger corallites.

Occurrence : Uncommon

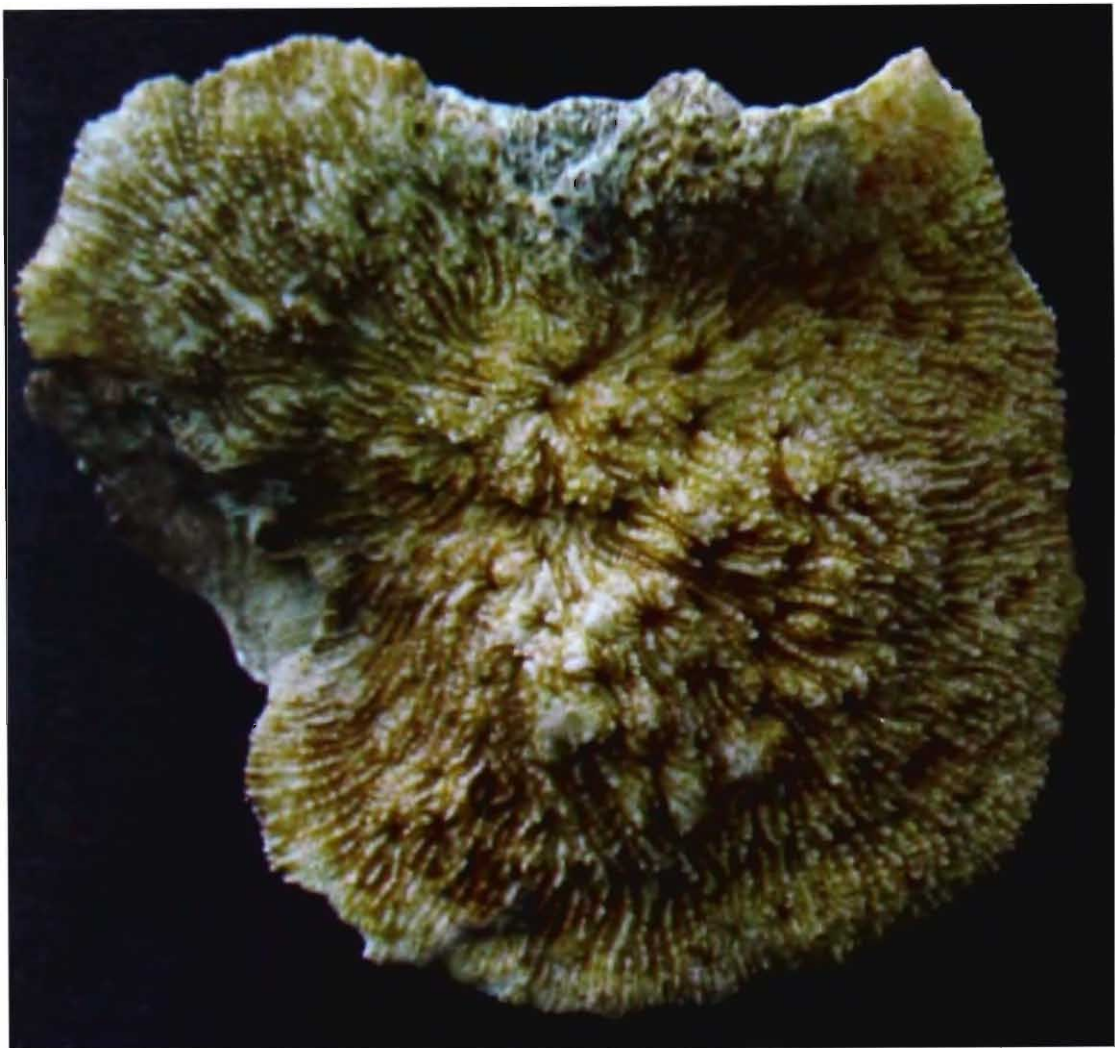
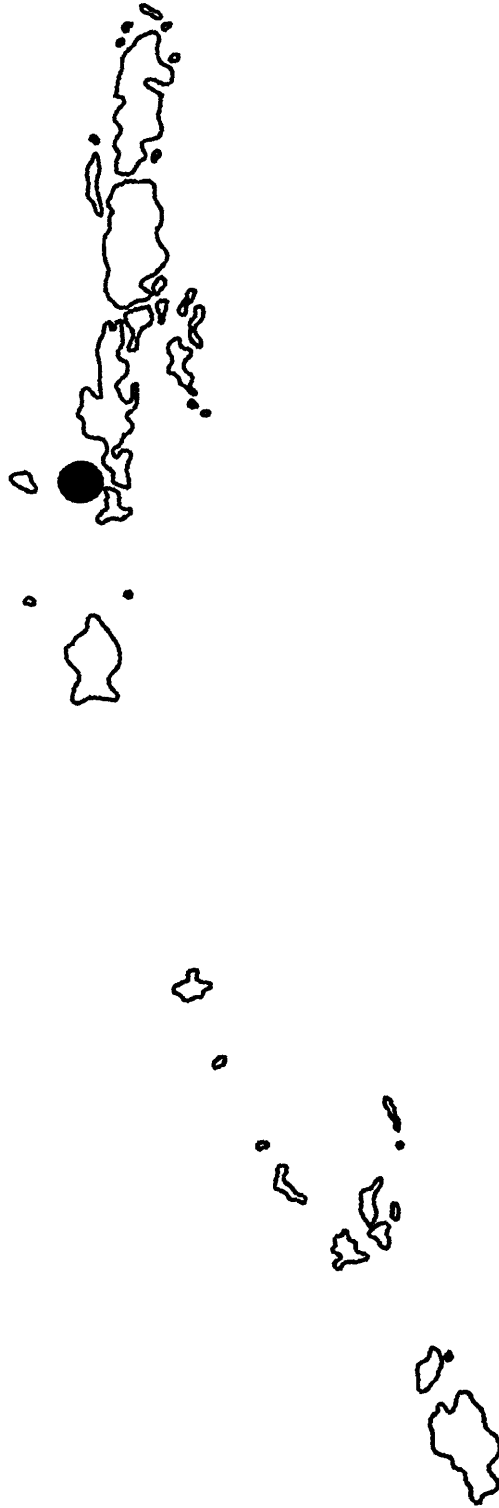


Fig. 44. *Podabacia sinai* Veron, 2000



Material Examined : One material was examined. It is slightly oval in one side and other side is irregular in shape. Radius of the longest side is 8.5 cm. and shortest side is 7.3 cm.

Distribution : India : Andaman and Nicobar Islands (Rutland Island)

Elsewhere : Egypt.

IUCN Red List Category and Criteria : Data deficient.

VALUES OF CORAL REEF

Coral reefs are critical components of the marine environment. These biologically rich habitats provide important ecosystem services to local and regional economies, including tourism, shoreline protection, and fisheries. Coral reefs supply much of the sand for the region's beautiful beaches, and draw divers and snorkelers to explore the diversity of marine life that they support. Coral reefs occupy less than one percent of the Earth's marine environment, but are home to more than a quarter of all known marine fish species and tens of thousands of other species found nowhere else on earth. Reefs also serve as a buffer against incoming storm surges, protecting local populations. Unfortunately, many coastal ecosystems are threatened by human activities including overfishing, agriculture, and urban development. The degradation of coastal ecosystems not only results in a loss of biodiversity but also a loss of revenue, depleted fish stocks and increased exposure of communities to storms. Coral reefs are one of the most biologically diverse ecosystems in the world – they occupy less than 1% of the ocean floor, but are inhabited by at least 25% of all marine species. Thirty-two of the 33 animal phyla are found on coral reefs, compared with nine in tropical rain forests. Due to their unique complexity and diversity, coral reefs can provide food and livelihood opportunities to millions of people. They are vital for small-scale and fisheries, producing 10 percent of the world's fishing harvest. Further, they are hosts to a wide range of organisms that may hold the key to future medical advances. They also provide services such as shoreline protection and recreational opportunities, making their importance for the economies of coastal communities and entire nations immeasurable. However, coral reefs have come under increasing threat around the world, particularly during the last decades, and mostly due to anthropogenic impacts. Roughly one third of the world's coral reefs have been destroyed or highly degraded. The present rate of extinction on coral reefs is estimated to be 1,000 to 10,000 times the background rate without human interference. Coral reefs are threatened by increased sedimentation, eutrophication, over harvesting of fish and other reef based resources, and pollution. In addition, bleaching and mass mortality events caused by climate change appear to have become more frequent as well as more severe, posing a major threat to coral reefs worldwide. More than half of the world's population lives within 200 km from the sea. Land-based activities affect the quality of water flowing into rivers, streams and eventually to the coastal and marine environment. Healthy coastal environments are essential to human health and to support human activities and resource utilization.

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