

SCLERACTINIAN CORALS FROM THE GULF OF KUTCH

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ABSTRACT

The Scleractinian corals of the Gulf of Kutch from the north-west coast of India is taxonomically analysed. The coral fauna include 37 species among 24 genera. Out of these, 20 genera with 33 species are hermatypes and the rest 4 genera and 4 species is ahermatypes. Early mention in literature on the occurrence of genera such as *Pavona*, *Podabacta*, *Leptoria* and *Lobophyllia* from the Gulf of Kutch is not taken into account, since these records are based on unconfirmed determinations. All genera and species considered are widespread in the Indo-Pacific coral provinces and no new species is described herein.

INTRODUCTION

THE RECENT stony corals of the Gulf of Kutch from the north-west coast of India have been very little studied in the past. The first mention of corals from this area is that of Gideon *et al.* (1957) wherein *Astrea*, *Sidastrea* (= *Siderastrea*), *Meandrina* and *Porites* were reported. As already pointed out by Pillai (1987) the exact status of *Astrea* and *Meandrina* as mentioned by Gideon *et al.* (1957) is not clear. During seventies, Patel (1976, 1978) collected corals from many localities in the Gulf of Kutch along the coast of Jamnagar District. Subsequently one of us (Pillai) made a survey of the coral formations of Kutch and collected corals (Pillai *et al.*, 1979) Scheer (1985) and Wafer (1986) listed corals from the Gulf of Kutch based on available information from existing literature until then. A consolidated check-list of coral fauna of the Gulf of Kutch was pre-

sented by Pillai (1987), which is considered herein for a detailed taxonomic analysis.

The area is declared as India's first National Marine Park and it is felt desirable to have a field guide to these most dominant marine benthic organisms. Only material described are listed under the subtitle *localities* under each species, wider distribution of various species gathered by Patel during a prolonged field studies are indicated in Table 1. Synonyms are restricted to save space. The work cited first under each species, with the word synonymy in bracket, may be referred for detailed synonyms. A synopsis of the species described herein under each genus is given to aid identification and descriptions of the present material is minimised. Reference may be made for detailed description of the species from the Indian areas to the works cited under each species. However, brief descriptions and additional synonyms are also provided wherever good descriptions are not readily available. The classification of scleractinia adopted is that of Wells (1956).

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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
<i>Favites complanata</i> (Ehrenberg)	..	X	X	X	X	X	X	X	--	--	X	--	--	--	X	X
<i>F. melicerum</i> (Ehrenberg)	..	X	--	X	--	--	--	--	X	--	--	--	--	--	X	X
<i>Goniastrea pectinata</i> (Ehrenberg)	..	X	X	X	X	X	X	X	--	X	X	X	--	X	X	X
<i>Platygyra sinensis</i> (MED-H)	..	X	X	X	X	--	--	--	--	X	--	--	--	--	X	X
<i>Hydnophora exesa</i> (Pallas)	..	X	X	X	X	--	--	--	--	X	--	--	--	--	--	X
<i>Plesiastrea versipora</i> (Lamarck)	..	--	X	--	--	--	X	--	--	--	--	--	--	--	--	--
<i>Leptastrea purpurea</i> (Dana)	..	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Sikka Point
<i>Cyphastrea serailia</i> (Forsk.)	..	X	X	X	X	X	X	X	X	X	X	--	--	X	X	X
<i>Symphyllia radians</i> (MED-H)	..	--	X	--	X	--	X	--	--	X	--	--	--	--	--	--
<i>Acanthastrea simplex</i> Crossland	..	X	X	X	X	--	--	--	--	X	X	--	--	--	--	X
<i>Mycodium elephantotus</i> (Pallas)	..	--	--	--	X	--	--	--	--	--	--	--	--	--	--	--
<i>Paracyathus stokesi</i> (MED-H)	..	X	--	--	--	--	--	--	--	--	--	--	--	--	--	10 mts.
<i>Polycyathus verrilli</i> Duncan	..	X	--	X	--	--	X	--	--	--	--	--	--	--	--	--
																Occurs probably throughout
<i>Tubastraea aurea</i> (Q & G)	..	X	X	X	X	X	--	--	--	X	X	--	--	--	--	--
<i>Dendrophyllia minuscula</i> Bourne	..	X	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	..	X	--	--	--	--	--	--	--	--	--	--	--	--	--	10 mts.
<i>Turbinaria crater</i> (Pallas)	..	X	X	--	X	--	--	X	--	--	--	--	--	--	--	X
<i>T. peltata</i> (Esper)	..	--	X	X	X	X	X	X	--	--	X	--	--	X	X	X

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THE CORAL FORMATIONS OF THE GULF OF KUTCH

The coral formations of the Gulf of Kutch is found between the 69° to 70°E, and 22°20' to 22° 40' N. along the coast of Jamnagar District of the Gujarat State (Fig. 1). The climatic conditions of this area have been recently summarised by Pillai *et al.* (1979). Raised reefs with massive coralla of faviids and *Porites* were observed near the Okha Railway Station during 1978. Well-formed reefs of any kind are not seen here except at Pirotan Island. It was believed that the coast of Gujarat has been subjected to local tectonic activities during Holocene. Dating of coral samples from the raised beaches of Okha (elevation 0.8 m) and Salaya (0.8 m) has yielded an age of 45,000 yrs. B.P. and 5220 ±105 yrs. B.P. respectively (Gupta, 1972). Gupta (1972) concluded that the 'inland coral reefs and raised beaches of the Saurashtra Coast are the remnants of a former high sea-level stands rather than an indication of the recent uplift of the coast.' This conclusion argues against the instability of this area. Whether the uplift of the fossil corals of this area are due to local tectonic upheavals or eustasy, the present-day coral growths are observed on wave cut banks covered with loose boulders as in Paga and Boria. Pirotan Island has a well developed fringing reef, though nothing comparable to a lagoon is present.

The eastern and south-eastern shores of Okha Point have elevated sandstones with distinct zonation of barnacles, molluscs and tube-dwelling polychaetes (Pillai *et al.* 1979). The area is with a high rate of silting, but at the subtidal zones many corals of the genera *Favia*, *Favites*, *Goniastrea*, *Platygyra*, *Pseudosi-*

derastrea and *Acanthastrea* are found. The colonies are scattered. The Laku Point further east of Adathra also is found to have a few colonies of corals. The two ahermatypes, viz. *Polycyathus verrilli* and *Tubastrea aurea* were also collected from here. Opposite to the Poshitra Point there is a small chain of banks and tiny islands. At the south the three islands, Dhabhdaba, Lefa and Dholio are located. The eastern shore of Dhabhdaba has scattered growth of corals such as *Goniastrea pectinata*, *Cyphastrea serialia* and *Symphyllia radians*. The Lefa Island has a thick vegetation of *Aleo vera*. *Favites complanata* and *Turbinaria peltata* were observed at the intertidal zones. At Dholio, eroded sand stones at the intertidal zones harbour isolated coral colonies. Gugar lying adjacent is mostly submerged at high tide. The surface is strewn with loose boulders of sandstones. Between the boulders *Montipora* spp., *Coscinaraea monile*, *Goniopora* spp., *Favia fava* and *Porites lutea* are common along with a few other species. A notable feature is the profusion of *Symphyllia* among alcyonarians and other algae.

Paga, Savaj, Mangunda, Boria and Dona lie north of Gagur. All these are submerged at high tide. The morphology of Paga and Boria was already described in detail (Pillai *et al.* 1979). The southern shores of Savaj and Mangunda were found to have a fairly rich growth of *Porites* and faviids. Manmarudi and Langamarudi are two tiny islands located west of Ajad. The shores are steep cut with eroded sandstones. A few *in situ* dead colonies of *Acropora* could be seen in deep waters of Langamarudi an indication that the genus thrived here till recently. Ajad is inhabited. The corals found include *Montipora* spp. *Porites* spp. *Pseudosiderastrea tayami*, *Cyphastrea serialia*, *Acanthastrea simplex* and a few faviids. Bural is large and has a thick coverage of mangroves. The growth of corals is relatively poor though, *Favia fava*, *Hydro-*

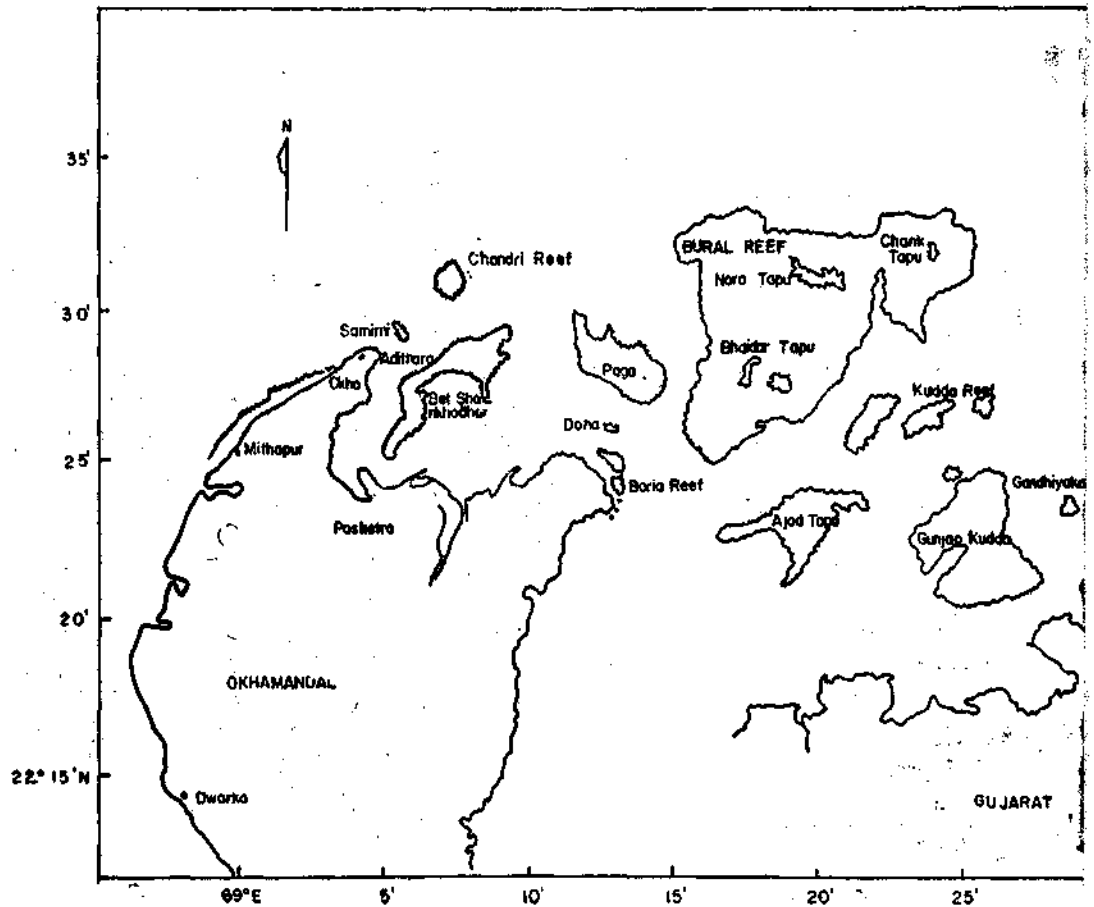
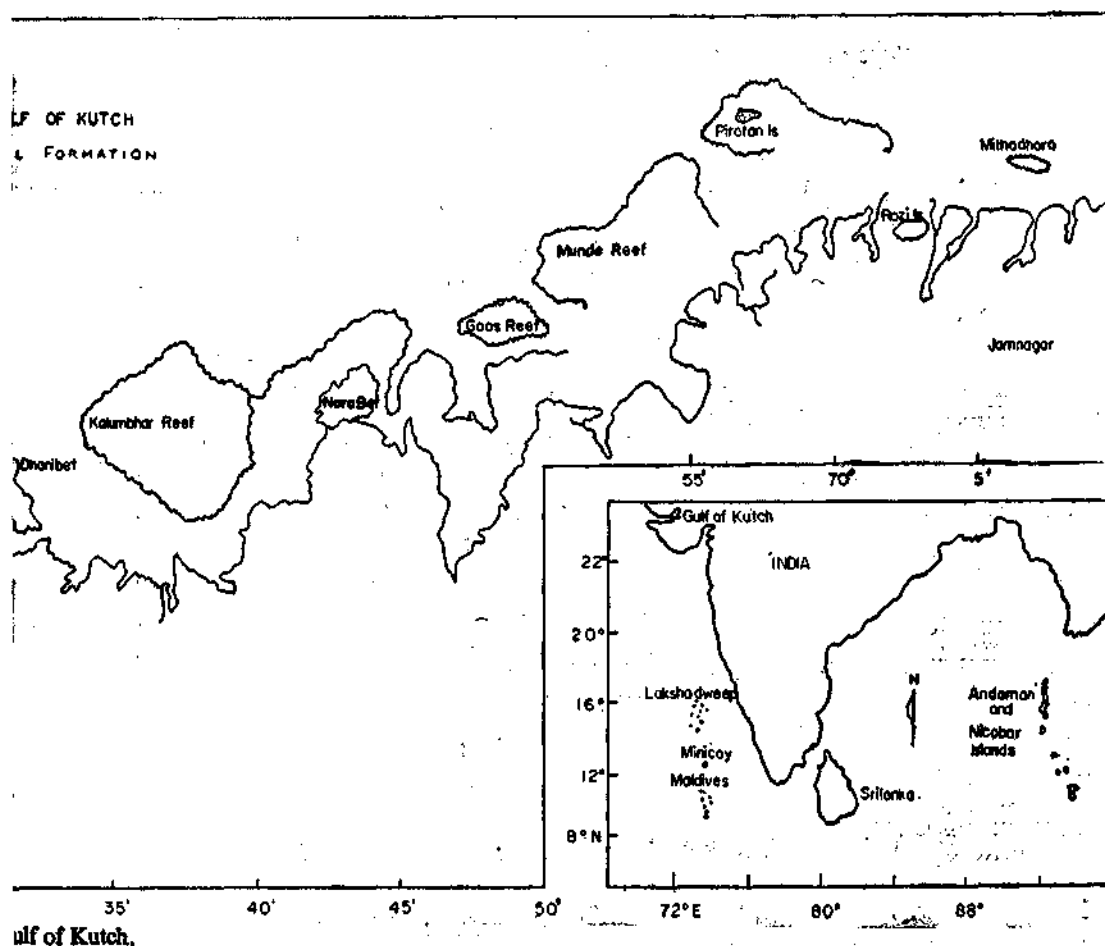


FIG. 1.

phora exesa, and *Psammocora digitata* and *Porites compressa* were collected.

Dhani and Kalumbar are small islands situated north of Salaya. Both have shrubby mangroves. The intertidal zones have isolated coral colonies. These include *Favia fava*, *Favites complanata* and *Pseudosiderastrea tayami*. An interesting observation was the presence of *P. tayami* in very shallow creeks extending to mangroves where the silting rate was very high. The Narara Point at the north-west of Sikka on the mainland coast has mangroves. The corals and coralline sand from this area were quarried in large quantities in the past and it was not possible to assess the natural intensity of coral formations. Isolated colonies of

Acanthastrea simplex, *Goniopora nigra*, *Goniastrea pectinata* and *Porites lutea* were collected. The Goose Reef at the north of Sikka gets exposed at low tides and has a sand dune as in Paga. The surface is with eroded boulders. Sargassam was found in great profusion. *Platygyra*, *Favia* and *Hydnophora* were also found. Pirotan Island forms the eastern limit of major coral formations in the Gulf of Kutch with a well developed reef. A fairly detailed account of the coral formation of this island is already given by Pillai *et al.* (1979). It was observed in 1978 that large quantities of massive *Porites* and faviids were removed from the reefs for many purposes which has depopulated the island to a large extent.



IMPACT OF ENVIRONMENT ON CORAL FAUNA

Latitudinal difference, geographic isolation, extreme conditions of environmental parameters are some of the factors that are believed to have great impact on the natural growth of corals in an area. The Gulf of Kutch forms almost the northern limit of coral formations in the Indian Ocean, but for the northern portions of the Red Sea. The coral fauna of the Red Sea is found to have a total of 64 genera of which 56 genera occur in the Gulf of Aquaba (Scheer and Pillai, 1983). The Gulf of Kutch lying further south is known to have only 24 genera, while the Maldives still south is reported to have 75 genera, in its coral faunal list (Pillai and Scheer, 1976). This

is an indication that the latitudinal difference is not the major factor that restrict the generic diversity in the Gulf of Kutch. Geographic isolation is also a factor. It has been pointed out that Persian Gulf — a highly isolated coral province is known to have only 15 genera of reef corals (Scheer, 1985). But Scheer (1985) opined that the paucity of coral genera in the Persian Gulf is chiefly due to the extreme environmental parameters (water temperature 16° to 40°C; salinity 48‰) rather than geographic isolation. The Gulf of Kutch is one of the most isolated areas as far as coral growth is concerned, the nearest formation being the Maldivé-Lakshadweep Archipelagoes. As already pointed out, a

total of 24 genera hitherto known from this area seems to reflect a real picture of the fauna since collection was more or less intense, though deeper zones were never studied. The area is under heavy silting and most of the genera recorded have large polyps that can combat the deleterious effect of silting (Pillai, 1971). It is apparent that prolonged exposure due to high tidal fluctuations coupled with high incidence of fine silting are the major factors that puts natural constraints on coral growth in the Gulf of Kutch. The absence of *Acropora* (at present), *Pocillopora*, *Stylophora* and relative paucity of *Montipora* accounts mainly for the low number of species recorded from this Indian Ocean area.

DESCRIPTIONS OF SPECIES

Order : SCLERACTINIA Bourne, 1905

Suborder : ASTROCOENIINA Vaughan and Wells, 1943

Family : THAMNASTERIIDAE Vaughan and Wells, 1943.

Genus *Psammocora* Dana, 1846

Type species : *Pavona obtusangula* Lamarck, 1816.

Generic characters : Encrusting, explanate, submassive or ramose. Corallites close together, intercorallite wall absent; septa ramifying at the periphery, confluent between centres with teeth on edges. Axial fossa with a central columella style. Corallites sometimes in short valleys.

There is a paucity of this genus in the Gulf of Kutch. Only one specimen was collected as described below.

Psammocora digitata Milne Edwards and Haime, 1851 (Pl. I D)

Psammocora digitata Edwards and Haime. Veron and Pichon, 1976. p. 30, figs. 33-38 (synonymy).

Psammocora togianensis Pillai and Scheer, 1976, p. 19, pl. 1, fig. 2. (synonymy).

Corallum with thick digitiform branches arising from a base. The present specimen represents the distal part of a branch, 6 cm in height and 6 cm in thickness. Calices, superficial, adjacent ones 2.5 to 3 mm apart when measured between columella centres. Axial fossa about 1 mm in diameter. Septa alternating in size, petaloid, tri or bi-furcating at the periphery, 6 to 8 septa reach columella. Septal edges with frosted teeth. Axial fossa with a central vertical columella style.

Locality : Bural.

Distribution : ? Red Sea ; Seychelles ; Gulf of Kutch ; Lakshadweep ; Maldives, Malacca ; Australia ; Philippines ; Solomon Islands Marshall Islands ; Caroline Islands.

Remarks : *Pavona explanulata* (Scheer and Pillai, 1983) is likely to be the initial growth form of this species and may be one and the same.

Family : ACROPORIDAE

Genus *Acropora* Oken, 1815

Type species : *Millepora muricata* Linnaeus, 1758.

Generic characters : Mostly ramose, rarely encrusting, the tip of branches with an axial corallite that buds off radial corallites. Corallum porous. Septa in two cycles. A true columella absent. Radial corallites immersed or projecting.

Remarks : The genus was not found in shallow waters of the Gulf of Kutch in living condition. Dead branches found on Paga and Boria are identified as follows.

SYNOPSIS OF ACROPORA

1. Caespitose with digitiform branches. Axial corallites cylindrical, 2 to 4 mm long and 3 to 6 mm thick. Radials nariform, labellate or immersed, 2 to 4 mm long and broad. *A. humilis* (Dana)

2. Subarborescent. Axial corallites conical, 2 to 3 mm thick at the top, about 6 mm at the base. Radials nariform, scattered, 2-3 mm long. Immersed corallites dominant. Surface echinulate

..... *A. squarrosa* (Ehrenberg)

***Acropora humilis* (Dana), 1846 (Pl. I A)**

Acropora humilis (Dana), Scheer and Pillai 1983, p. 40, pl. 7, figs. 5, 6 (synonymy).

Acropora plantaginea (Lamarck) Pillai, 1986, p. 130, pl. 3, fig. 3, pl. 4, fig. 2 (synonymy and description).

Localities : Paga, Boria.

Distribution : Widespread species from the Red Sea to Tuamotu Archipelago and Hawaii in the Indo-Pacific.

Remarks : In a recent paper Pillai (1986) described this species under the specific name *plantaginea* since it was found that one of Lamarck's (1816) specimens in the Natural History museum of Paris was the same as *humilis* Dana. However, as pointed out by Brook (1893) the specific name *plantaginea* was applied by early workers for a heterogeneous assemblage of *Acropora* and should sink into oblivion.

***Acropora squarrosa* (Ehrenberg), 1834**

Acropora squarrosa (Ehrenberg), Scheer and Pillai, 1983, p. 44, pl. 8, figs. 3, 4 (synonymy and description).

Remarks : Detailed description of the species is found in Brook (1893). A branch obtained from the shingle at Boria is referred to this species.

Distribution : Red Sea ; (Type locality) ; Seychelles ; Maldives, Gulf of Kutch. The records of this species from Pacific by Vaughan (1918) and Veron and Wallace (1984) need further confirmation.

Genus *Montipora* de Blainville, 1830

Type species : *Montipora verrucosa* Quoy and Gaimard, 1833.

4-b

Remarks : Though Bernard (1897) assigned the authorship of this genus to Quoy and Gaimard, the first mention of the generic name was by Blainville and following Scheer and Pillai (1983) the authorship of the present genus is given to de Blainville.

Generic characters : Encrusting, explanate, submassive, ramose or foliaceous. Axial corallite absent. Septa in two cycles. Surface coenosteum smooth, foveolate, papillate or tuberculate.

Remarks : The classification or grouping of various species of *Montipora* follows Bernard (1897) rather than that of Veron and Wallace (1984).

SYNOPSIS OF *MONTIPORA*

1. *Glabrous or smooth*

Corallum explanate and encrusting. Corallites 0.5 to 0.8 mm in diameter. Second cycle of septa incomplete. Living coral yellowish-brown *M. explanata*

2. *Foveolate Montipora*

(a) Encrusting to submassive. Surface lobulated. Calices 0.5 to 0.7 mm in diameter with poorly developed thecal wall. Second cycle of septa incomplete.....*M. turgescens*

(b) Encrusting to submassive. Calices conspicuous, about 1 mm in diameter with solid thick wall. Septa 12. Coenenchyme forms ramparts around corallites.....
..... *M. venosa*

3. *Papillate Montipora*

Encrusting, growing layer over layer. Surface with hillocks. Calices 0.6 to 0.8 mm in diameter. Septa in two complete cycles. Papillae single or two to three fuse to form small ridges. Individual papillae 1 to 1.5 mm thick at the base and 2 to 3 mm high.
..... *M. monasteriata*

4. *Tuberculate Montipora*

(a) Encrusting. Surface with crowded digitiform branches. Calices 0.7 to 0.8 mm in diameter. Septa 12. Primary septa fuse at the centre of the axial fossa. Tubercles 1 mm high and thick, 6 to 8 around a calyx sometimes fusing to form ridges.....
..... *M. hispida*

(b) Foliaceous. Calices 0.3 to 0.5 mm in diameter. Tubercles at the periphery of the folia forms long ridges by fusion.....
..... *M. foliosa*

Montipora explanata Brueggemann, 1879
(Pl. IV C)

Montipora explanata Brueggemann Pillai, 1986, p. 135 (synonymy).

Remarks: For a detailed recent description of the species reference may be made to Pillai (1986). The species was found fairly common both at Paga and Boria forming encrusting coralla.

Distribution: Mauritius (Type locality); Rodriguez; Gulf of Kutch; Gulf of Mannar.

Montipora turgescens Bernard, 1897 (Pl. I B)

Montipora turgescens Bernard, Scheer and Pillai, 1974 p. 14; Veron and Wallace, 1984, p. 39, figs. 82-93 (synonymy).

Only one specimen was present in the collection. Encrusting, greater spread 9 cm. Surface forms crowded lobulations. Calices crowded, 0.5 to 0.7 mm in diameter, wall thin. First cycle of septa prominent and vertically descending, secondaries 3 to 4. Surface coenenchyme foveolate. Under the lens looks spiny.

Locality: Paga.

Distribution: Gulf of Mannar; Gulf of Kutch; Nicobar Islands; Great Barrier Reef (Type locality); Solomon Islands; Philippines; China Sea; Marshall Islands; Ellice Islands.

Remarks: The species is very near to *M. venosa* (vide infra) but is told separate by its smaller calices and weakly developed foveolations.

Montipora venosa (Ehrenberg) 1834
(Pl. I C, II A)

Montipora venosa (Ehrenberg). Pillai, 1986, p. 139 (synonymy and description%).

Remarks: The present collection includes four specimens from Paga and Boria where it was found fairly common. The calices are very conspicuous deep and open with 12 septa. Foveolations around the calices dominant making the calices funnel-shaped. Thecal wall solid. Though, Bernard (1897) treated this species under papillate group; Veron and Wallace (1984) correctly placed it under foveolate forms which is strictly followed here.

Montipora monasteriata (Forskål), 1775
(Pl. III B)

Montipora monasteriata (Forskål), Pillai, 1986, p. 138 (synonymy and description).

Montipora sinensis Bernard 1897, P. 109, pl. 19, fig. 3. *Montipora fungiformis*. Bernard, 1897, p. 80, pl. 12, fig. 2.

Encrusting layer over layer. Surface with gibbositities. Calices 0.7 to 0.8 mm in diameter with a prominent directive septa. Papillae 1 to 2 mm in size often a few fusing to form excrescens.

Localities: Paga, Boria.

Distribution: Red Sea; (Type locality) Aldabra; Gulf of Kutch; Mascarenes; Gulf of Mannar; Great Barrier Reef; Samoa; Fiji and Hawaii.

Montipora hispida (Dana), 1846 (Pl. IV A)

Montipora hispida (Dana). Pillai, 1986, p. 143 (synonymy and description).

The present specimens are all encrusting without typical branches of the species, pro-

bably a positive response to prolonged exposure. The details of the present specimens are in perfect agreement with Bernard's (1897) description of *M. informis* a synonym of this species.

Localities : Paga and Boria.

Distribution : Widespread from Persian Gulf (Type locality) to Tahiti.

Montipora foliosa (Pallas), 1766 (Pl. II C)

Montipora foliosa (Pallas). Pillai, 1986, p.144, pl. 6, fig. 1 (synonymy).

The species is characterised by large fronds arranged in the form of rosette, but the fronds may grow in layer over layer in a horizontal form or may grow as encrustations in shallow waters with prolonged exposure (Pillai, 1986). The present specimens are all encrusting or horizontal folia with free margins. Undersides of free edges possess rounded pendant like growths. Fronds 4 to 5 mm thick. At the calicular side the growing edges of corallum has long ridges formed by fusion of tubercles.

Localities : Paga and Boria.

Distribution : Widespread Indo-Pacific species.

Remarks : In a recent account Veron and Wallace (1984) have drawn up a long list of synonymy for this species which includes, *M. prolifera* Brueggemann, *M. minuta*, *M. pulcherrima*, *M. tubifera*, *M. variabilis* *M. scuttata* (all of Bernard, 1897) and *M. undans* and *M. sulcata* (of Crossland, 1952). However, all these species are characterised by very high ridges, sometimes formed of the fusion of papillae rather than tubercles and form a series broken from *M. foliosa*.

Suborder : FUNGIINA Verrill, 1865

Superfamily : AGARICHAEE Gray, 1847

Family : SIDERASTREIDAE de Blainville, 1830

Genus *Siderastrea* de Blainville, 1830

Type species : *Madrepora radians* Pallas, 1766.

Generic characters : Encrusting to sub-massive. Corallites polygonal, cerioid. Two rows of synapticulae. Septa undergo fusion. Edges of septa toothed, sides granular. Budding extratentacular. Columella papillary.

Siderastrea savigniana Milne Edwards and Haime, 1850 (Pl. XIII C)

Siderastrea savigniana MED.-H. Pillai, 1986, p. 150 (synonymy).

The following details are based on specimens from Adathra Reef, Okha. Coralla explanate, Corallites polygonal, tetra to hexagonal, cerioid, wall acute, 3 to 4 mm long and 2-3 mm broad. Smaller corallite intercalated. Septa 25 to 30, equal thickness at wall, slightly exsert. 12 septa reach columella, higher cycles unite to lower ones. Primary cycle of septa without any fusion directly reaching columella. Columella a compressed style. Two rows of synapticulae within wall.

Distribution : Red Sea ; East Africa ; Madagascar ; Gulf of Kutch ; Gulf of Mannar and Palk Bay ; Mergui Archipelago.

Genus *Pseudosiderastrea* Yabe and Sugiyama, 1933

Type species : *Pseudosiderastrea tayami* Yabe and Sugiyama.

Generic characters : Growth form and nature of corallites almost similar to *Siderastrea*. But corallites relatively larger with only one ring of synapticula. Budding extratentacular.

Pseudosiderastrea tayami Yabe and Sugiyama, 1933 (Pl. IX B)

Pseudosiderastrea tayami Yabe and Sugiyama. Pillai, 1986, p. 151, pl. 8, fig. 3 (synonymy and description).

Localities : Adathra, Port Okha, Pirotan Island.

Distribution : Western Indian Ocean ; Gulf of Kutch ; Gulf of Mannar ; Westcoast

of Kerala ; Andamans ; Celebes ; Aru Island, Great Barrier Reef.

Genus *Coscinaraea* Milne Edwards and Haime, 1848

Type species : *Astrea monile* Forskål, 1775.

Generic characters : Encrusting to submassive. Corallites mono to polystomodaeal, sometimes placed within short valleys. Thecal wall not well defined. Septa branching at the outer periphery of the calyx, confluent between centres with dentate edges, sides granular. Smaller septa fuse to larger ones.

Coscinaraea monile (Forskål), 1775
(Pl. XIII D)

Coscinaraea monile Forskål. Pillai, 1986, p. 153 (synonymy).

Larger specimens in the field measured upto 25 cm in greater spread. Corallum encrusting sometimes over growing dead lower layer. Edges free and costate. Corallites mono to tristomodaeal sometimes placed within short valleys. Distance between adjacent columella centres 4 to 6 mm, depth of calyx about 3 mm. Septa confluent between centres, bi to trifurcating, 30 to 40 septa around a calyx of which 8 to 12 reach columella. Others undergo fusion. Axial fossa about 1 mm in diameter with single or two to three vertical papillae.

Localities : Adathra Reef, Paga, Boria and Pirotan Island.

Distribution : Red Sea (Type locality) ; Somaliland ; Aldabra ; Re-Union ; Mauritius ; Maldives ; Gulf of Mannar ; Gulf of Kutch ; Sri Lanka ; Mergui Archipelago.

Superfamily : *PORITICAE* Gray, 1842

Family : *PORITIDAE* Gray, 1842

Genus *Goniopora* de Blainville, 1830

Types species : *Goniopora pedunculata* de Blainville, 1830.

Generic characters : Colonial, encrusting, massive or columnar and ramose. Corallites polygonal or circular with three cycles of septa. Wall and coenostem porous. Columella trabecular.

SYNOPSIS OF *GONIOPORA*

1. Corallum submassive or columnar. Calices 3 to 5 mm in diameter. Three cycles of septa complete, the first two cycles with pali..... *G. planulata*
2. Corallum encrusting to submassive. Calices 2 to 3 mm in diameter. Third cycle of septa mostly incomplete. Pali may or may not be present on the primary septa *G. minor*
3. Corallum thick and explanate. Corallites and calices polygonal. Septa in three cycles, almost straight from wall to columella. Calices 2 to 2.5 mm in length and width. Corallum dark brown in living condition *G. nigra*

Goniopora planulata (Ehrenberg), 1834
(Pl. III A)

Goniopora planulata (Ehrenberg). Pillai, 1986, p. 155, pl. 8, fig. 1 (synonymy and description.)

Two specimens are placed under this species. One of them is a thick encrustation resembling typical *G. lobata*. Corallites polygonal with circular calices 4 mm in diameter. Wall about 1 mm thick. The second specimen is a thick columnar growth (Pl. 3, fig. A). The details of this species is as given by Pillai (1986).

Locality : Paga.

Distribution : Red Sea (Type locality) eastward to Hawaii.

Remarks : Scheer and Pillai (1983) have drawn up a list of synonyms for the species. According to Veron and Pichon (1982) the type of *Astrea planulata* is lost and Ehrenberg's description is inadequate for identification

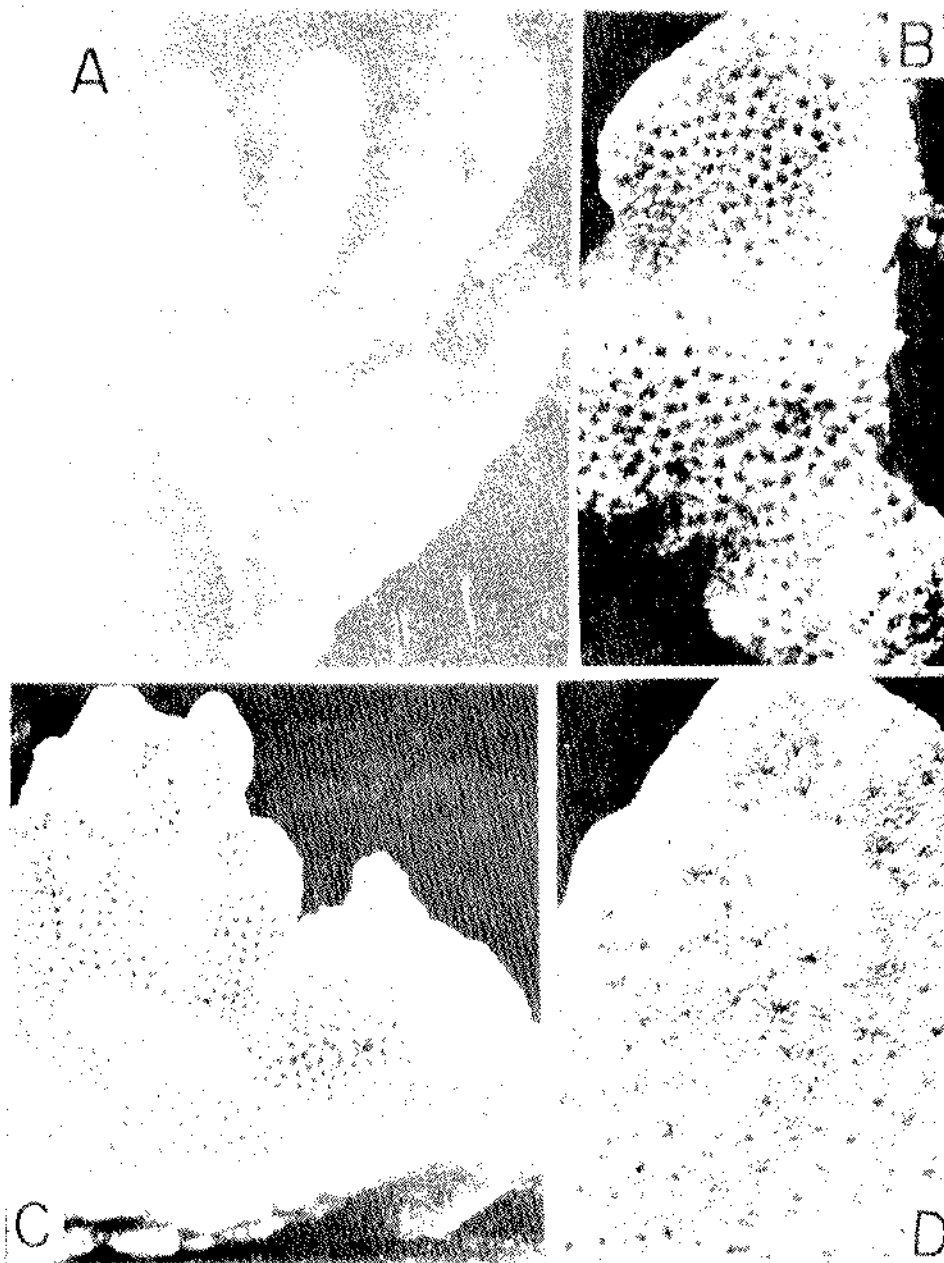


PLATE I. A. *Artemesia lutea* (S. Grun.) from Paris (X 15). B. *Artemesia lutea* (S. Grun.) (X 20). C. *Micropora tenuis* (X 7) and D. *Psammis undulata* (L.) (X 9).



PLATE II. A. *Montipora verrucosa* free lying colony (X 10). B. *Montipora nigra*, calices (X 25) and C. *Montipora lobosa*, underside (X 25).

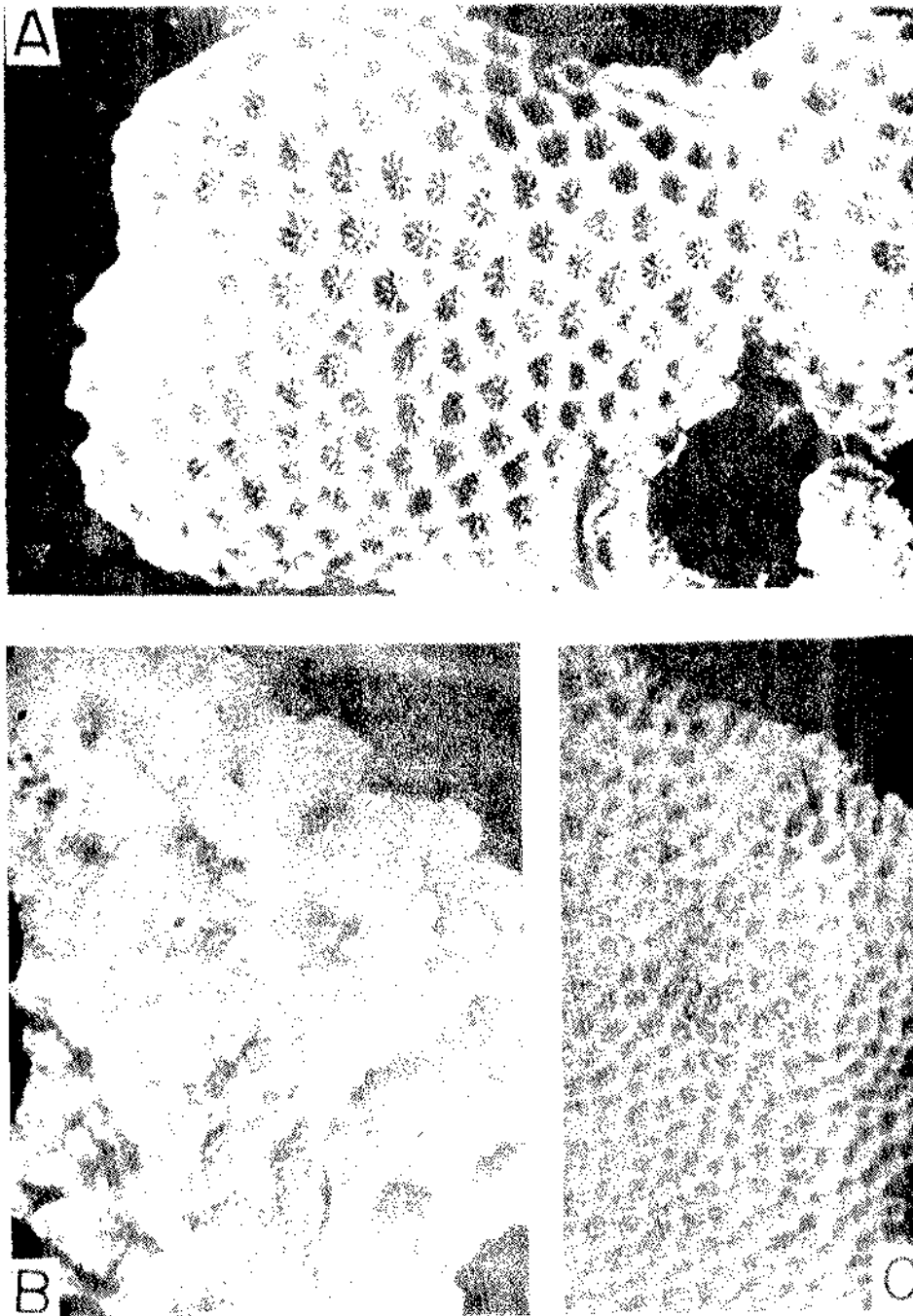


PLATE III. A. *Gomapora ulmaria* (X 720). B. *Madia* (*Scrupocellaria*) (X 1000). C. *Calves pollicaria* calices (X 900).

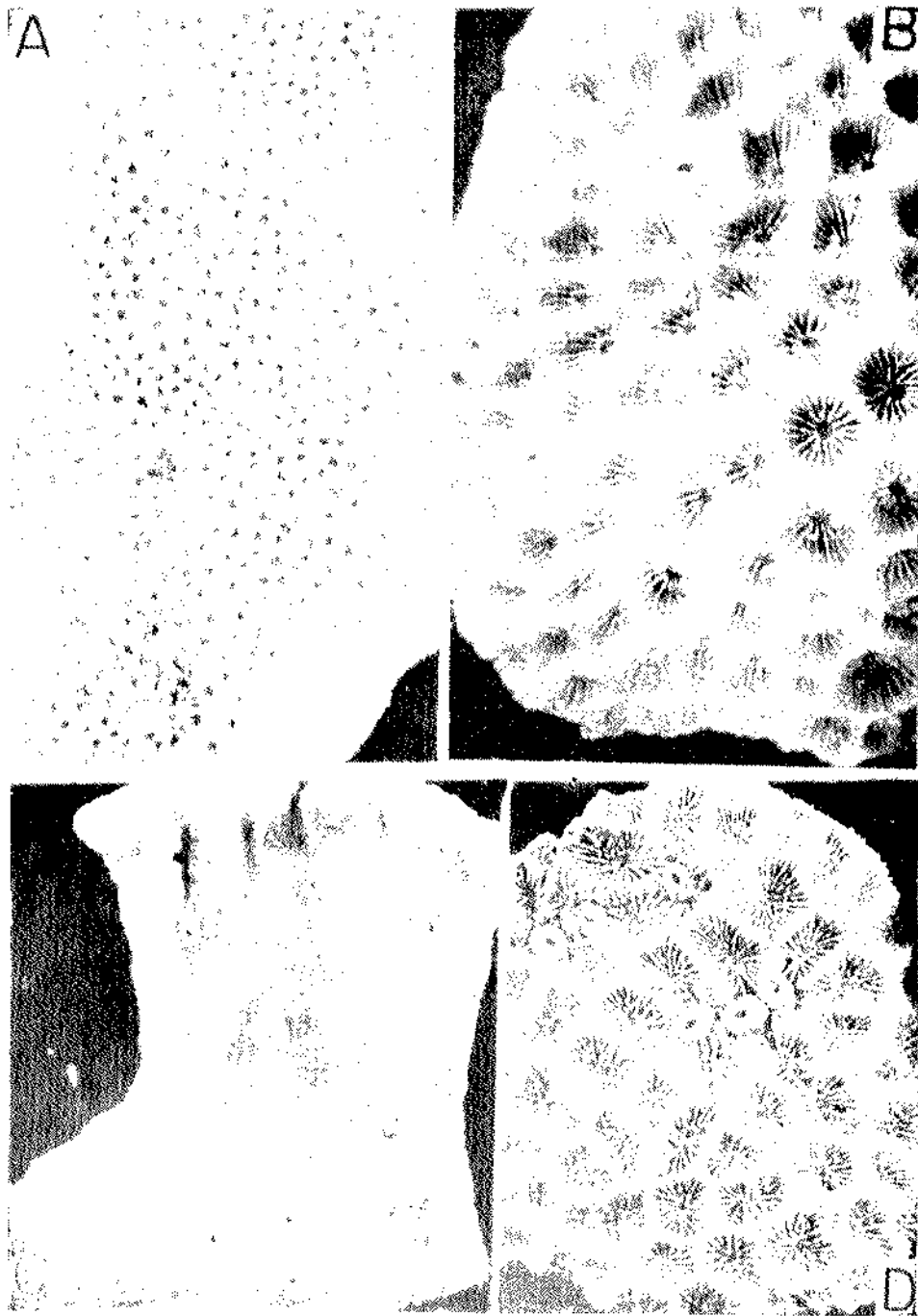


PLATE IV - A. *Montipora hispidula* salice (X 2). B. *Goniastrea pectinata* (X 1.5). C. *Montipora explanata* (X 0.75) and D. *Favites complanata* *Varia* *halimona* (X 1.2).



PLATE V. A. *Porites lata* (X 0.8). B. *Porites helian* (X 1). C. *Porites compressa* modular branches (X 1). D. Same expanded normal branch (X 1). E. Same a thick distal branch (X 1).

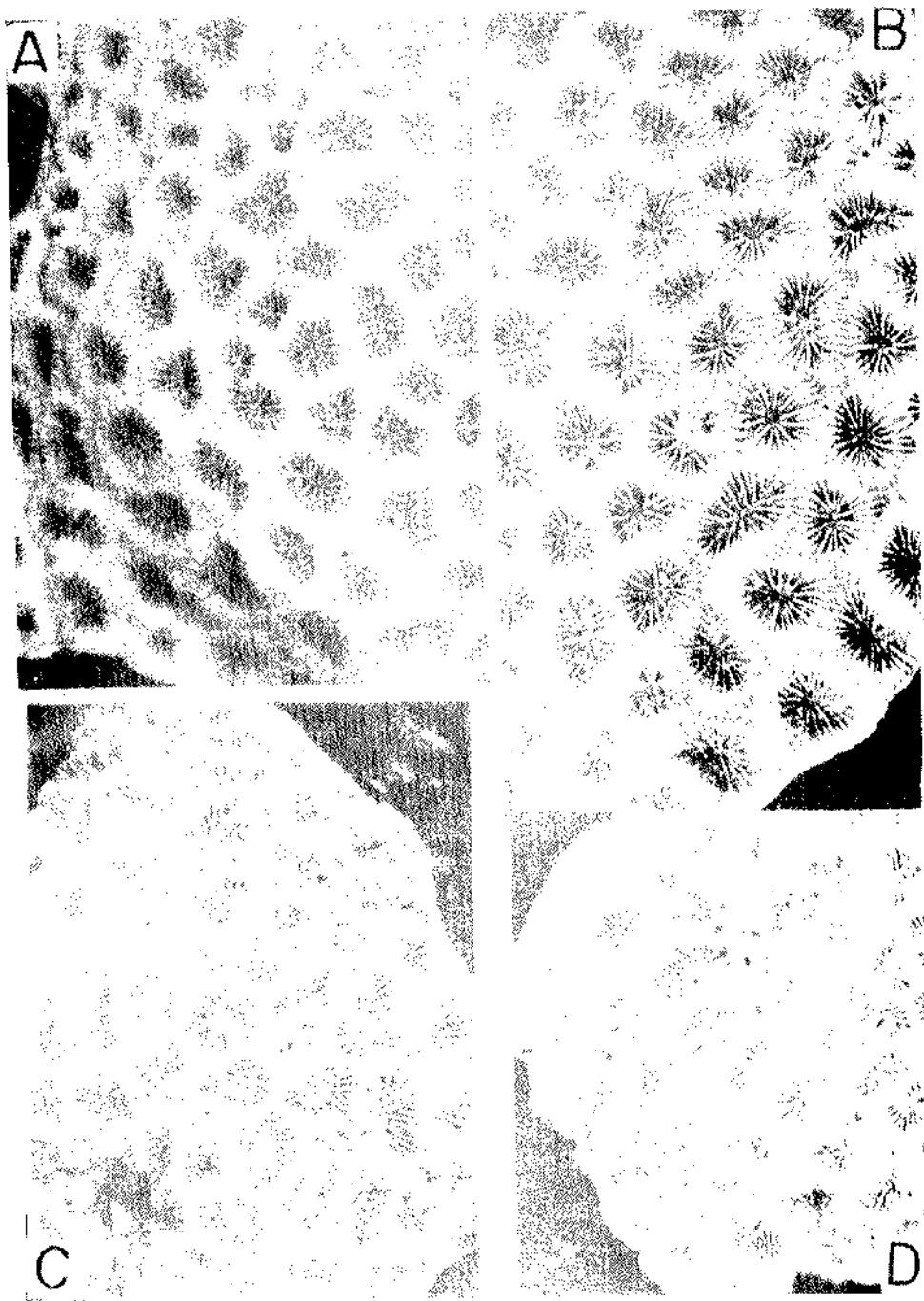


PLATE VI. A. *Larva hirsuta* with deep cuticle (X 11). B. *Larva hirsuta* with shallow cuticle (X 11).
C. *Larva complanata* (X 11) and D. *Larva complanata* (X 11).

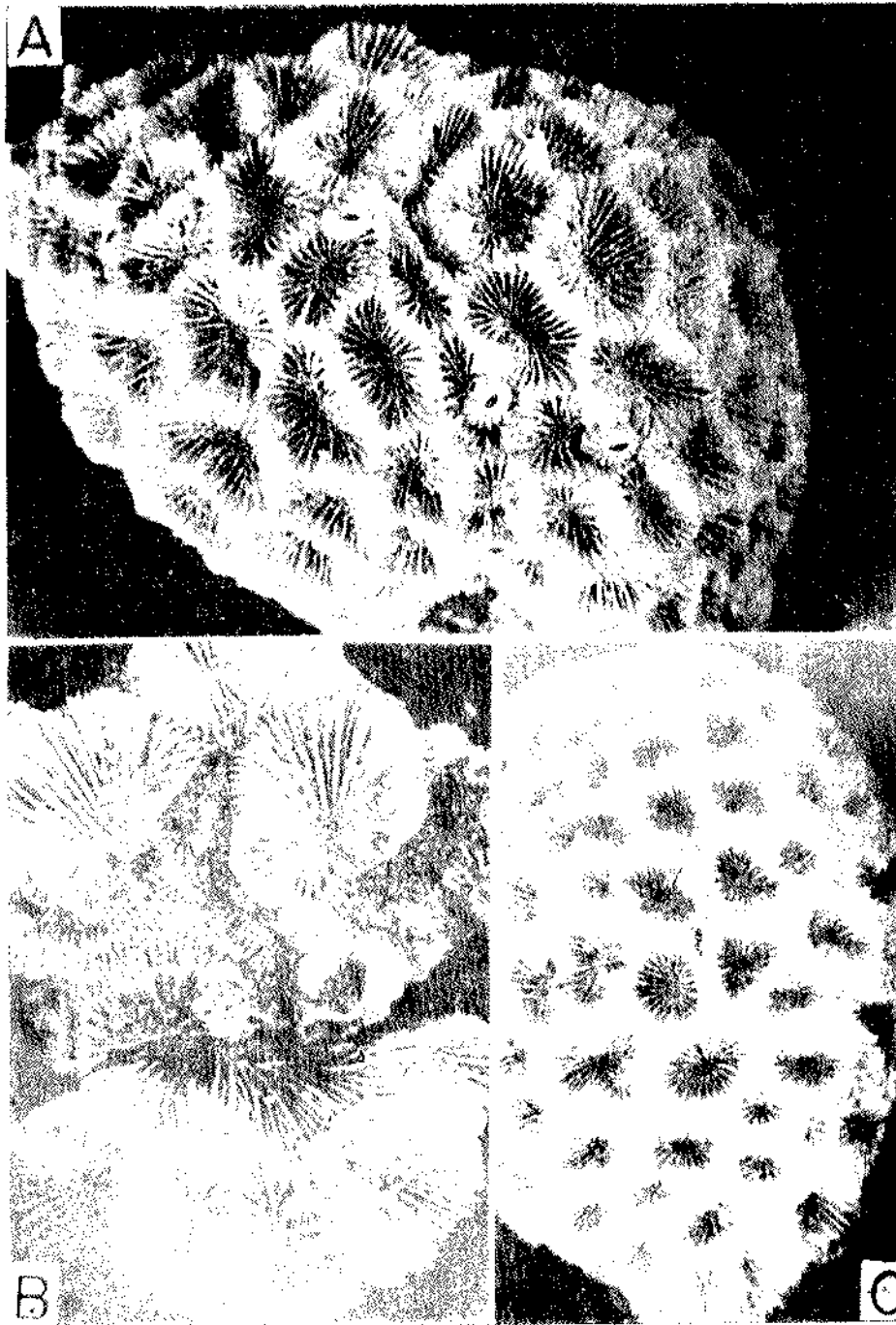


PLATE VII. A - *Lathes complanata* (N. L.) B - *Wanthospora simplex* (N. L.) and C - *Lathes latus* (N. L.)

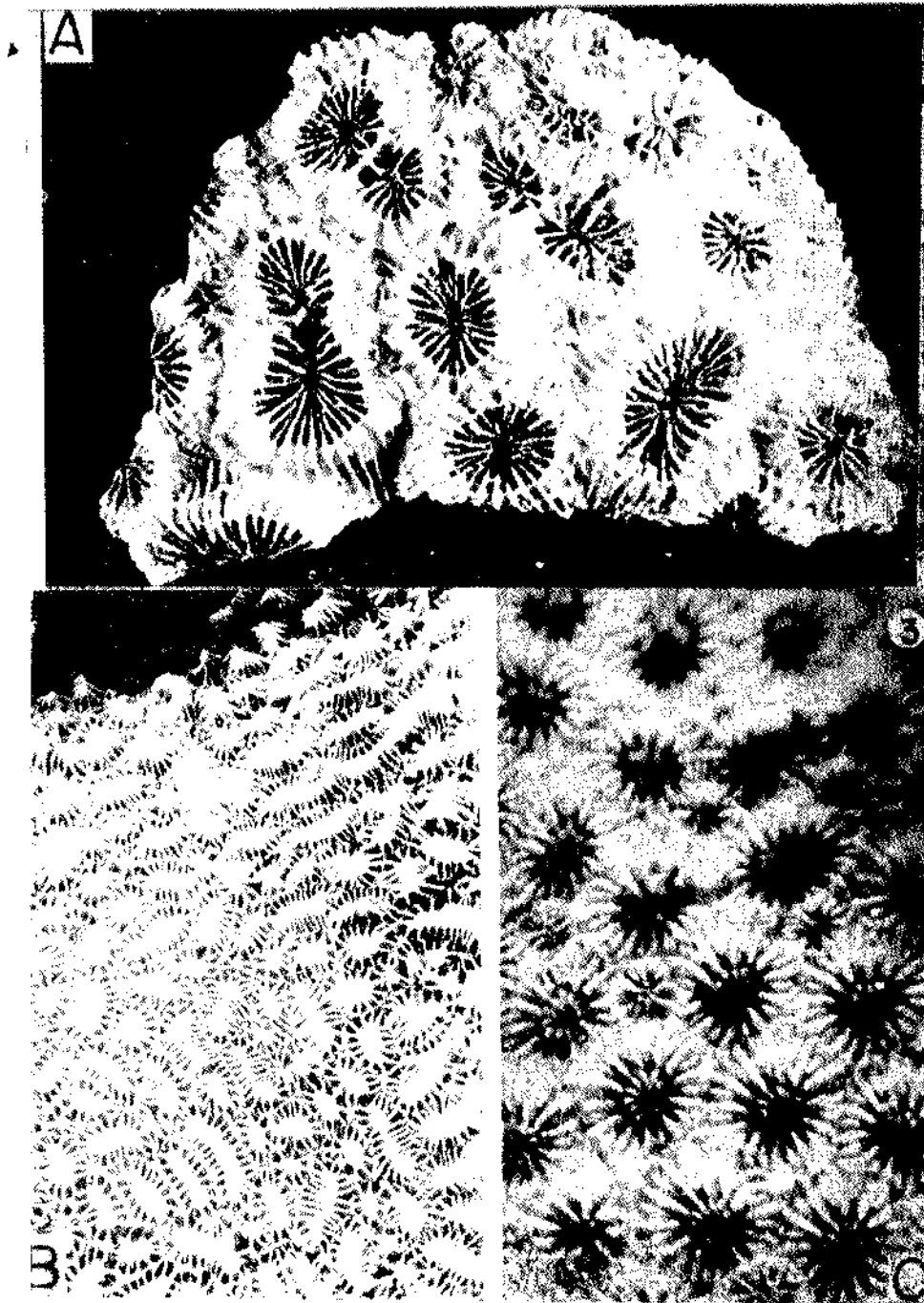


PLATE VIII. A, *Favos speciosa* (X 1.5); B, *Hydophora exsca* (X 1.25) and C, *Plectoarea corymbosa* (X 5).



PLATE IX. A. *Gammarus medusae* (G.O.S.) Fig. B. *Psudoceroscerus* (G.O.S.) and C. *Desmophylax furcata* (G.O.S.)

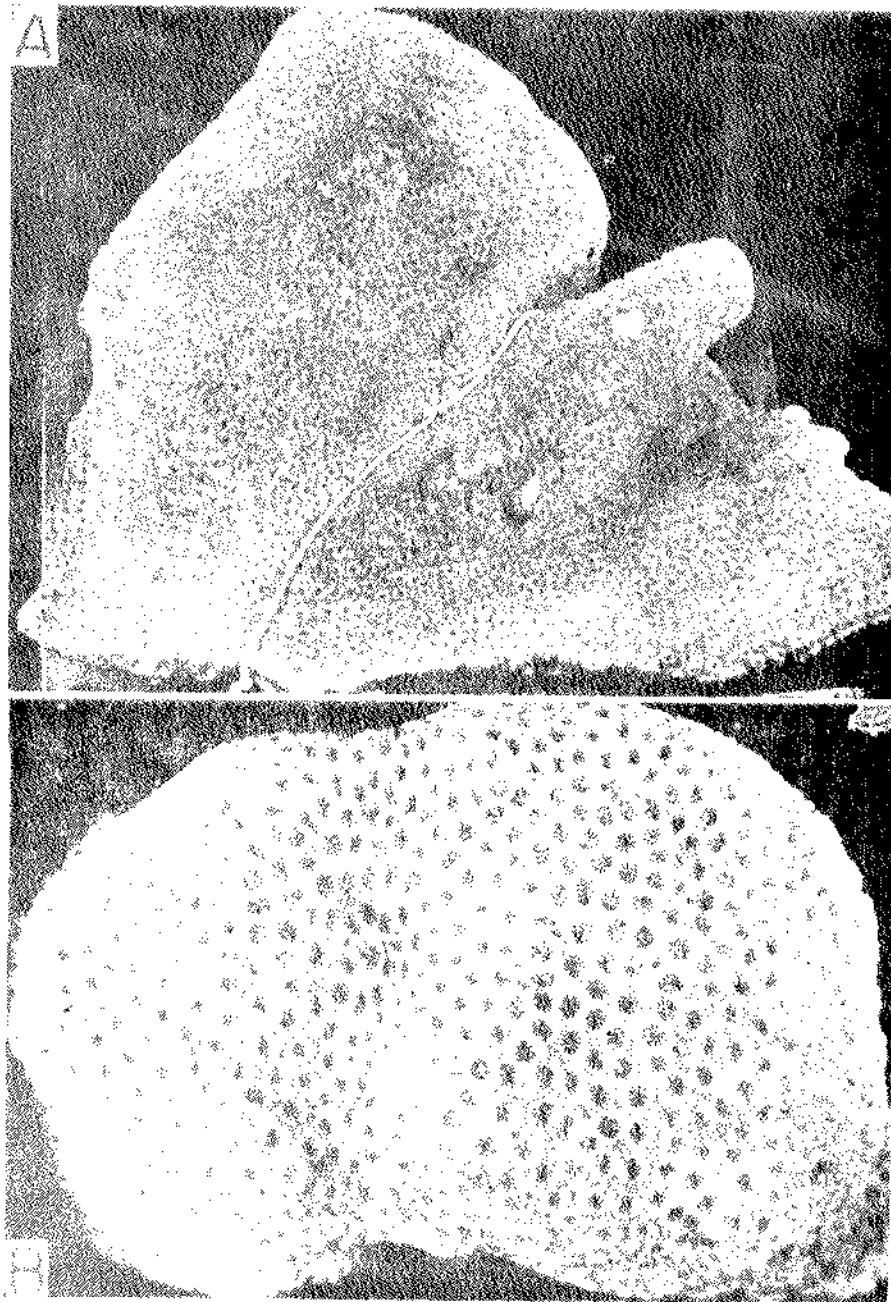


PLATE X. A. *Tubipora* (N. O.) and B. *Cyathina* (N. O.).

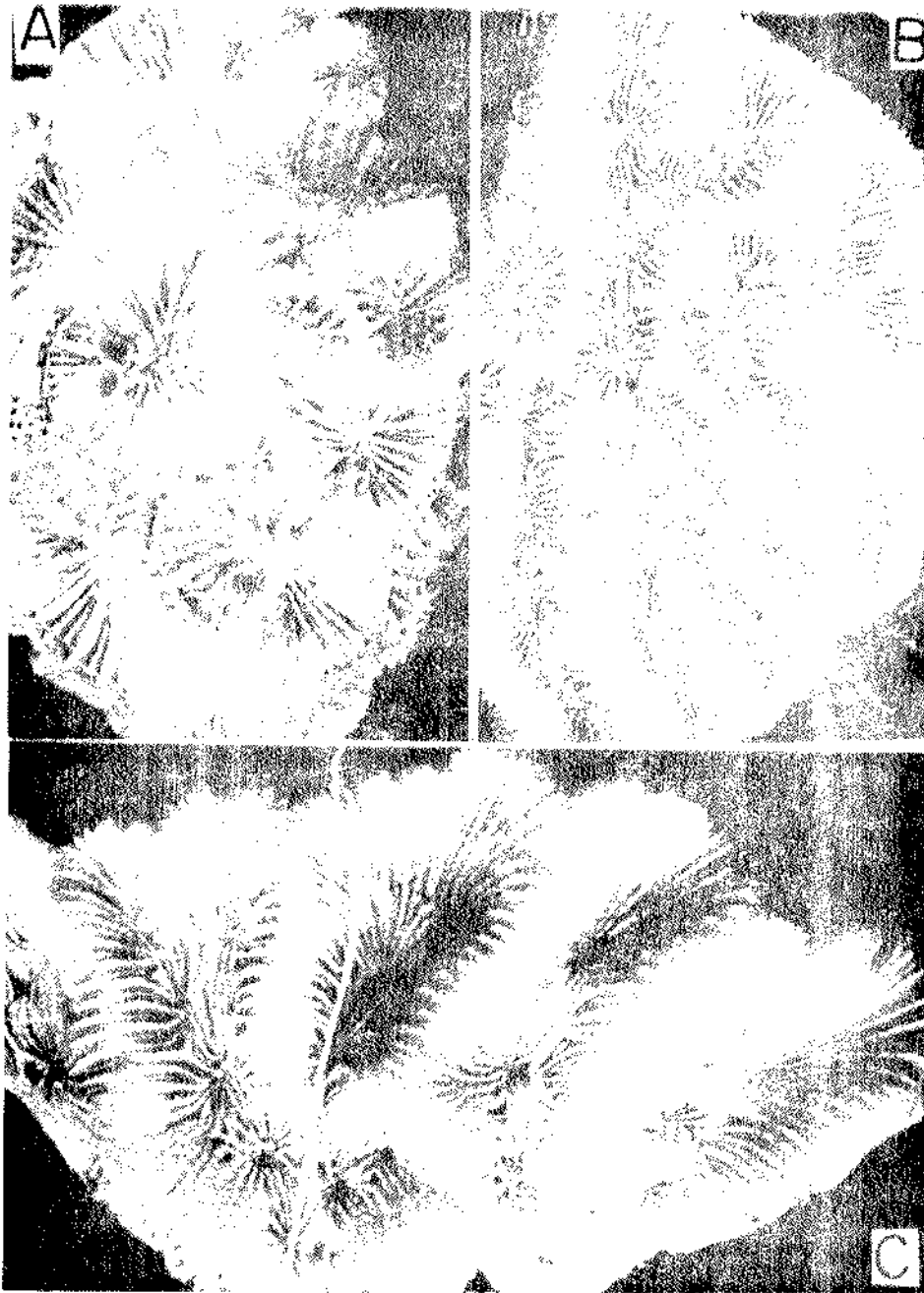


PLATE XI. A. *Leptobesius simplex* (N. L.) B. *Synthella radialis* (N. L.) var. C. *Synphyllactonans* (N. L.)



PLATE XII. A, *Tadinaea pilula* (C. L.) (C.S.L.D.). B, *Platycyathopsis* (C.L.D.).
C, *Pora calyculata* (C.S.L.) (C.L.). D, *Tadinaea ovalis* (C.S.L.).

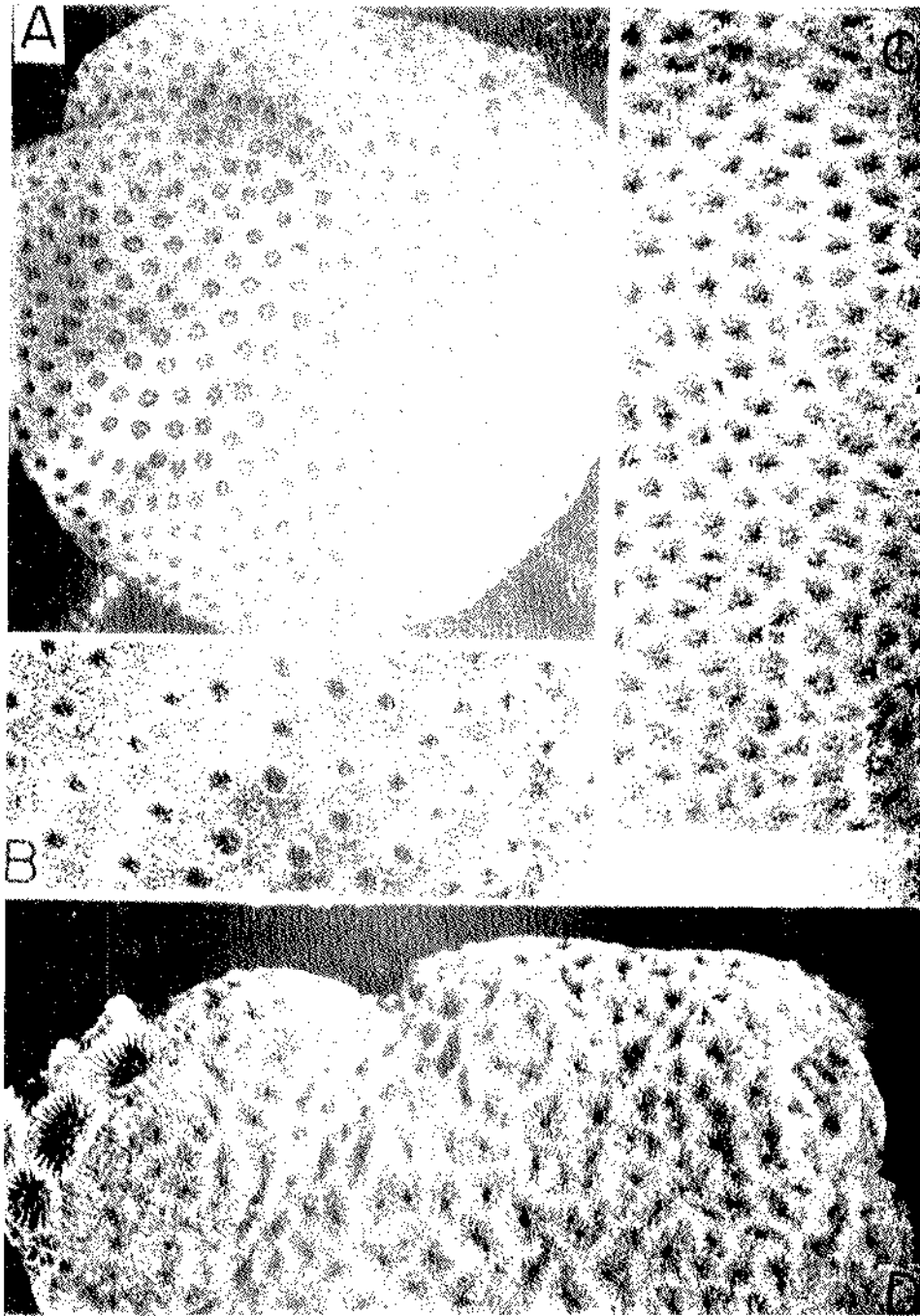


PLATE XIII. A. *Amphioxys pelagicus* (X 955), B. *Amphioxys concolor* (X 15),
C. *Sphaerostoma apertum* (X 27) and D. *Ceratopoda novae* (X 15)

hence the next available name *columna* Dana should be used. *G. columna* is regarded a synonymy of *G. planulata* by both Scheer and Pillai (1983) and Pillai (1986).

***Goniopora minor* Crossland, 1952**

Goniopora minor Crossland, 1952, p. 233, pl. 48, figs. 1, 2; Pillai and Scheer, 1976, p. 176, p. 48 (synonymy).

Small circular corallites with incomplete set of third septa. Pali is poorly developed. A detailed description of the species is found in Veron and Pichon (1982).

Localities: Paga, Boria and Pirotan Island. Fairly common with expanded polyps during day time.

Distribution: Red Sea to Philippines.

***Goniopora nigra* Pillai, 1969 (Pl. IIB, IXA)**

Goniopora nigra Pillai, 1969, p. 402, pl. 1, figs. 1, 2; Pillai, 1986, p. 156.

Locality: Paga, Boria and Pirotan Island.

Distribution: Gulf of Kutch, Gulf of Mannar, Great Barrier Reef.

Remarks: According to Veron and Pichon (1982) *G. nigra* is the same as *G. stutchburyi* Wells.

Genus *Porites* Link, 1807

Type species: *Porites polymorphus* Link, 1807.

Generic characters: Colonial, encrusting, massive or ramose with small 1 to 2 mm, polygonal corallites and 12 septa. Synapticulae, pali and columella present.

The genus *Porites* has flourished in the past in Kutch waters than the present. The raised reefs of Okha was found to have large massive colonies more or less a metre in diameter, but such huge colonies were not seen in living condition at present in any of the localities investigated. Among the places the Pirotan

Island is having the maximum growth of this genus though was also exploited in large scale recently.

SYNOPSIS OF *PORITES*

1. Massive. Corallites 1—1.25 mm long. The ventral triplet of septa fuse each other at the tip to form a trident. Intercorallite wall zig-zag or straight. Pali six *P. lutea*
2. Encrusting or submassive. Corallites about 1 mm in diameter, often 2 to 6 running together without intercorallite wall. Pali poorly developed. *P. lichen*
3. Forming palmate, thick branches or with digitiform branches. Corallites polygonal, 1.5 to 2 mm in length. Septa steep at the wall. Pali poorly developed *P. compressa*

***Porites lutea* Milne Edwards and Haime, 1851 (Pl. V A)**

Porites lutea MEd.—H. Pillai, 1986, p. 158, pl. 9, figs. 1, 2 (Synonymy and description).

Localities: Okha, Paga, Boria, Pirotan Island.

Distribution: Widespread Indo-Pacific species from Red Sea to Samoa and Cook Islands in the Pacific.

***Porites lichen* Dana, 1846 (Pl. V B)**

Porites lichen, Dana. Pillai, 1986, p. 158 (synonymy).

Encrusting corallum and small calices often confluent. The second cycle of septa sometimes incomplete.

Remarks: Veron and Pichon (1982) have provided a long list of synonyms for this species including *Goniopora lichen* Klunzinger (*G. klunzingeri* Marenzeller, 1906). However, as already pointed out by Scheer and Pillai (1983)

G. lichen is a true *Gonipora* and is not a *Porites*.

Distribution : Red Sea eastward to Hawaii.

***Porites compressa* Dana, 1846 (Pl. V C-E)**

Porites compressa Dana. Scheer and Pillai, 1983, p. 101, pl. 25, fig. 56; Pillai, 1986, p. 160 (synonymy)

Ramose corallum with flabellate, digitiform or nodular branches. Corallites large and deep and resemble those of *Porites solida*. Ventral triplet of septa remain free. Five pali. Two rings of synapticulae visible. For further details reference may be made to Pillai (1986).

Locality : Pirotan Island. Larger colonies in 1978 measured upto 75 cm in greater spread and was observed to be very common.

Distribution : Red Sea eastward to Hawaii.

Suborder : FAVINA Vaughan and Wells, 1943

Family : FAVIIDAE Gregory, 1900

Genus *Favia* Oken, 1815

Type species : *Madrepora fragum* Esper, 1795.

Generic Characters : Encrusting to submassive. Corallites polygonal circular and plocoid. Coenosteum costate. Septa alternating in size with dentate edges. Columella present.

SYNOPSIS OF FAVIA

1. Encrusting, thick. Corallites and calices circular or oval, 10 to 20 mm in greater diameter. Total septa 25 to 40. Peritheca costate and highly blistery due to the presence of perithecal vesicles. *F. speciosa*
2. Submassive with circular or oval corallites and calices. Calices sometimes

distorted. Greater diameter of calyx 10 to 20 mm. Total septa 40 to 70. Intercorallite walls thick. Peritheca costate. *F. favus*

***Favia speciosa* (Dana), 1846 (Pl. VIII A)**

Favia speciosa (Dana). Pillai, 1986, p. 163, pl. 12, fig. 2 (synonymy and description).

Remarks : This species is rare in the Gulf of Kutch and only one specimen was obtained. *F. speciosa* and *F. favus* have the corallites more or less the same size. However they differ : (1) *F. speciosa* has a corallum which is very light and the peritheca and calicular cavities are provided with perithecal and endothecal vesicles, forming blisters. (2) *F. favus* has relatively large number of septa and the costae is very prominent. (3) Septa are slightly swollen at the wall in *favus* while in *F. speciosa* they are very thin.

Locality : Pirotan Island.

Distribution : Red Sea eastward to Tuamotu Archipelago.

***Favia favus* (Forskål), 1775 (Pl. VI A, B; VII C)**

Favia favus (Forskål) Pillai, 1986, p. 165, pl. 11, fig. 5 (synonymy and description).

The present specimens display wide skeletal variation. This is the most common species of *Favia* found in the Gulf of Kutch.

Distribution : Red Sea (Type locality); throughout the Indo-Pacific eastward to Fanning Island.

Genus *Favites* Link, 1807

Type species : *Madrepora abdita* Ellis and Solander, 1786.

Generic characters : Encrusting, submassive or massive. Corallites cerioid with fused walls. Corallites polygonal. Columella trabe-

ular. Septa alternating in size at the wall
Budding intra-tentacular.

SYNOPSIS OF *FAVITES*

1. Corallum encrusting, hillocky. Corallites polygonal, 10 to 20 mm long and upto 15 mm broad, one side elevated. Total septa range from 40 to 50. Septal teeth frosted giving a spiny look to the corallum. Exsert ends of septa unite at the top of the wall
..... *F. complanata*
2. Encrusting with hillocks. Corallites and calices polygonal. Intercorallite wall acute at the top. Calices 5 to 7 mm long 3 to 4 mm deep. Septa 28-36....
..... *F. melicerum*

***Favites complanata* (Ehrenberg), 1834**
(Pl. IV D ; VI C, D ; VII A)

Favites complanata (Ehrenberg) Pillai, 1986, p. 165
(synonymy).

Favites halicora (Ehrenberg) Pillai, 1986, p. 166
(synonymy).

For detailed description of this species reference may be made to Scheer and Pillai (1983) and Pillai (1986).

Remarks : *F. complanata* and *F. halicora* were regarded separate by all authors since Matthai (1914), though Scheer and Pillai (1983) and Pillai (1986) have pointed out that intermediate forms of both can be found and it is sometimes difficult to assign such specimens either to *F. complanata* or *F. halicora*. The species is very common in many localities in the Gulf of Kutch and a good suit of specimens was assembled. Based on critical examination of the present material *F. halicora* is merged with *F. complanata* in this work.

Localities : Okha, Dhani, Boria and Pirotan Island.

Distribution : Red Sea (Type locality) eastward to Tuamotu Archipelago.

***Favites melicerum* (Ehrenberg)**
1834 (Pl. III C)

Favites melicerum (Ehrenberg) Pillai, 1986, p. 167
(synonymy and description).

Veron *et al.* (1977) opted for the junior synonym *F. chinensis* Verrill to this species. However, the type of *Astrea melicerum* Ehrenberg is reported to be lost though, it was available to Matthai (1914) who has figured it and gave a good description, though under the name *F. pentagona* which subsequently Vaughan (1918) placed under *F. melicerum*. Since Ehrenberg's species can be identified with Matthai's (1914) text and figure, we do not think it is proper to opt for the specific name *chinensis* to this species. The specific status of *Favites chinensis* needs further assessment.

Locality : One specimen was obtained from Chandri Reef.

Distribution : ? Red Sea (Ehrenberg's type is not from Red Sea), Indo-Pacific as far east as Cook Islands.

Genus *Goniastrea* Milne Edwards
and Haime 1848

Type species : *Astrea retiformis* Lamarck, 1816.

Generic characters : Encrusting, sub-massive. Corallites, polygonal, cerioid or meandroid. Septa of equal thickness at the wall with conspicuous pali—form lobes. Colony formation by mono to tristomodaeal budding.

Only one species described as below is known from Gulf of Kutch.

***Goniastrea pectinata* (Ehrenberg) 1834**
(Pl. IV B)

Goniastrea pectinata (Ehrenberg) Pillai, 1986, p. 168
pl. 11, fig. 4, (synonymy and description).

Larger corallites in the present specimens are 10 to 11 mm in length, 8-9 mm broad and 4 to 6 mm deep. Total septa 24 to 30 with an equal number of smaller ones inbetween. Septa opposed or alternating at the top of the wall, slightly exsert. Pali prominent forming a circle around the columella.

Localities : Adathra, Okha, Boria, Dhoni, Paga, Pirotan Island.

Distribution : Red Sea (Type locality) eastward to Cook Islands.

Genus *Platygyra* Ehrenberg, 1834

Type species : *Madrepora (Platygyra) lamellina* Ehrenberg, 1834.

Generic characters : Massive, meandroid with long valleys. Collines thin, perforate. Width of valleys 5 to 7 mm. Septa slightly exsert. Columella trabecular.

A single species was collected.

Platygyra sinensis (Milne Edwards and Haime) 1849 (Pl. XII B)

Platygyra sinensis MED. H. Chevalier, 1975, p. 144 (synonymy); Scheer and Pillai, 1983, p. 125, p. 30, fig. 7 (synonymy).

Platygyra ryukyuensis Yabe Sugiyama and Eguchi 1936, p. 38, *Platygyra pini* Chevalier, 1975, p. 155.

Corallum massive, meandroid. Corallites monostomodaecal to short meandering valleys upto 2 cm long and 5 mm broad. Collines upto 2 mm thick. Septa of equal thickness at the top of colline, steeply descending. Collines solid or perforate. Columella trabecular, continuous.

Locality : One specimen from Adathra—Okha.

Distribution : Red Sea to Fiji and Hawaii. Widespread.

Remarks : A discussion on the synonymy of this species is given by Scheer and Pillai (1983). *Platygyra pini* Chevalier is said to differ from *P. sinensis* in having thicker collines by the development of sclerodermites. The present specimen collected from a site of high siltation has thick collines similar to *P. pini*. It seems *P. pini* is only a skeletal variant of the present species.

Genus *Hydnophora* Fischer de Waldheim, 1807

Type species : *Madrepora exesa* Pallas, 1766.

Generic characters : Explanate, massive or with hillocks. Surface rising to conical monticules bearing septa. Columella trabecular.

Hydnophora exesa (Pallas) 1766 (Pl. VIII B)

Hydnophora exesa (Pallas). Pillai, 1986, p. 171, pl. 13, fig. 2 (synonymy)

Explanate, upper surface with hillocks. Monticules 5 to 12 mm long and 4-5 mm high, conical or elongated. Septa vertically descending from the apex of the monticule; subequal or larger and smaller alternating with dentate edges. Columella trabecular.

Locality : Adathra Reef.

Distribution : Red Sea eastward in the Indo-Pacific as far Fiji and Samoa.

Genus *Plesiastrea* Milne Edwards and Haime, 1848

Type species : *Astrea versipora* Lamarck, 1816.

Generic characters : Plocoid. Massive or encrusting. Corallites and calices circular, 3 to 4 mm in diameter. Major septa with prominent pali. Coenosteum costate. Asexual reproduction by extra tentacular budding.

Plesiastrea versipora (Lamarck), 1816
(Pl. VIII C)

Favia versipora Matthai, 1914, p. 103, pl. 23, fig. 3, pl. 25, figs. 5, 6, 9, pl. 37, fig. 3 (synonymy)

Plesiastrea versipora Veron, Best and Pichon, 1977, p. 149 figs. 284-294 (synonymy); Scheer and Pillai, 1983, p. 139, pl. 33, figs. 2-5.

A submassive corallum is an overgrowth on a dead colony of *Montipora*. It has a greater spread of 17 cm. Corallites and calices circular, vary from 2.5 to 4 mm in diameter, 1 to 2 mm deep. Intercorallite area 1.5 to 2 mm thick, costate. Septa in three cycles, larger corallites with a few of the fourth cycle. Septa exsert, exsert ends arched, edges serrated. Major and minor septa alternating. At the lower two-thirds of the septum with a deep-cleft below which there is a prominent palus. Pali form a ring around the columella. Budding extra tentacular.

Locality : Paga.

Distribution : Red Sea; Western Indian Ocean, Maldives, Lakshadweep, Nicobar Islands, Cocos-Keeling Islands, Great Barrier Reef, Japan, Mariana Islands, Caroline Islands, Marshall Islands, New Caledonia, Fiji.

Genus *Leptastrea* Milne Edwards and Haime, 1848

Type species : *Leptastrea roissyana* Milne Edwards and Haime, 1848.

Generic characters : Encrusting, massive or with thick columnar branches. Corallites polygonal or circular and plocoid. Intercorallite grooves present. Coenosteum solid. Costae stop at the middle of the intercorallite groove. Columella papillary.

Though the genus is fairly common in all Indo-Pacific regions it was not found in most of the localities studied in Gulf of Kutch. A single specimen obtained is described as below,

Leptastrea purpurea (Dana), 1846

Leptastrea pupurea (Dana). Pillai, 1986, p. 172, pl. 11, fig. 3 (description and synonymy).

One specimen present in the collection is part of an upward nodular growth with a central worm tube. Corallites polygonal, calices polygonal or in some cases circular. Large corallites 9-12 mm long and 5-6 mm broad, about 1 mm deep. Intercorallite groove deep. Septa 40 to 60 depending on the size of the calyx. Other details as in Pillai (1986).

Locality : Sikka Point.

Distribution : Widespread from Red Sea to Tuamotu Archipelago.

Genus *Cyphastrea* Milne Edwards and Haime, 1848

Type species : *Astrea microphthalmia* Lamarck, 1816.

Generic characters : Encrusting or submassive, sometimes with digitiform branches. Corallites and calices circular, 1 to 3 mm in diameter level or projecting. Septa in three cycles. Surface coenosteum spiny.

Cyphastrea serailia (Forskål), 1775 (Pl. XB)

Cyphastrea serailia (Forskål) Pillai, 1986, p. 174, pl. 13, fig. 1 (synonymy and description)

Species is fairly common in the Gulf of Kutch. The following are the major skeletal variation present in different specimens.

1. Corallites level or projecting, touching each other to 1 mm apart.
2. Diameter of the calices varies from 1.75 to 2.5, primary and secondary septa and costae subequal or the former thicker.
3. Spines closely set or scattered. Exothecal vesicles may or may not be present.

Localities : Paga, Boria, Dona, Pirotan Island.

Distribution : Red Sea to Hawaii.

Family : *MUSSIDAE* Ortmann, 1890

Genus *Symphyllia* Milne Edwards and Haime, 1848

Type species : *Meandrina sinuosa* Quoy and Gaimard, 1833.

Generic characters : Massive, meandroid with sinuous long and broad valleys 10 to 25 mm wide. Collines ridged or grooved. Septa exsert, swollen at the wall, edges with sharp teeth (1 to 3 mm). Columella centres linked by lamellae.

Symphyllia radians Milne Edwards and Haime, 1848 (Pl. XI B, C)

Symphyllia radians MED.-H. Pillai, 1986, p. 180 (synonymy).

Corallum with a narrow base of attachment with free edges. Surface convex. Greater diameter 15 to 20 cm. Valleys radiating from centre of corallum, width 25-30 mm, depth 15 to 20 mm. Collines 2.5 to 3 mm thick. 12 to 15 septa per cm length of colline. Major septa with 6 to 8 teeth, larger upper teeth 1 to 3 mm long. Columella trabecular, formed by the fusion of septal ends, linked by lamellae. Collines ridged.

Locality : Adathra Reef.

Distribution : Maldives eastward to Rotuma in the Indo-Pacific.

Genus *Acanthastrea* Milne Edwards and Haime, 1848

Type species : *Acanthastrea spinosa* Milne Edwards and Haime, 1848.

Generic characters : Submassive, or encrusting. Corallites plocoid, polygonal or oval, mono to tristomodaal. Calices 10 to

25 mm broad. Septa with typical swollen mussid teeth.

Acanthastrea simplex Crossland, 1948
(Pl. VII B, XI A)

Acanthastrea simplex Crossland, 1948, p. 192, pl. 7.
Acanthastrea hillae Wells, 1955, p. 15, pl. 2, figs. 2, 3; Chevalier, 1975, p. 322, pl. 30, figs. 2, 4; Veron and Pichon, 1979, p. 257 figs. 440-447.

Greater diameter of largest specimen 9 cm. All coralla encrusting. Corallites polygonal or distorted, 30 to 35 mm long and 25 to 30 mm broad, 8-12 mm deep; monostomodaal, wall sometimes fused. Total number of septa range from 60 to 72 of which 15-18 reach columella. Septa exsert, slightly swollen at the wall, edges with 4 to 6 teeth, the upper tooth about 1 mm long and thick. An epitheca is often present at the growing edge of the corallum.

Locality : Adathra Reef-Okha. The mention of *Lobophyllia* by Patel (1978) is based on an erroneous determination of *Acanthastrea simplex*.

Distribution : Natal coast (Type locality), Gulf of Kutch; Australia, Chesterfield Island.

Remarks : While writing on the Red Sea corals Scheer and Pillai (1983) opined that *Acanthastrea hillae* Wells is the same as *A. simplex* and it is further confirmed by the examination of the present specimens. Though, Chevalier (1975) felt that *A. bowerbanki* Milne Edwards and Haime is the same as *A. hillae* Veron and Pichon (1979) treated them separately. According to Matthai (1914) *A. bowerbanki* is close to *Favites flexuosa* (= *Favia favosa* Matthai).

Family : *PECTINIDAE* Vaughan and Wells, 1943

Genus *Mycedium* Oken, 1815

Type species : *Madrepora elephantotus* Pallas, 1766.

Generic characters : Colonial, foliaceous, with nariform large corallites 8 to 12 mm in diameter. Coenosteum costate.

Mycedium elephantotus (Pallas), 1766

Mycedium elephantotus (Pallas). Pillai, 1986, p. 181, pl. 11, fig. 1 (synonymy and description).

One specimen from Boria was earlier reported by Patel (1976) as *Podabacia crustacea*.

Distribution : Red Sea eastward to Fiji and Tahiti.

Suborder : CARYOPHYLLIINA Vaughan and Wells, 1943

Superfamily : CARYOPHYLLICAE, Gray 1847

Family : CARYOPHYLLIDAE Gray, 1847

Subfamily CARYOPHYLLINAE Gray, 1847

Genus *Paracyathus* Milne Edwards and Haime, 1848

Type species : *Paracyathus procumbens* Milne Edwards and Haime, 1848.

Generic characters : Solitary, turbinate fixed. Septa exsert, arched with dentate edges. Pali in more than one circle around a papilliform columella.

Paracyathus stokesi Milne Edwards and Haime, 1848 (Pl. XII C)

Paracyathus stokesi MED. H. Horst, 1931, p. 7, pl. 1, figs. 1-6, pl. 2, fig. (synonymy).

Solitary, turbinate, fixed with a narrow base. Calyx 17×13 mm in diameters, 6 mm deep. Septa in five cycles, all septa exsert and arched. Upper part of septa with entire edges, lower half with 6-8 teeth. Three cycles of septa reach the columella. 4th and 5th cycle of septa unite to lower cycles. Pali prominent, merging with papillae of columella. Septal sides granular. Inner side of calyx and septa chocolate-brown.

Locality : Okha.

Distribution : Mangalore ; Okha ; Sri Lanka and Puri Beach, Mergui-Archipelago.

Genus *Polycyathus* Duncan, 1876

Type species : *Polycyathus atlanticus* Duncan, 1876.

Generic characters : Calices similar to *Polycyathus*, but the daughter corallites formed by extratentacular budding remaining attached forming clusters.

Polycyathus verrilli Duncan, 1889

Polycyathus verrilli Duncan, Pillai, 1986, p.184 (synonymy and description).

Species was found under boulders and other corals in almost all localities investigated. Individual corallites are 2 to 2.5 mm in diameter and 2 to 3 mm high. Further details as in Pillai (1986).

Localities : Okha, Paga, Boria and Pirotan Islands.

Distribution : Maldives ; Gulf of Kutch Gulf of Mannar ; Mergui Archipelago ; Marshall Islands ; Loyalty Islands.

Suborder : DENDROPHYLLIINA Vaughan and Wells, 1943

Family : DENDROPHYLLIDAE Gray, 1847

Genus *Dendrophyllia* de Blainville, 1830

Type species : *Madrepora ramea* Linnaeus, 1758.

Generic characters : Colonial, ramose, dendroid or subarborescent. Corallites projecting, wall porous costate. Septa undergoing fusion according to Portales plan. Columella spongy.

***Dendrophyllia minuscula* Bourne, 1905
(Pl. IX C)**

Dendrophyllia minuscula Bourne, Scheer and Pillai, 1983, p. 170, pl. 39, figs. 5-10 (synonymy).

Two tufted coralla are placed under this species. The main branch in the larger corallum is 1.75 cm thick and is subdividing. Corallites 3.5 to 5 mm in diameter, 4-6 mm in height. Calices 3-4 mm in diameter 1 to 2 mm deep. Septa in four complete cycles. Columella projecting at the bottom of the calyx. (For further details reference may be made to Sudarsan and Mukhopadhyaya, 1969.)

Locality : Okha (10 m).

Distribution : Red Sea ; Gulf of Kutch ; Sri Lanka (Type locality) ; Andaman Islands ; Kei Island.

Genus *Tubastraea* Lesson, 1834

Type species : *Tubastraea coccinea* Lesson, 1834.

Generic characters : Subplocoid to dendroid. Corallites formed by budding united by a feeble coenosteum that is costate. Living coral generally red or orange.

***Tubastraea aurea* (Quoy and Gaimard), 1833**

Tubastraea aurea (Q and G) Pillai, 1986, p. 191, pl. 13, fig. 7 (synonymy and description).

Larger corallites are 8 to 10 mm in diameter and 4-6 mm in height. Septa in three cycles. Further details as in Pillai (1986).

Locality : Dona, Boria.

Distribution : Red Sea eastward to Society Islands and Hawaii.

Genus *Turbinaria* Oken, 1815

Type species : *Madrepora crater* Pallas, 1766.

Generic characters : Colonial, explanate, crateriform or foliaceous, Coenosteum porous, surface with ridges and furrows. Columella well developed. Corallites circular, level or projecting.

SYNOPSIS OF *TURBINARIA*

1. Corallum cupshaped to crateriform and foliaceous. Corallites average 2 mm in diameter, often arranged in concentric rows. Septa range from 12 to 24. Columella deep-seated
..... *T. crater*
2. Corallum shield-like or overgrowing dead substratum. Corallites 7 to 7 mm in diameter, level or projecting. Septa 24. Columella 1 to 2 mm in diameter at the bottom of the calyx.....
..... *T. peltata*

***Turbinaria crater* (Pallas) 1766
(Pl. X A, XII D, XIII B)**

Turbinaria crater (Pallas), Pillai, 1986, p. 192, pl. 13, fig. 5, (synonymy).

Turbinaria undata Bernard Pillai, 1986, p. 193 (synonymy).

Turbinaria speciosa Bernard, 1896, p. 32, pl. 5, pl. 31, fig. 6.

Turbinaria pustulosa Bernard, 1896, p. 35.

Turbinaria reniformis Bernard, 1896, p. 61.

Common in Boria Bank. A good suit of specimen was assembled based on which the above list of synonyms for the species is drawn up. For a detailed description reference may be made to Pillai (1986).

Locality : Boria Pirotan Island.

Distribution : West coast of India to Marshall Islands. Not known from Red Sea.

Turbinaria peltata (Esper) 1797
(Pl. XII A, XIII A)

Turbinaria peltata (Esper) Pillai, 1986, p. 194, pl. 3, fig. 5 (synonymy and description).

Turbinaria globularis Bernard 1896, p. 68, pl. 20, pl. 32, fig. 20.

The initial growthform of this species is with a narrow base of attachment that get expanded at the top. In the Gulf of Kutch many specimens were found lying free as over-

growth of dead coralline material exactly resembling *T. globularis* Bernard. These have projecting corallites upto 4 mm in height. Calices 4 to 5 mm in diameter. Details as given by Pillai (1986).

Localities : Okha, Paga, Boria, Pirotan Island. Fairly common.

Distribution : Central Indian Ocean to Fiji in the Pacific.

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