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Report on the Stony Corals from the Maldive Archipelago

Results of the Xarifa Expedition 1957/58 of the International Institute for Submarine Research, Vaduz, Liechtenstein (Director Dr. Hans Hass)

With 9 Figures in the Text and 32 Plates

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Contents

A. INTRODUCTION

I. The Maldive Islands

The Maldive Archipelago, situated at the southwest of India, consists of 22 atolls, extending over a length of nearly 470 km in a north-south direction. The northern limit is Ihavandiffulu Atoll (7°05'N, 72°55'E), while Addu, one of the scientifically well known atolls, is located at the southern tip (0°40'S, 73°10'E). The largest among the Maldivian atolls is located in the northern half of the chain and is known by two names, a northern smaller part called Tiladummati, and the southern part Miladummadulu.

At the middle part of the Archipelago the atolls are arranged in two almost parallel rows, incorporating a great number of Faros with their small lagoon-like water bodies, termed Velu. The type locality of Atolls and Faros are the Maldives, the names originating from the Maldivian language.

Nearly 2000 small islands enter into the geography of the Maldives, of which circa 200 are inhabited with a population of nearly 120 000.

1. History of coral and coral reef studies in the Maldives

The scientific studies of the Maldives began with Commander R. MORESBY, who surveyed the atolls during 1834 to 1836. However, he published only a short account of the northern atolls (1835). Charles DARWIN (1842) had the benefit of MORESBY's notes and personal discussions while writing on the coral reef problems. DARWIN believed (1842 : 110) that the double chain of Maldivian atolls could originate by the subsidence of an island like New Caledonia, followed by the upgrowth of the surrounding fringing reefs; a view later supported by DAVIES (1928 : 527–532), whereas DALY (1915 : 242) supposed the existence of wave-cut platforms as basis for the atolls, produced by the abrasion of preexisting islands as a result of the lower sea-level in the glacial period.

A major scientific investigation of the Maldives started with J. Stanley GARDINER of the University of Cambridge. GARDINER spent serveral weeks in the Maldives during October 1899 to April 1900 with a team of scientists. The results of his investigations are consolidated in two large volumes (GARDINER, (ed.), 1903–1906) containing elaborate discussions on the reef formations of the Maldives and Laccadives and systematic analysis of zoological and botanical specimens collected. This classic work remained for a long time the only source of our information on the fauna and flora of the Maldives. GARDINER maintained his interest in the reefs and reef-building animals of the Maldives resulting in a number of communications (GARDINER, 1902, 1903, 1903 b, 1906, 1930, 1931, and 1904, 1905, 1909, 1929). However, many major genera like *Acropora, Montipora* and *Porites* among the corals remained unmonographed.

Prior to GARDINER's visit to the Maldives the German Deep-Sea Expedition with the „Valdivia" visited Suvadiva Atoll (CHUN, 1900 : 393–403). Two years after GARDINER Alexander AGASSIZ visited the Maldives. He published a large volume (1903) with descriptions and photos of the islands. This was followed by a visit of the German research vessel "Planet" (LÜBBERT, 1909).

Then there was a lapse of any major interest for nearly 25 years in the Maldivian reefs and associated animal communities, till DERANIYAGALA made a collection of specimens in 1932 for the Colombo Museum (DERANIYAGALA, 1956). This was followed by the John MURRAY Expedition under the leadership of Lt. Colonel R. B. SEYMOUR SEWELL, resulting in a number of publications on corals and coral reefs (SEWELL, 1936, 1936 a; GARDINER & WAUGH, 1938, 1939), including deep soundings (FARQUHARSON, 1936) and gravity surveys (GLENNIE, 1936).

After World War II Major W. W. A. PHILLIPS conducted zoological, especially ornithological observations in the Maldives (PHILLIPS, 1958, 1958 a, 1958 b, 1958 c, 1960, 1963, 1964; PHILLIPS & SIMS, 1958, 1958 a; HILL, 1958; PALMER,

1958). In 1956, F. R. FOSBERG of the Smithsonian Institution, Washington, D. C., paid a visit to Male Atoll and elaborated the flora of WILLIS & GARDINER (1901) and brought it up to date (FOSBERG, 1957). In 1957 the Yale Seychelles Expedition also called at the Maldives (KOHN, 1964, 1964 a, 1968; KOHN & ROBERTSON, 1968). The German „Xarifa" Expedition under the leadership of Dr. Hans HASS reached the Maldives in December 1957 and made scientific investigations on the various atolls of the Maldives over a period of four months (HASS, 1961, 1965; EIBL-EIBESFELDT, 1964, 1966). The schedule and summary of the research work done during the „Xarifa" Expedition is given in detail below.

A subsequent major attempt to study the reefs of the Maldives was made by a British team under the leadership of Dr. D. R. STODDART of the University of Cambridge in 1964. The team studied the geomorphology of the reefs of Addu Atoll and the zonation of corals (STODDART, DAVIES & KEITH, 1966; DAVIES, STODDART & SIGEE, 1971; CLARK & DAVIES, 1966; STODDART, 1972), the coral fauna (WELLS & DAVIES, 1966), algae and land vegetation (GROVES, 1966; SIGEE, 1966; FOSBERG, GROVES & SIGEE, 1966; TSUDA & NEWHOUSE, 1966). A report with the preliminary results as well as with detailed climatological data, which also includes a hitherto unpublished manuscript of Commander MORESBY about "Addu Atoll in 1836", was published by STODDART in 1966.

2. The "Xarifa" Expedition

The "Xarifa", a three-masted schooner, was under the command of Captain Hein BECKER and under the scientific leadership of Dr. Hans HASS, International Institute for Submarine Research, Vaduz, Liechtenstein. Before the ship arrived at Addu Atoll in the last week of December 1957, research work was done in the Red Sea and at Abd-el-Kuri, an island between Sokotra and Cape Guardafui at the east tip of Africa. After the Maldives and the stay of three months in Ceylon the "Xarifa" visited the Nicobars and several islands in the Strait of Malacca and ended her voyage in Singapore.

The origin, operation and observations of this expedition are reported in detail by Dr. HASS in his profusely illustrated and well written book "Expedition ins Unbekannte" (1961, English translation 1965).

a) Itinerary of the "Xarifa" in the Maldives (see Fig. 1).

Table 1.

Atoll	Arrival	Anchorage	Departure
Addu	21.12.1957	off Gan; 0°40,5'S, 73°9,5'E	
	27.12.	off Hittadu; 0°37,5'S, 73°7,5'E	
	3. 2.1958	off Gan	8. 2.1958
Suvadiva	9. 2.	off Gan; 0°16'N, 73°21,5'E	
	10. 2.	off Wadu; 0°15'N, 73°14,5'E	11. 2.
Ari	13. 2.	off Fusdu; 4°1,5'N, 72°48'E	
	21. 2.	off Malos; 4°0,5'N, 72°42,5'E	22. 2.
Rasdu	22. 2.	off Weligandu; 4°18'N, 72°59,5'E	27. 2.
North Male	27. 2.	off Male; 4°11'N, 73°30'E	4. 3.
Ari	4. 3.	NE coast; 4°10'N, 72°54'E	6. 3.
Rasdu	6. 3.	off Weligandu	21. 3.
North Male	21. 3.	off Male	24. 3.
Gaha Faro	24. 3.	lagoon; 4°44,5'N, 73°27,5'E	31. 3.
Fadiffolu	31. 3.	off Difuri; 5°25'N, 73°37,5'E	
	2. 4.	off Madewaru; 5°27,5'N, 73°22,5'E	13. 4.
Miladummadulu	13. 4.	off Kuludu; 5°57,5'N, 73°23'E	
	18. 4.	off Bodu Mandu; 5°59,5'N, 73°17'E	
	20. 4.	off Kuludu; 5°56,5'N, 73°24'E	21. 4.1958

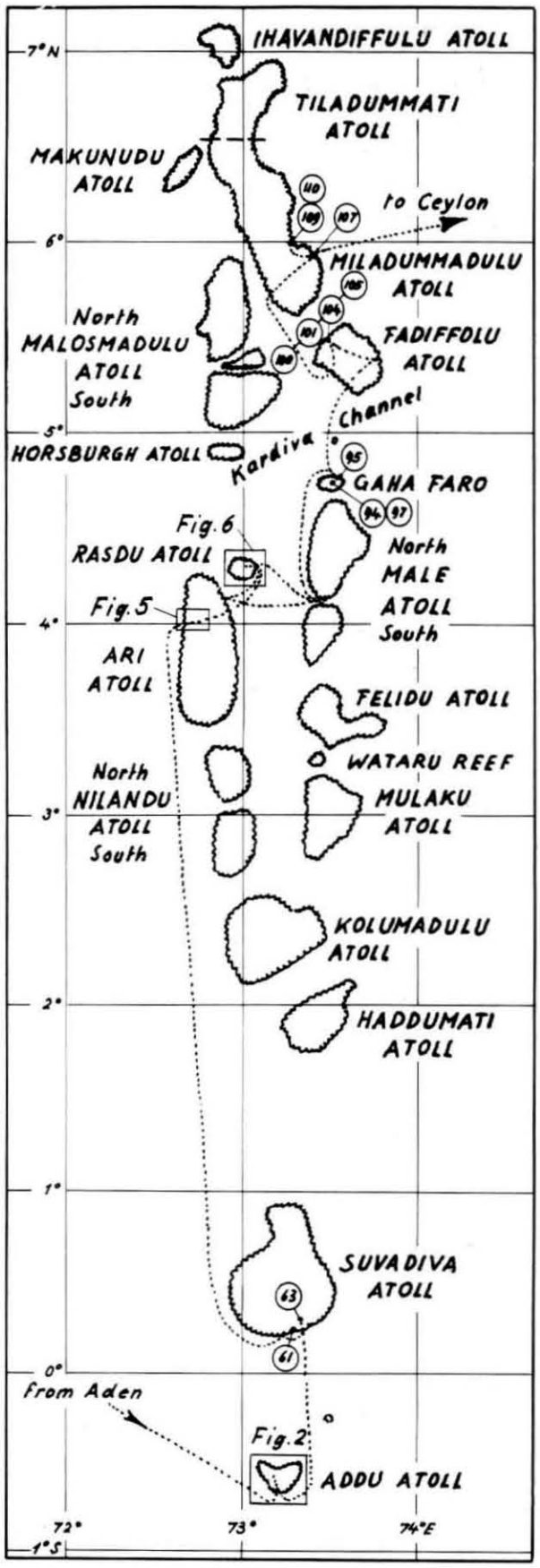

Fig. 1. The Maldive Atolls with the route of the "Xarifa". (After Seekarte des Deutschen Hydrographischen Instituts Hamburg Nr. 351: Malediven bis Ceylon.)

b) Major research work done during the "Xarifa" Expedition in the Maldives. Dr. HASS, the scientific leader of the expedition, concentrated his efforts, besides of his extensive film work, on the problems relating to the origin and formation of the atoll reefs and islands, formulating himself a new hypothesis on atoll formation (HASS, 1961, 1962, 1962 a, 1965). Dr. Irenäus EIBL-EIBESFELDT, then member of the Max Planck Institut für Verhaltensphysiologie, Seewiesen, studied the behaviour of reef fishes (1959, 1960, 1962; EIBL-EIBESFELDT & HASS, 1959; EIBL-EIBESFELDT & WICKLER, 1966), reported on his discovery of "Garden eels" (KLAUSEWITZ & EIBL-EIBESFELDT, 1959) and wrote a book about the expedition (1964, 1966). The metabolism and lime production of reef corals was the subject of study by Dr. Ludwig FRANZISKET of the Westfälisches Landesmuseum für Naturkunde Münster, (1964), who also wrote about fish observations (1959, 1965). Dr. Sebastian GERLACH, then Zoologisches Institut der Universität Kiel, published a series of articles on the corals and lagoon sand associated animal communities (1958, 1961, 1962, 1963, 1963 a, 1963 b, 1963 c, 1963 d, 1964, 1964 a) and elaborated a synopsis of the coral reef as biotope (1959, 1961 a). A systematic account of the fishes collected was given by Dr. Wolfgang KLAUSEWITZ, Forschungsinstitut Senckenberg, Frankfurt a. M., in a number of publications (1960, 1962 a, 1962 b, 1962 c, 1963, 1964, 1969, 1969 a, 1970, 1970 a, 1972, 1972 a, 1973, 1974, 1974 a; KLAUSEWITZ & EIBL-EIBESFELDT, 1959; RANDALL & KLAUSEWITZ, 1973). He also studied coloration and motion of fishes (1958 a, 1961, 1962) and wrote a short account on the atoll reefs (1958). SCHEER, one of the authors of the present report, collected corals and studied the ecology and zonation of reef-building corals in some of the atolls (1959, 1959 a, 1960, 1960 b, 1971, 1972). He applied the methods of phytosociology to the investigation of reefs (1967 a, 1972, 1974) and measured the twilight brightness in the area (1961, 1961 a). Furthermore, he wrote some popularized reports (1958, 1958 a, 1958 b) and studied the avifauna together with FRANZISKET (SCHEER, 1960 a). Their results were later incorporated by PHILLIPS (1963) in his account of the avifauna of the Maldives.

Some of the material brought home was later sent to specialists, and to date BATH (1960) reported on the skin of a "Garden eel"; CLARK (1960) on new pycnogonids; GUINOT (1962) on brachyurs; HUMES (1960) on new copepods; MARCUS & MARCUS (1960) on Opistobranchia and FRÖILAND (1976) on hawkfishes.

In the present report a detailed systematic account of the corals collected during the "Xarifa" Expedition is presented. Most of the genera mentioned here and many of the species are already reported by SCHEER (1971, 1974). The entire material is housed in the Zoological Department of the Hessian State Museum, Darmstadt, West Germany.

3. Acknowledgments

PILLAI is grateful to the Alexander von Humboldt Foundation, Bonn-Bad Godesberg, for a fellowship to work in Germany, and he is grateful to the Director, Central Marine Fisheries Research Institute, Cochin, for grant of necessary leave of absence which enabled him to associate with SCHEER.

SCHEER is greatly obliged to Dr. Hans HASS, the leader of the 2nd "Xarifa" Expedition, for the opportunity to participate in the expedition.

We gratefully acknowledge the contribution made by the Alexander von Humboldt Foundation towards the cost of printing this paper. We thank W. KUMPF, Hessian State Museum Darmstadt, for the photographs of the corals published here, and we thank Mrs. Helga RAU for valuable secretarial assistance.

II. The Collecting Stations

All corals reported in this work were collected with the aid of mask and finns in shallow waters or with SCUBA in deeper waters. They were cut off with hammer and chisel and transported in a canvas sack to an accompanying boat. The atolls are treated in the sequence of visiting them (see Fig. 1).

1. Addu Atoll (Figs. 2 and 3)

a) Inner reefs

Station 16: this refers to several sites on the north-western inner reef of the Atoll. No specific area is demarkated as in the case of the other stations.

α) Inner reef at Hitaddu

Station 17: near the reef edge to the lagoon, depth 1.5 m.

Station 18: between island and reef edge, near the beginning of coral growth, depth 4 m.

Station 19: near station 18 on a sandy patch, depth 3 m.

β) Inner reef between Abuhera and Hankada

Station 20: reef slope near reef edge, depth 3–5 m.

γ) Inner reef at Gan

Description and profile are given in SCHEER 1972 (p. 88 and fig. 2a).

Station 57: reef slope, depth about 20 m.

b) Lagoon bottom

α) Wreck

Tanker off Abuhera, sunken in 1942, lies on starboard side. Bottom of the tanker forms an angle of 78° with the lagoon floor.

Station 31: port-side and bottom of the tanker, depth 20–25 m.

Station 32: dark place between starboard and lagoon floor, depth 30 m.

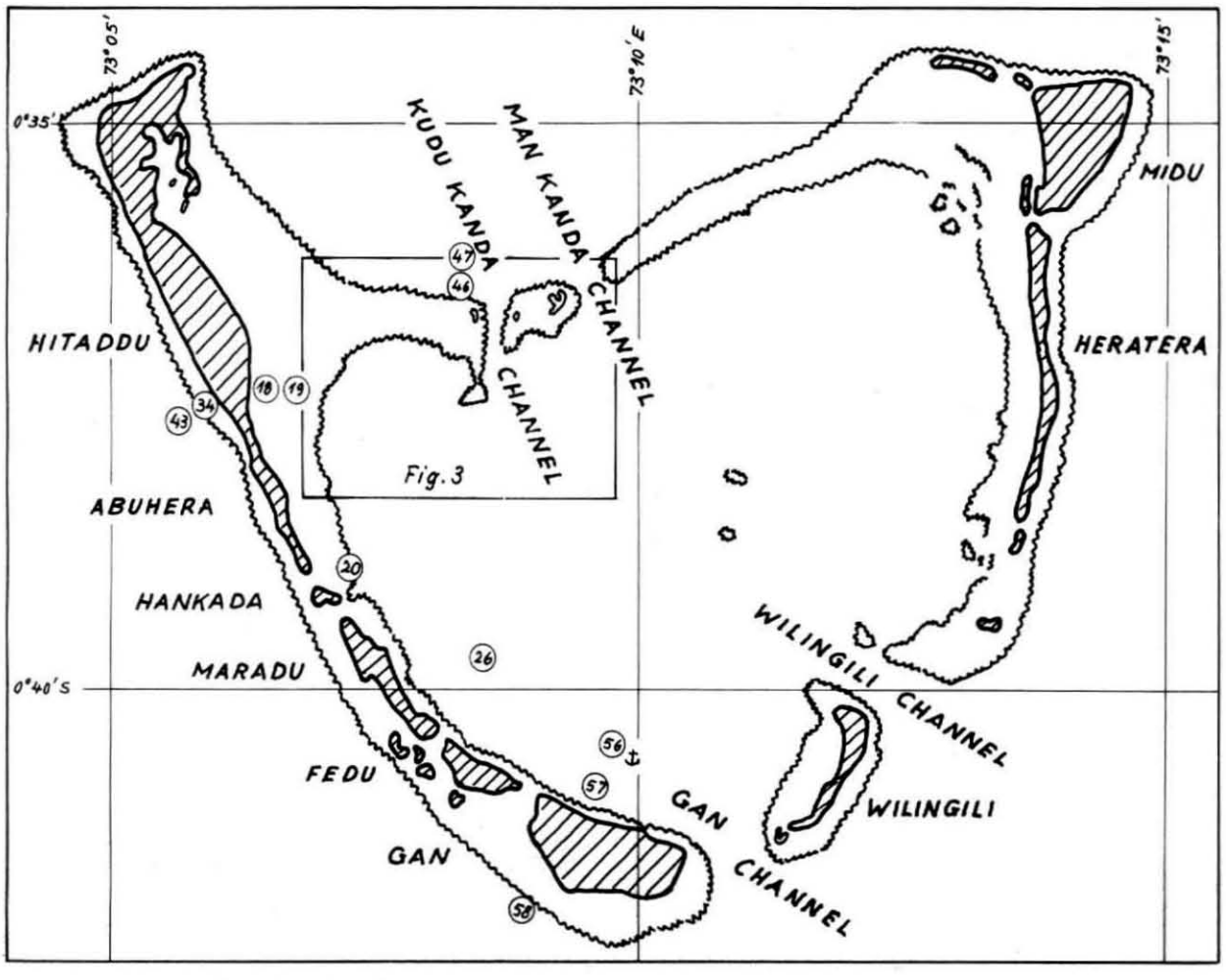

Fig. 2. Addu Atoll. (After Admiralty Chart 2067: Maldive Islands, Addu Atoll.)

β) Anchoring place off Gan
Station 56: depth 40 m.

c) Outer reefs
α) Outer reef a Hitaddu
For description and profile see SCHEER 1972 (p. 90/91 and fig. 2b).
Station 34: reef flat near the island, depth about 1 m.
Station 43: zone below the groove-and-spur system, depth 10–15 m.
β) Outer reef at Gan
Station 58: base of groove-and-spur system, depth 10 m and 15 m (*Pocillopora*). Current of medium intensity along the coast, at the surface slight surf.
γ) Northern outer reef
Description and profile of this reef as in SCHEER 1972 (p. 91 and fig. 2c).
Station 46: reef slope, descending on an angle of 56°, depth 40 m.
Station 47: reef slope, depth 60 m.

d) Northern reef flat
α) East of Kudu Kanda Channel
Station 48: between Bird Islet and Bushy Islet, depth 2–3 m.
Station 49: between Bird Islet and Channel, depth about 4 m. Weak current to S during flood-tide, during ebb-tide reverse.
β) West of Kudu Kanda Channel
Station 50: coral patch on sandy bottom near Rubble Island, depth 6 m. Weak current to S, like st. 49.
Station 51: coral patch west of Rubble Island, depth 6–8 m.

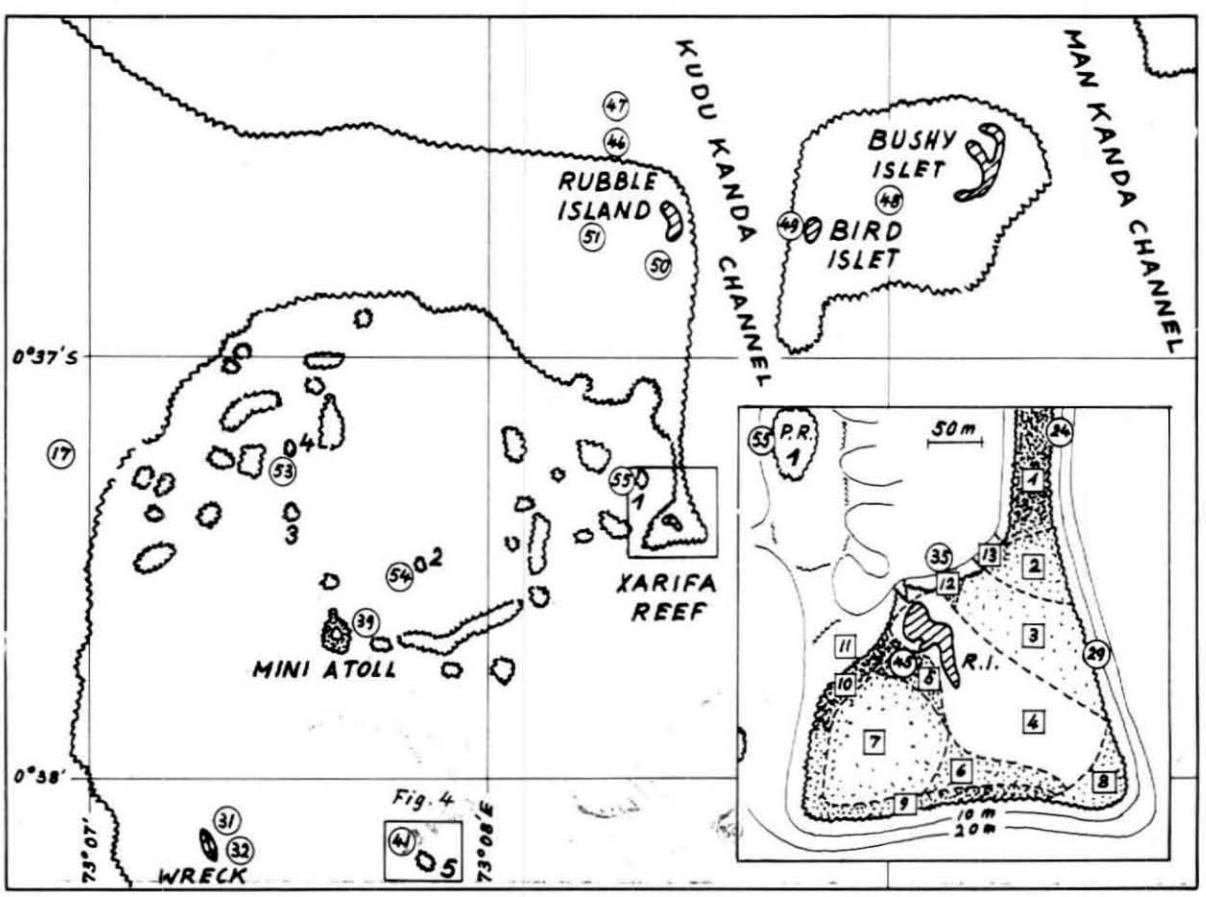

Fig. 3. Part of Addu Atoll and "Xarifa" Reef.

e) Patch reefs in the northwest part of the atoll

α) Beacon on a patch reef east of Maradu

Station 26: upper side of the patch reef, depth 2 m.

β) Mini-Atoll

For description and division into zones see SCHEER 1972 (p. 99 and fig. 7).

Station 39: slope on east side, depth 10–20 m.

γ) Patch reef 1

Northwest of Rubble Islet (R. I.) on Xarifa Reef.

Station 55: west slope, depth 5–8 m.

δ) Patch reef 2

West of Xarifa Reef. Description, zones and profiles as in SCHEER 1971 (p. 343 and fig. 8).

Station 54: different parts of the patch, in detail:
west slope, depth 28 m (*Euphyllia*),
terrace at south slope, depth 18 m (*Lobophyllia* and *Cycloseris*).

ε) Patch reef 4

North of Mini-Atoll.

Station 53: western edge of the patch surface, depth 4 m.

ζ) Patch reef 5 (Fig. 4)

South of Mini-Atoll. This patch reef, extending on a northwest/southeast direction, is represented in fig. 4 which serves to illustrate a typical reef of this kind. Data based on a survey of the reef by Dr. Hans HASS.

Zone 1: Bare oval of about 45 to 40 m at a depth of 6 m. Only very few corals. Two big *Porites* masses (P) were evident.

Zone 2: Talus without corals as continuation of zone 1 to about 27 m depth.

Zone 3: Ridge, about 15 m long, densely overgrown with corals, especially *Acropora* species, and reaching to 3.5 m from the surface. (Ac is a huge *Acropora* table).

Zone 4: Slope with many corals.

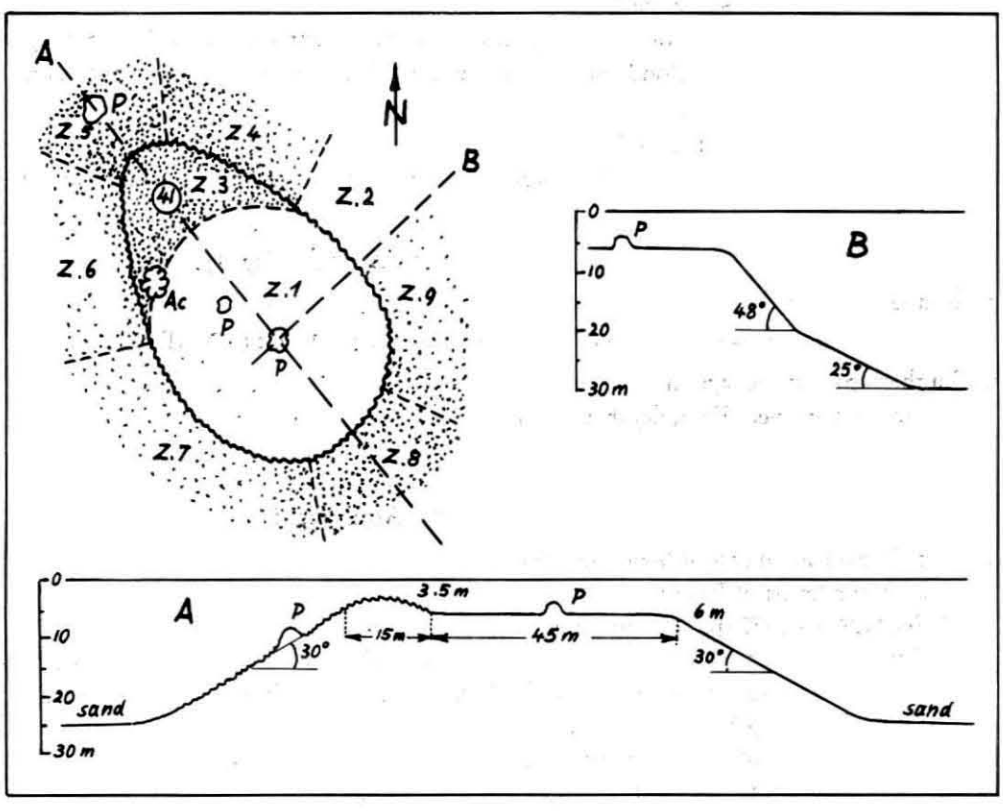

Fig. 4. Patch Reef 5 in Addu Atoll.

Zone 5: Slope with a gradient of about 30° and densely overgrown with corals. Conspicuous are *Acropora* tables. (P = *Porites*).
Zone 6: Slope with alcyonarians and only sporadic scleractinians.
Zone 7: No sharp boundary to zone 6. *Acropora* and other corals increasing, alcyonarians diminishing.
Zone 8: Gently inclined slope with *Echinopora*.
Zone 9: Steeper slope with prevailing *Acropora* hedges and tables.
Station 41: northwest part of the surface (zone 3), depth 3–4 m.

f) Xarifa Reef (Fig. 3)
This reef is divided into several zones as shown in the inserted map of Fig. 3. A more detailed description is given in SCHEER 1971 (p. 338 and fig. 6) and SCHEER 1972 (p. 91 and figs. 4–6).
Station 24: eastern slope of the ridge north of Xarifa Reef, below zone 1, depth about 8 m. Current of medium strength to S, like st. 49.
Station 29: eastern reef slope below zone 3, depth 4–5 m. Current weaker than at st. 24.
Station 35: northern reef slope, zone 12, depth 10–12 m.
Station 45: reef flat, zone 5, depth about 2 m.
Station Sch: from different parts of the reef, in detail:
1–20: zones 12 and 13, reef slope, depth 4–10 m.
21–27: zone 5, station 45.
28–32: zone 12, station 35.
33–35: zone 6, reef flat, depth 2–3 m.
36–39: zone 9, southern reef edge, depth 2 m.
40–41: zone 5.
42–43: zone 7, deepened part of reef flat, depth 3–4 m.
44–45: zone 10, northwestern reef edge, depth about 2 m.
46, 48: zone 7.
47: zone 5.
49: zone 9.
50: zone 3, reef flat, mostly coral debris, depth 1–2 m. Strong current and swell during flood-tide to SW, during ebb-tide nearly no current. In zone 4 breakers, therefore no corals.
51: zone 7.
52: zone 2, northern part of the reef flat, depth 1–2 m. Current of medium intensity to SSW.

2. Suvadiva Atoll (see Fig. 1)

a) Southern reef flat
Station 61: wreck south of Gan, depth 4–5 m. Slight current to NNE.

b) Southern part of the lagoon
Station 63: near Fulu, depth about 4 m.

3. Ari Atoll (Fig. 5)

a) Reefs in the lagoon east of Malos and Feridu
α) Faro northwest of Fusdu
See SCHEER 1972 (p. 102 and fig. 9).
Station 65: east slope with dead corals and coral debris descending with a gradient of 40° to 25 m, then with 30° to 30 m, from there with 20° to 34 m, and finally with 10° to 40 m, in detail:
depth 2 m (*Porites*),
depth 25–30 m (*Hydnophora*),
depth 36–40 m (*Stylophora*).

Station 66: southeast slope, depth 1.5 m. Strong current to W.
Station 67: southern reef flat, depth 0.5–1.5 m. Slight current to W.
Station 68: surface of the ridge across the lagoon, depth 0.5–1.7 m.
Station 69: western part of the faro, in detail:
western flat, descending to 4 m with 5°, then to 8 m with 10°, depth 6 m (*Gardineroseris*),
west slope, descending from 8 m to 26 m with 40°, depth 20 m (*Porites, Pocillopora*), depth 21 m (*Turbinaria*).

β) Mini-atoll northeast of Xarifa Islet
See SCHEER 1971 (p. 348 and fig. 10).
Station 71: southern reef flat, depth 1.5 m.

γ) Patch reef northeast of Xarifa Islet
Station 72: east slope, depth 10–12 m.

δ) Great Faro east of Xarifa Islet
See SCHEER 1971 (p. 346 and fig. 9).
Station 73: southern reef flat, depth 1.5 m.
Station 75: reef flat, in the east-northeast of the faro, depth 2 m.
Station 76: grottos in the vertical wall of the south side, depth 15 m and 18 m (see fig. 10 in SCHEER, 1972).

ε) Fusdu
Station 74: northeast slope of the fringing reef, in a grotto, depth 12 m.

b) Reef around Malos at the eastern rim of Ari Atoll
Station 199: edge of inner reef, northeast of Malos, depth 4 m. Slight current to W.
Station 200: reef flat of outer reef, west of Malos, depth about 2 m. Current somewhat stronger than at st. 199.

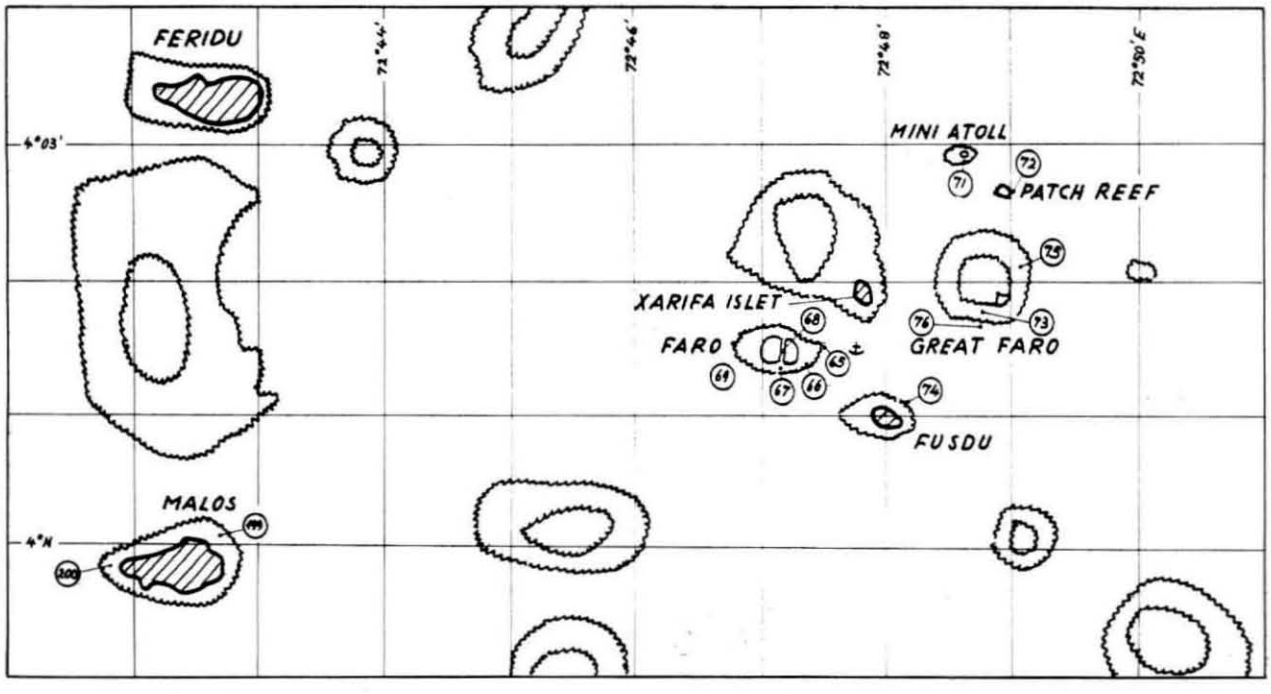

Fig. 5. Part of Ari Atoll. (After Admiralty Chart 66 B: Maldive Islands, sheet No. 2.)

4. Rasdu Atoll (Fig. 6)

The reefs around Weligandu were described in detail by SCHEER (1972 and 1974) with special reference to sociology of corals.

a) Inner reef at Weligandu
- Station 81: reef flat, depth 1–2 m.
- Station 82: reef flat, depth 1–2 m.
- Station 83: reef flat, depth 2–4 m.
- Station 84: reef flat, depth 1–2 m.
- Station 85: reef flat, depth 1–2 m.
- Station 86: reef slope, depth 25 m.

b) Outer reef at Weligandu
- Station 87: inner side of a projecting tongue south of Weligandu, depth 15 m.
- Station 89: outer side of the projecting tongue, depth 25 m. Slight current to S.
- Station 90: reef flat east of northern tip of Weligandu, depth 1–2 m. Slight current to S, slight surf.
- Station 92: reef surface of the projecting tongue, depth 1–3 m.

c) Lagoon bottom

α) Anchoring place off Weligandu
- Station 88: sandy floor with coral patches, depth 35 m.
- Station 91: long-stretched elevation, 5 m high, near station 88, consisting almost entirely of *Halomitra*, depth 35 m.

β) Channel north of Weligandu
- Station 93: sandy floor with scattered coral patches, depth 12 m. Slight current to W.

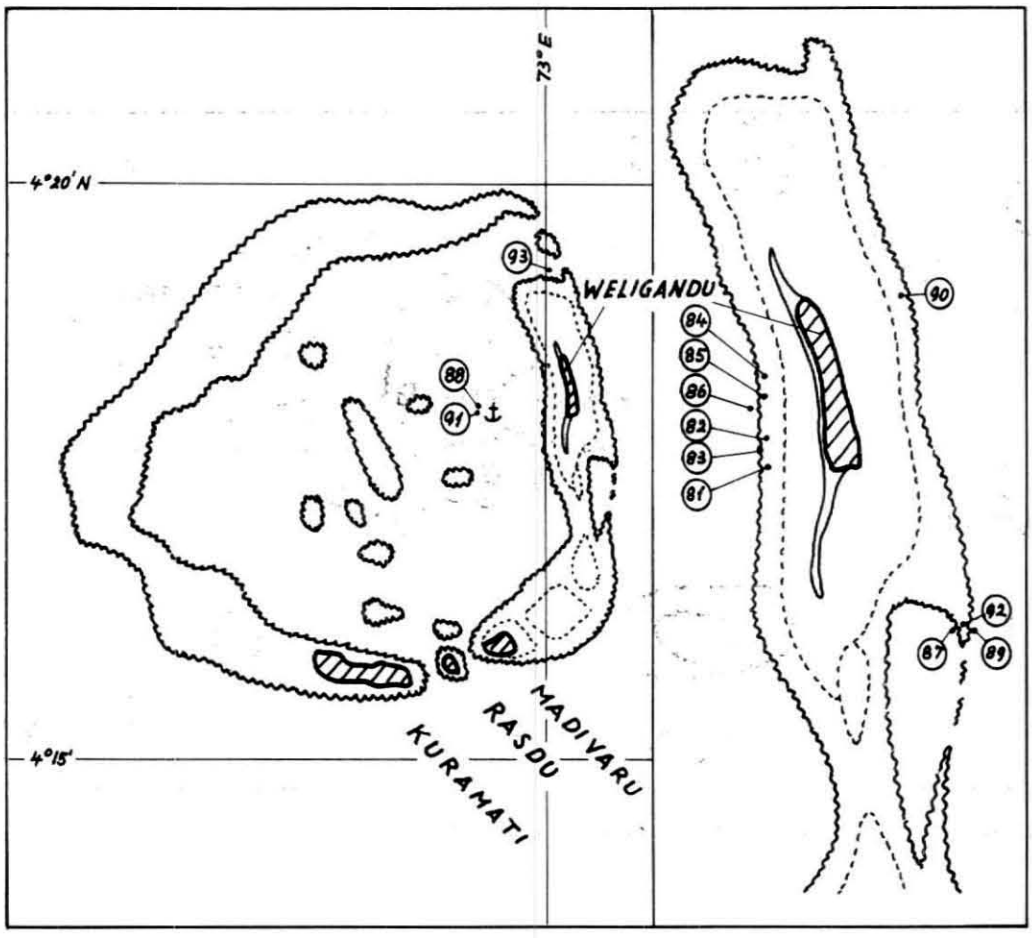

Fig. 6. Rasdu Atoll. (After Admiralty Chart 66 B: Maldive Islands, sheet No. 2.)

5. Gaha Faro (see Fig. 1)

a) Patch reef in the eastern part of the lagoon
For description, zones and profiles see SCHEER 1971 (p.352 and fig. 11).
Station 94: south slope, depth 3 m.
Station 97: different points, depth 2–4 m.

b) Outer reef, east side of the atoll
Station 95: wreck, lying in a depth of 6–30 m, depth 6 m. Current of medium intensity to SW, at sea-level surf.

6. Fadiffolu Atoll (see Fig. 1)

Inner reef of Madewaru
At the west side of the Atoll.
Station 100: reef flat, depth 1–2 m.
Station 101: reef edge, depth 5 m.
Station 104: reef slope, depth 4–6 m.
Station 105: reef flat, coral patch on sandy ground, depth 2–2.5 m.

7. Miladummadulu Atoll (see Fig. 1)

a) Inner reef at Kuludu
In the southeast of the atoll.
Station 107: reef flat, depth 2 m.

b) Reefs at Bodu Mandu (see GARDINER, 1903, p. 393, pl. XX)
Bodu Mandu is a ring-shaped, almost closed island of about 800 m diameter with a circular lagoon (called velu). The small entrance to the lagoon was too shallow for driving in with a motor-boat. Around the lagoon mangroves grew. The fringing reefs in the lagoon and around the island had narrow flats and steep descents.
Station 109: reef at the west side of Bodu Mandu, depth 4 m.
Station 110: reef in the lagoon (velu), depth 3 m.

B. CORAL FAUNA OF THE MALDIVE ISLANDS

I. Scleractinian Corals now known to occur in the Maldives

1. Check-list of Scleractinia

The check-list of Table 2 is based mainly on ALCOCK (1898, 1902), BERNARD (1903, 1905), GARDINER (1904, 1905, 1909), GARDINER & WAUGH (1938, 1939), VAN DER HORST (1926), MATTHAI (1914, 1924, 1928), WELLS & DAVIES (1966), SCHEER (1974) along with other scattered records in literature (SQUIRES, 1963, WELLS 1954, 1966, 1971) as well as on the present collection.

Table 2. Check-list of Scleractinia from the Maldive Archipelago with their known distribution in various atolls

The arrangement of the families and genera follows the systematic classification established by VAUGHAN & WELLS 1943 and revised by WELLS 1956. Within the genera the species are arranged alphabetically. Those species marked with an asterisk (*) are not discussed in the systematic part of this work.				Atolls of the Maldives															other localities
Order Scleractinia				Addu	Suvadiva	Haddumari	Kolumadulu	South Nilandu	Mulaku	Felidu	Ari	Rasdu	South Male	North Male	Gaha Faro	Horsburgh	South Malosmadulu	North Malosmadulu	Fadiffolu	Miladummadulu	
Sub-ord.	Families	Genera (Subgenera)	Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Astrocoeniina	Astrocoeniidae	Stylocoeniella	*guentheri (BASS-SMITH)	×																	
	Thamnasteriidae	Psammocora	contigua (ESPER)																	×	Throughout the Maldives
			*divaricata GARDINER	×	×																
			*nierstrazi HORST	×																	
		(Plesioseris)	*haimeana M. EDW. & H.	×		×															
		(Stephanaria)	*digitata M. EDW. & H.	×																	
			*folium UMBGR.	×																	
			togianensis UMBGR.	×							×	×		×		×			×		
	Pocilloporidae	Stylophora	mordax (DANA)	×							×	×							×		
			pistillata (ESPER)	×																	
			subseriata (EHRENB.)	×							×								×		
		Seriatopora	* angulata KLUNZ.	×																	
		Pocillopora	acuta LAMARCK	×								×									
			damicornis (LINN.)	×							×	×									
			danae VERRILL	×																	
			eydouxi M. EDW. & H.	×								×							×		
			ligulata DANA	×																	
			*meandrina var.nobilis VERR.	×																	
			molokensis VAUGH., new f. Ind. Ocean	×								×							×		
			verrucosa (ELL.&SOL.)	×							×	×							×		
	Acroporidae	Acropora	abrotanoides (LAMARCK)	×								×							×		
			complanata (BROOK)								×										
			concinna (BROOK)									×									

Sub-ord.	Families	Genera (Subgenera)	Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Astrocoeniina			*conigera (BROOK)	×																	
			*corymbosa (LAMARCK)	×							×	×							×		
			digitifera (DANA)	×																	
			echinata (DANA)									×									
			efflorescens (DANA)	×																	
			eibli new spec.	×								×									
			elseyi (BROOK), new f. Ind.Oc.	×																	
			*erythraea (KLUNZ)																		Without specif. locality
			eurystoma (KLUNZ)	×							×								×		
			formosa (DANA)	×							×	×							×		
			forskali (EHRENB.)	×																×	
			*haimei (M. EDW. & H.)																		Without specif. locality
			*hemprichii (EHRENB.)	×							×	×							×		
			humilis (DANA)	×							×	×							×		
			hyacinthus (DANA)	×								×		×							
			*hystrix (DANA)	×																	
			intermedia (BROOK)	×							×										
			irregularis (BROOK)	×							×	×							×		
			palifera (LAMARCK)	×							×	×							×		
			pharaonis (M. EDW. & H.)								×										
			quelchi (BROOK), n.f.Ind. Oc.	×																	
			reticulata (BROOK)	×																	
			*rotumana GARDINER	×																	
			squarrosa (EHRENB.)	×							×										
			stoddarti new spec.	×																	
			surculosa (DANA)	×								×									
			*syringodes (BROOK)	×																	
			teres VERRILL	×																	
			valida (DANA)									×									
			variabilis (KLUNZ.)	×								×									
			vasiformis (BROOK)								×	×									
		Astreopora	gracilis BERNARD	×																	
			*incrustans BERNARD	×																	
			listeri BERNARD	×								×									
			myriophthalma (LAMARCK)	×																	
			ocellata BERNARD	×															×		
		Montipora	danae M. EDW. & H.	×																	
			cf. floweri WELLS, n. f. Ind. Oc.	×																	
			*foliosa (PALLAS)	×																	
			informis BERNARD	×															×		
			maldivensis new spec.																×		
			prolifera BRÜGGEM., n.f.Ind.Oc.	×								×							×		
			*pulcherrima BERNARD	×																	
			sinensis BERNARD	×								×									
			sinuosa new spec.																	×	
			suvadivae new spec.		×																
Fungiina	Agariciidae	Pavona	* clavus DANA	×	×									×		×					
			duerdeni VAUGHAN																×		
			explanulata (LAMARCK)									×							×		
			*gardineri HORST	×																	
			maldivensis (GARDINER)	×								×		×			×		×		
			varians (VERRILL)	×				×			×	×							×	×	
			yabei new spec.												×						
		(Polyastra)	*acuticarinata (UMBGR.)	×																	
			*planulata EHRENB.	×																	
		(Pseudocolumnastrea)	pollicata WELLS, n.f.Ind.Oc.	×															×		
		Leptoseris	*fragilis M. EDW. & H.	×	×			×						×							
			gardineri HORST	×	×							×									
			*incrustans (QUELCH)	×	×			×		×				×			×				
			scabra VAUGHAN								×	×									
		Pachyseris	levicollis (DANA)	×	×							×		×							
			*speciosa (DANA)	×																	
			valenciennesi M. EDW. & H.	×							×								×		
		Gardineroseris	ponderosa (GARDINER)	×							×	×									

Sub-ord.	Families	Genera (Subgenera)	Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Fungiina	Siderastreidae	Coscinaraea	monile (FORSKAL)	×	×			×				×	×								
	Fungiidae	Cycloseris	* cooperi (GARDINER)											×			×				
			costulata (ORTMANN)								×								×		
			distorta (MICHELIN)	×	×			×	×	×				×			×				
			*sinensis M. EDW. & H.					×	×												
		Fungia (Ctenactis)	echinata PALLAS	×																	
		(Danafungia)	danai M. EDW. & H.	×																	
		(Fungia)	fungites (LINN.)	×	×						×	×									
		(Pleuractis)	scutaria LAMARCK	×							×	×		×							
		(Verrillofungia)	repanda DANA	×							×	×			×				×		
		Fungiacyathus	*sarsi GARD. & WAUGH						×												
		Herpetoglossa	*simplex (GARDINER)					×													
		Herpolitha	limax (ESPER)	×																	
			weberi (HORST), n.f.Ind.Oc.									×									
		Polyphyllia	talpina (LAMARCK)	×															×		
		Halomitra	philippinensis (STUDER)	×							×	×			×	×	×				
		Podabacia	*crustacea (PALLAS)													×					
		Sandalolitha	dentata QUELCH, n.f.Ind.Oc.												×						
			robusta (QUELCH)	×							×								×	×	
	Micrabaciidae	Stephanophyllia	*complicata MOSELEY																		S. of Horsburgh
			*fungulus ALCOCK																		SW. of Horsburgh
	Poritidae	Goniopora	duofaciata THIEL	×										×							
			granulosa, new name	×								×									
			minor CROSSLAND	×							×	×			×				×		
			planulata (EHRENB.)	×							×	×									
			cf. pulvinula WELLS new f. Ind.Oc.									×									
			stokesi M. EDW. & H.	×	×		×	×		×		×				×					
		Porites	*alveolata M. EDW. & H.	×								×									
			andrewsi VAUGHAN	×							×	×									
			lichen (DANA)	×								×							×		
			lutea M. EDW. & H.	×							×	×							×		
			murrayensis VAUGHAN									×									
			profundus REHBERG	×							×	×									
			solida (FORSKÁL)	×							×	×							×		
		(Synaraea)	*horizontalata HOFFMEISTER	×																	
			*monticulosa DANA	×																	
			convexa (VERRILL)	×	×						×	×									
		Alveopora	allingi HOFFMEISTER									×									
			daedalea (FORSKÁL)	×							×								×		
			mortenseni CROSSLAND	×								×									
			superficialis new spec.									×									
			*viridis QUOY & GAIM.	×																	
Faviina	Faviidae	Caulastrea	furcata DANA	×								×									
			tumida MATTHAI	×								×									
		Plesiastrea	versipora (LAMARCK)	×								×				×		×	×		
		Favia	favus (FORSKÁL)	×	×							×		×		×					
			pallida (DANA)	×							×	×		×	×	×					
			*rotumana GARDINER	×																	
			speciosa (DANA)	×								×		×	×				×		
			stelligera (DANA)	×							×	×							×		
			valenciennesii (M. EDW. & H.)	×															×		

Sub-ord.	Families	Genera (Subgenera)	Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Faviina		Favites	abdita (Ell. & Sol.)	×								×		×	×	×		×			
			*complanata (Ehrenb.)	×				×													
			ehrenbergi (Klunz.)	×								×									
			flexuosa (Dana)	×	×							×									
			halicora (Ehrenb.)	×										×		×	×				
			*hemprichi (Ehrenb.)	×																	
			melicerum (Esper)	×	×							×		×							
			*pentagona (Esper)	×	×								×	×							
			virens (Dana)	×	×							×		×							
		Goniastrea	*hombroni (Rousseau)											×							
			pectinata (Ehrenb.)	×							×	×				×	×				
			retiformis (Lamarck)	×							×	×		×		×			×		
		Platygyra	lamellina Ehrenb.	×							×	×		×	×				×		
		Oulophyllia	*aspera Quelch	×																	
			crispa (Lamarck)	×								×		×							
		Leptoria	phrygia (Ell. & Sol.)	×							×	×		×		×			×		
		Hydnophora	exesa (Pallas)	×								×		×							
			grandis Gardiner			×		×			×										
			microconos (Lamarck)	×								×		×		×	×				
			*tenella Quelch		×	×		×													
		Diploastrea	heliopora (Lamarck)	×								×			×						
		Leptastrea	*?immersa Klunz.	×										×							
			*purpurea (Dana)	×																	
			*solida M. Edw. & H.											×		×					Common in the Maldives
			transversa Klunz.	×								×		×		×					
		Cyphastrea	chalcidicum (Forskål)	×												×					
			microphthalma (Lamarck)	×	×						×	×	×				×				
			*serailia (Forskål)											×							
			*suvadivae Gardiner		×			×		×												
		Echinopora	hirsutissima M. Edw. & H.								×	×		×					×		
			lamellosa (Esper)	×								×		×	×				×		
		Trachyphyllia	*geoffroyi (Audouin)		×																
	Rhizangii-dae	Culicia	*?stellata Dana																		Throughout the Maldives
	Oculinidae	Galaxea	*clavus (Dana)	×									×	×							
			fascicularis (Linn.)	×	×							×		×			×		×		
			*hexagonalis (M. Edw. & H.)											×							
			lamarcki (M. Edw. & H.)					×		×		×									
		Sclerhelia	*formosa (Alcock)																		Off Maldives
	Merulinidae	Merulina	ampliata (Ell. & Sol.)	×								×		×		×					
	Mussidae	Cynarina	lacrymalis (M. Edw. & H.)	×																	
		Parascolymia	vitiensis (Brüggem.)	×								×									
		Acanthastrea	echinata (Dana)	×	×									×							
		Lobophyllia	corymbosa (Forskål)	×							×	×		×	×						
			*costata (Dana)	×																	
			*cf. hemprichii (Ehrenb.)	×																	
		Symphyllia	hassi new spec.									×									
			radians M. Edw. & H.	×								×		×		×					
			recta (Dana)	×								×		×	×	×			×		
			*valenciennesi M. Edw. & H.	×																	

Sub-ord.	Families	Genera (Subgenera)	Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Faviina	Pectiniidae	Echinophyllia	aspera (ELL. & SOL.)	×				×				×									
		Mycedium	tubifex (DANA)	×							×	×									
		Oxypora	lacera (VERRILL)	×						×		×				×					
		Physophyllia	ayleni WELLS									×									
		Pectinia	*alcicornis SAV.-KENT	×																	
			lactuca (PALLAS)	×				×													
Caryophylliina	Caryophyllii-dae	Caryophyllia	*cinticulatus (ALCOCK)																		Off Maldives
			*clavus (SCACCHI)																		Betw. S. Malosm.a. Fadiff.
			*grandis GARD. & WAUGH																		Kardiva Channel
			*mabahiti GARD. & WAUGH																		Betw.Malosm. and Fadiff.
		Trochocyathus	*rotulus ALCOCK																		Kardiva Channel
		Deltocyathus	*andamanicus ALCOCK																		SW. of Horsburgh
		Paracyathus	*conceptus GARD. & WAUGH																		S. of Horsburgh
			*gardineri VAUGHAN																		S. and SW. of Horsburgh
			*lifuensis GARDINER		×		×										×				
			*parvulus GARDINER																		Throughout the Maldives
		Heterocyathus	*aequicostatus M. EDW.&H.		×																SW. of Horsburgh
		Conotrochus	*brunneus (MOSELEY)																		Kardiva Channel
		Stephanocyathus	*nobilis (MOSELEY)																		S.and SW. of Horsburgh
		Discotrochus	*dentatus (ALCOCK)																		S.and SW. of Horsburgh and Kardiva Channel
		Tropidocyathus	*cooperi GARDINER		×		×														
		Euphyllia	fimbriata (SPENGLER)	×																	
			glabrescens (CHAM. & EYS.)	×										×							
			turgida (DANA)	×				×				×		×							
		Catalaphyllia	*plicata (M. EDW. & H.)	×													×				
		Plerogyra	sinuosa (DANA)	×								×									
		Physogyra	lichtensteini M. EDW. & H.	×											×						
	Flabellidae	Flabellum	*pavonium LESSON		×				×					×							S. and SW. of Horsburgh
			*stokesii (M. EDW. & H.)																		SW. of Horsburgh
Dendrophylliina	Dendrophyll-iidae	Balanophyllia	*affinis (SEMPER)						×												
			*cornu MOSELEY																		S. of Horsburgh
			*diffusa (HARR. & POOLE)																		S. and SW. of Horsburgh
			*diomedeae VAUGHAN																		S. of Horsburgh
			*italica (MICHELIN)													×					
			*ponderosa HORST					×									×				
		Dendrophyllia	*ampheloides ALCOCK																		SW. of Horsburgh
			arbuscula HORST								×				×						
			*cornigera (LAMARCK)					×													
			*fistula (ALCOCK)																		S.of Horsburgh
			*horsti GARD. & WAUGH																		S.of Horsburgh
			micranthus (EHRENB.)	×	×		×				×			×	×	×		×	×	×	
			*minuscula BOURNE																		S.of Horsburgh
			*ramea (DUNCAN)																		S.of Horsburgh
			*robusta (BOURNE)							×											
			*serpentina (VAUGHAN)																		SW.of Horsburgh
		Heteropsammia	*michelini M. EDW. & H.		×	×											×			×	
		Endopsammia	philippensis M. EDW. & H.	×										×		×					
		Psammoseris	*rousseaui M. EDW. & H.			×															

Sub-ord.	Families	Genera (Subgenera)	Species	1 2 3 4	5 6 7 8	9 10 11 12	13 14 15 16 17	18
Dendrophylliina	Pectiniidae	Tubastraea	aurea (QUOY & GAIM.)	×	×	× ×	×	
			*coccinea (EHRENB.)		×			S.of Horsburgh
			*diaphana (DANA)	×				
		Turbinaria	marmorea REHB., new f. Ind. Oc.		×			
			mesenterina (LAMARCK)	×	×	×		
			peltata (ESPER)	×				

Notes on some Maldivian corals listed by GARDINER (1904, 1905) and BERNARD (1903, 1905), but not mentioned in the check-list.

a) *? Mycetophyllia lamarckana* M. EDW. & H. (GARDINER, 1904):
Mycetophyllia is a West Indian genus. The Maldivian specimen so named by GARDINER may belong to a species of *Symphyllia*. We have not examined GARDINER's material.

b) *Merulina prolifera* QUELCH (GARDINER, 1904):
According to MATTHAI (1928) *M. prolifera* QUELCH is the same as *M. laxa* (DANA). However, MATTHAI repeatedly (p. 127, 135) ascertains that GARDINER's Maldivian specimens named as *M. prolifera* does not belong to the genus *Merulina*. We have not seen the specimens.

c) *Siderastrea lilacea* KLUNZINGER and

d) *Siderastrea sphaeroidalis* ORTMANN (GARDINER, 1905):
Siderastrea GARDINER (1905) is not *Siderastrea* DE BLAINVILLE but only *Pavona*. GARDINER's *S. lilacea* is certainly not conspecific with KLUNZINGER's (1879b), which is probably a valid species of *Siderastrea* from Red Sea and Western Indian Ocean. The identity of both *S. lilacea* and *S. sphaeroidalis*, recorded from the Maldives by GARDINER, is doubtful and can be solved only by examination of the types.

e) The following species described by BERNARD (1903, 1905) also await determination:
Goniopora Maldives 3 (BERNARD, 1903),
Porites Maldives 1, Maldives 2 and *Maldives 3* (BERNARD, 1905).

2. Review of the Results

Table 2 shows a list of all the 241 scleractinian corals now known to occur in the different atolls of the Maldive Archipelago. In Table 3 the numbers of the genera and species for these atolls are summarized.

The number of species recorded from different atolls seems to be directly proportional to the time and efforts spent on collecting; in other words, more intensive collecting has yielded more number of species than from sites casually investigated. In Addu Atoll for example GARDINER (1903) as well as the British Expedition under STODDART (1966) and the "Xarifa" Expedition (present report) have collected. In Rasdu Atoll, the place with the next greater species number, the "Xarifa" stood almost three weeks, but in the Ari Atoll and Fadiffolu Atoll, next in the species numbers, only eight and twelve days respectively. The atoll with the next following species number is North Male, here GARDINER was for the longest time (GARDINER, 1903a).

In Table 3, 55 hermatypic genera from the Maldives are listed, of which 50 are also mentioned by ROSEN (1971). He lists 51 genera as positive and one (*Siderastrea*) as doubtful for the Maldives. *Anacropora* listed by ROSEN is not included in our schedule, while we have *Sandalolitha* (= *Parahalomitra*), *Parascolymia, Physophyllia, Catalaphyllia* and *Physogyra*, that are not mentioned earlier. Of these, *Catalaphyllia* is already recorded from the Maldives as *Euphyllia*.

Table 3. Numbers of hermatypic and ahermatypic coral species and genera in the different atolls of the Maldives, according to Table 2.

	Atolls	number of species	number of genera	ahermat. corals species	ahermat. corals genera	hermatypic corals species	hermatypic corals genera
1	Addu	161	53	4	3	157	50
2	Suvadiva	28	22	6	6	22	16
3	Haddumati	5	4	2	2	3	2
4	Kolumadulu	4	4	3	3	1	1
5	South Nilandu	18	14	2	2	16	12
6	Mulaku	5	4	3	3	2	1
7	Felidu	8	8	2	2	6	6
8	Ari	51	26	3	2	48	24
9	Rasdu	93	42	–	–	93	42
10	South Male	4	4	–	–	4	4
11	North Male	45	27	4	4	41	23
12	Gaha Faro	18	16	3	2	15	14
13	Horsburgh	25	20	4	4	21	16
14	South Malosmadulu	14	13	3	3	11	10
15	North Malosmadulu	3	3	1	1	2	2
16	Fadiffolu	45	24	1	1	44	23
17	Miladummadulu	6	6	2	2	4	4
18	other localities	33	18	29	15	4	3
Maldives together		241	75	44	20	197	55
		18 Families					
"Xarifa" Expedition		147	52	4	3	143	49
		14 Families					

As shown in Table 3, the Maldivian coral fauna includes 197 species belonging to 55 genera of hermatypic and 44 species of 20 genera of ahermatypic forms. The "Xarifa" material was found to contain 143 species of hermatypes divided among 49 genera, and 4 ahermatypes of 3 genera. Eight of the species are described here as new to science, while one of BERNARD's (1903) *Goniopora* was given a new binominal name. Ten of the species are recorded for the first time from the Indian Ocean.

Many of the Maldivian atolls are still poorly investigated for their coral fauna (Table 3). More intensive collecting may bring forth additional species, and it is likely that the species number of hermatypic corals may rise to nearly 210. Genera such as *Madracis* may occur in the deeper waters of the Maldives, since this genus is found in the Gulf of Mannar and the Western Indian Ocean (PILLAI, unpubl.). Similarly *Anomastrea* and *Coeloseris* are the other two hermatypic genera still awaiting discovery from Maldivian reefs. *Siderastrea* may possibly occur in the Maldives, too.

The 147 collected corals are grouped systematically in Table 4 with specifications at which stations they were found and how frequently they occur there.

Table 4. Coral species collected during the Xarifa Expedition 1957/58 on different places in the Maldive Islands (Indian Ocean)

Signs for the frequency of the coral species:
- • rare
- + sparsely present
- – more frequently present
- ■ abundant
- ○ predominant
- × present, without statement of frequency

		Addu Atoll																																		Suvadiva Atoll		Ari Atoll													Rasdu Atoll													Gaha Faro			Fadiffolu Atoll				Miladummadulu Atoll		
		inner reefs						lagoon bottom			outer reefs					northern reef flat				patch reefs						Xarifa Reef																	lagoon													Weligandu										lagoon bottom												
		no specific area	Hittaddu			Abuhera/Hankada	Gan	Wreck		Gan	Hittaddu		Gan	north		Kudu Kanda Channel, east of		west of		Bacon	Mini Atoll	P.R.1	P.R.2	P.R.4	P.R.5												Wreck	Fulu	Faro NW of Fusdu					Mini Atoll	Patch Reef	Great Faro			Fusdu	Malos		inner reef						outer reef				Weligandu		Channel	Patch reef		Outer reef	Inner reef		Madewaru		Kuludu	Bodu Mandu	
		16	17	18	19	20	57	31	32	56	34	43	58	46	47	48	49	50	51	26	39	55	54	53	41	24	29	35 + Z.12	45 + Z.5	Z.2	Z.3	Z.6	Z.7	Z.9	Z.10	Z.12/13	61	63	65	66	67	68	69	71	72	73	75	76	74	199	200	81	82	83	84	85	86	87	89	90	92	88	91	93	94	97	95	100	101	104	105	107	109	110
Family Thamnasteriidae																																																																										
Psammocora	contigua																																																																									–	
	togianensis					•																											•							•																																		
Family Pocilloporidae																																																																										
Stylophora	mordax			–							■																■																																																	
	pistillata	×	–	–												■					–																																																					
	subseriata																																						–																																	•				
Pocillopora	acuta																																																									•				•												
	damicornis			–																										–													■																																
	danae		•																																																																								
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	ligulata											•																																																														
	molokensis (n.f. Ind.Oc.)							–					–																																																												
	verrucosa		–																																																																							
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Acropora	abrotanoides	×	■																					–																																				+														
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	concinna																																																				+	•																					
	digitifera	×		+																									+																																														
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	efflorescens		+																														■	■	■																																									
	eibli (n.sp.)																								+																																					+												
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	forskali		•																																																																						×		
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	hyacinthus		–																										–																																					×								
	intermedia																																								•																																			
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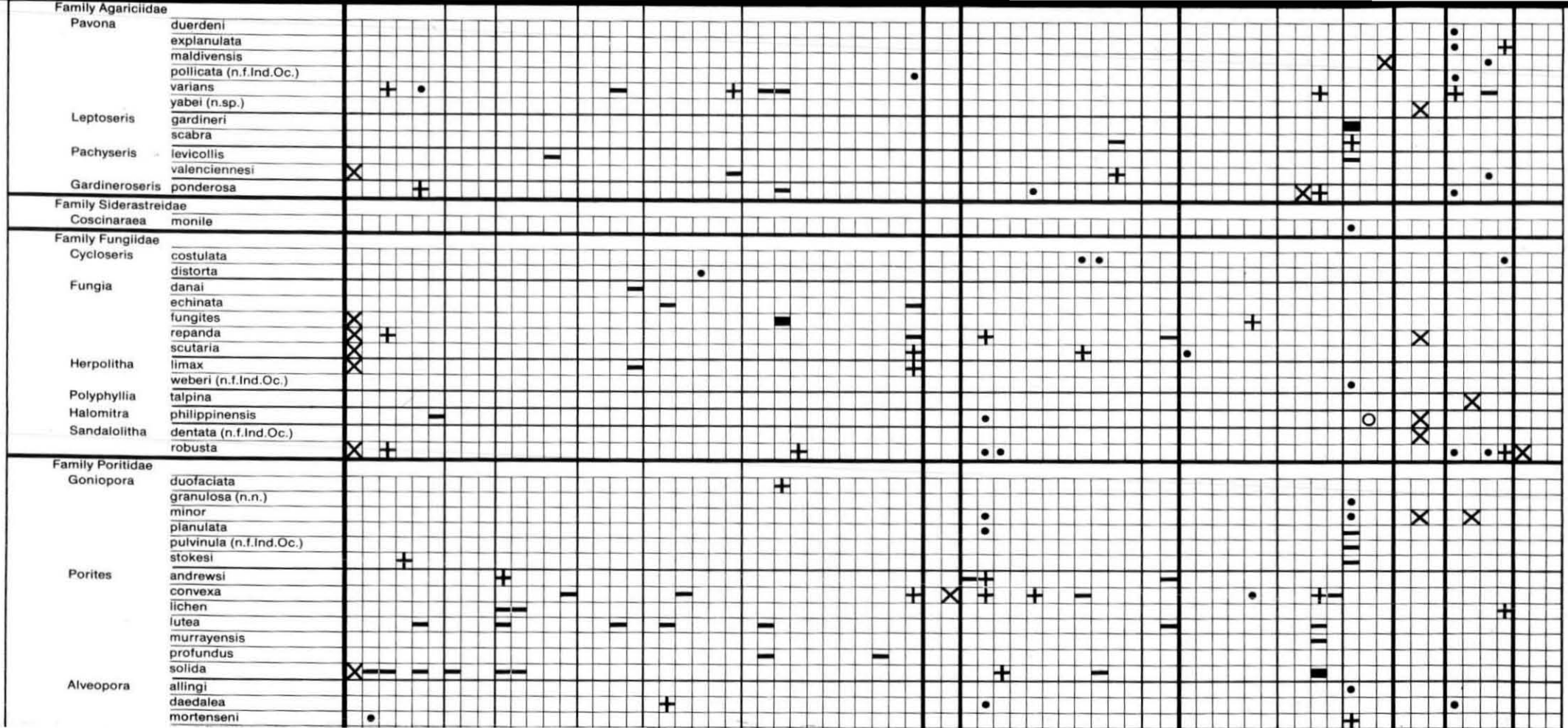
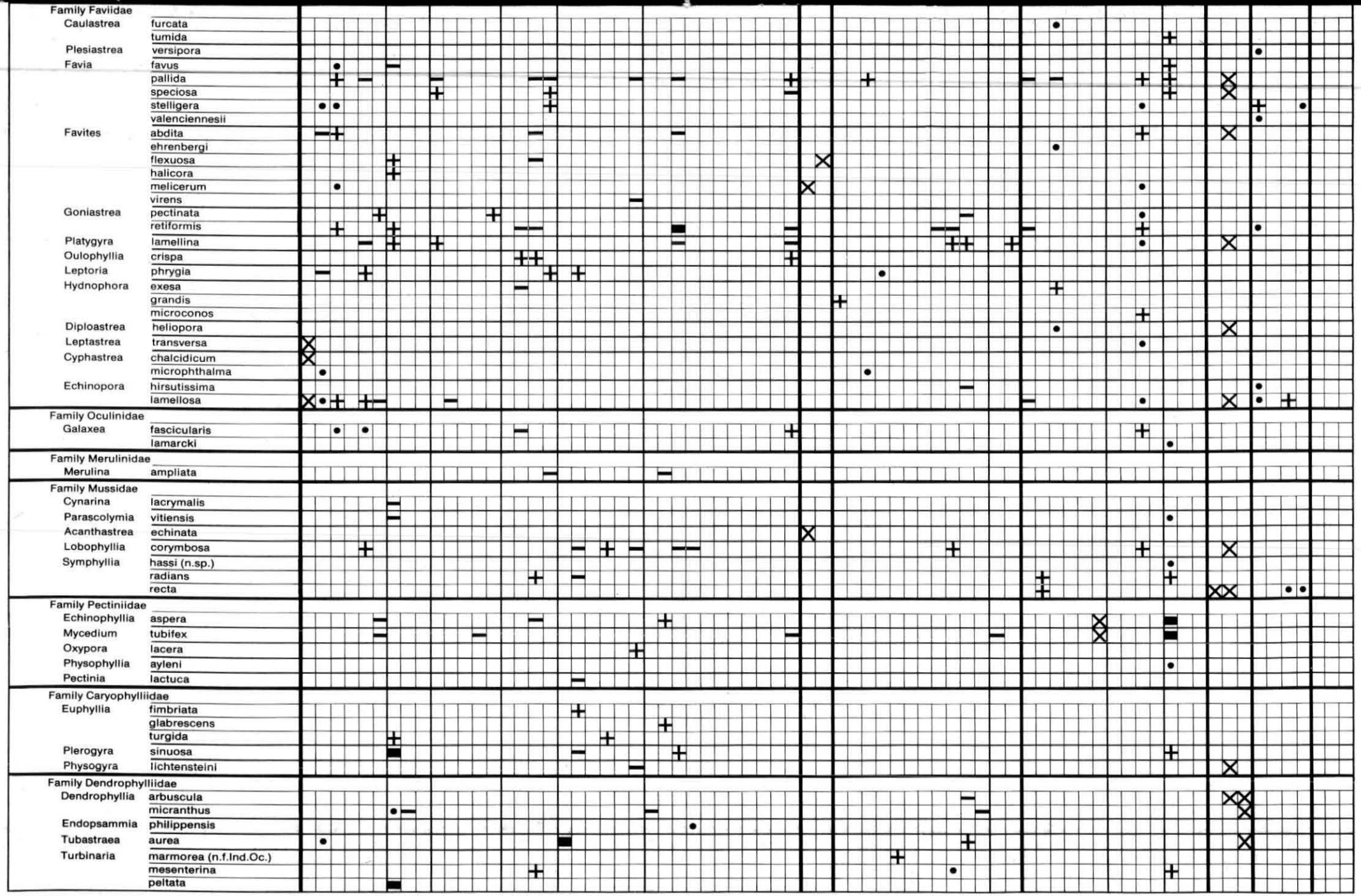
	valida																																																			•																						
	variabilis											–																	■																																													
	vasiformis																																								–	–										•																						
Astreopora	gracilis						–																																																																				
	listeri																	–																																										•														
	myriophthalma																																			•																																							
	ocellata					•																																																														•						
Montipora	danae																										+																																																
	floweri (n.f.Ind.Oc.)			•																																																																							
	informis																					–		–																																												•						
	maldivensis (n.sp.)																																																																				×	•				
	prolifera (n.f.Ind.Oc.)																										–									+																			•																×	+				
	sinensis																																																					•																					
	sinuosa (n.sp.)																																																																										•
	suvadivae (n.sp.)																																					×																																							


Family Agariciidae
Pavona
duerdeni
explanulata
maldivensis
pollicata (n.f.Ind.Oc.)
varians
yabei (n.sp.)
Leptoseris
gardineri
scabra
Pachyseris
levicollis
valenciennesi
Gardineroseris
ponderosa
Family Siderastreidae
Coscinaraea
monile
Family Fungiidae
Cycloseris
costulata
distorta
Fungia
danai
echinata
fungites
repanda
scutaria
Herpolitha
limax
weberi (n.f.Ind.Oc.)
Polyphyllia
talpina
Halomitra
philippinensis
Sandalolitha
dentata (n.f.Ind.Oc.)
robusta
Family Poritidae
Goniopora
duofaciata
granulosa (n.n.)
minor
planulata
pulvinula (n.f.Ind.Oc.)
stokesi
Porites
andrewsi
convexa
lichen
lutea
murrayensis
profundus
solida
Alveopora
allingi
daedalea
mortenseni


Family Faviidae
Caulastrea furcata
tumida
Plesiastrea versipora
Favia favus
pallida
speciosa
stelligera
valenciennesii
Favites abdita
ehrenbergi
flexuosa
halicora
melicerum
virens
Goniastrea pectinata
retiformis
Platygyra lamellina
Oulophyllia crispa
Leptoria phrygia
Hydnophora exesa
grandis
microconos
Diploastrea heliopora
Leptastrea transversa
Cyphastrea chalcidicum
microphthalma
Echinopora hirsutissima
lamellosa
Family Oculinidae
Galaxea fascicularis
lamarcki
Family Merulinidae
Merulina ampliata
Family Mussidae
Cynarina lacrymalis
Parascolymia vitiensis
Acanthastrea echinata
Lobophyllia corymbosa
Symphyllia hassi (n.sp.)
radians
recta
Family Pectiniidae
Echinophyllia aspera
Mycedium tubifex
Oxypora lacera
Physophyllia ayleni
Pectinia lactuca
Family Caryophylliidae
Euphyllia fimbriata
glabrescens
turgida
Plerogyra sinuosa
Physogyra lichtensteini
Family Dendrophylliidae
Dendrophyllia arbuscula
micranthus
Endopsammia philippensis
Tubastraea aurea
Turbinaria marmorea (n.f.Ind.Oc.)
mesenterina
peltata

II. Systematic Description of the Collected Corals

Phylum Coelenterata FREY & LEUCKART, 1847
Subphylum Cnidaria HATSCHEK, 1888
Class Anthozoa EHRENBERG, 1834
Subclass Zoantharia DE BLAINVILLE, 1830
Order Scleractinia BOURNE, 1900

1. Suborder Astrocoeniina VAUGHAN and WELLS, 1943

a) Family **Thamnasteriidae** VAUGHAN and WELLS, 1943

Genus *Psammocora* DANA, 1846

Psammocora contigua (ESPER), 1797

Psammocora contigua

GARDINER, 1905, p.951; (synonymy).
HORST, 1921, p. 33.
HOFFMEISTER, 1925, p. 45; pl. 5, figs.la, lb, 2a, 2b.
FAUSTINO, 1927, p. 211; pl. 70, figs.1, 2.
YABE, SUGIYAMA & EGUCHI, 1936, p. 59;
pl. 44, figs. 5, 6, 8; pl. 45, figs. 2, 3, 6
UMBGROVE, 1939, p. 51.
UMBGROVE, 1940, p. 299.
NEMENZO, 1955, p. 23; pl. 5, figs.1, 3; pl. 6, Fig.4.

One specimen in the present collection represents this species. The corallum is tufted, ramose. The calices are arranged in longitudinal rows. Septa 8 to 10, alternating in size but the major ones are not excessively thickened, though essentially club-shaped. The specimen was unattached at the time of collection. This species often grows as free lying colonies, especially in sandy bottom. One of us (PILLAI, 1971) has collected several such colonies from the sandy lagoon bottom of Minicoy Atoll. According to GARDINER (1905) this species is an important reef builder throughout Maldives and Minicoy. In 1969 PILLAI found it as not fairly common in Minicoy. In 1958 it was not very common in the Maldives, from where the present collection was made. WELLS & DAVIES' (1966) preliminary list of corals from the Addu Atoll does not include this species.

Material examined: X2:109-1, Bodu Mandu, Miladummadulu Atoll.

Distribution: Madagascar; Seychelles; Maldives; Minicoy; Mandapam (Southeast India); Andamans; Singapore; Bay of Batavia; Philippines; Palau Islands; Marshall Islands; Funafuti; Fiji; Samoa.

Psammocora (Stephanaria) togianensis UMBGROVE, 1940

(Plate 1, Fig. 1)

Psammocora togianensis

PILLAI et al., 1973, p.457; pl.1, fig.2.
UMBGROVE, 1940, p. 299; pl. 29, fig. 3;
pl. 30, fig. 1; pl. 31, figs. 3, 4.
WELLS, 1950, p. 43.
WELLS, 1954, p. 410; pl. 156, figs.6, 7.

Psammocora exesa

GARDINER (non DANA) 1905, p.952; pl.92, fig.22.
HORST, 1921, p. 34.
YABE, SUGIYAMA & EGUCHI, 1936, p. 59; pl. 44, figs.3, 4.
NEMENZO, 1955, p. 25; pl. 5, fig.2.
PILLAI, 1971, p.. 7.

WELLS (1954) states that DANA's (1846) type of *P. exesa* is a *Coscinaraea* close to *C. fossata*. He also suggests that the specimen figured by YABE, SUGIYAMA & EGUCHI (1936) is a variety of *P. togianensis* and not *exesa* DANA. WELLS in a personal communication opined that the Maldivian specimen figured by GARDINER (1905) under the name *P. exesa* could be *P. togianesis.* Most of the subsequent workers based on GARDINER for the identification of their specimens and as such they belong to *P. togianensis.* However, we require a good illustration and description of DANA's type of his *P. exesa* to understand what exactly it looks like. The present collection includes 6 specimens, all parts of heavy vertical columns. The surface of the coralla have a rough appearance. Distance between adjacent calices 2 to 2.5 mm. Axial fossa about 0.5 mm, filled by a columellar style. Septa alternating in size, the major septa are club-shaped and abundantly granulose. The calices are superficial to 1.5 mm deep in different specimens.

Material examined: X2: 20–6, Inner reef, Abuhera, Addu Atoll; X2: Sch-48(1, 2), Xarifa Reef, Addu Atoll; X2: 66–4(1, 2), Faro, Ari Atoll.

Distribution: Seychelles; Maldives; Minicoy; Cocos-Keeling Islands; Philippines; Celebes; Great Barrier Reef; Japan; Palau Islands; Caroline Islands; Marshall Islands.

b) Family **Pocilloporidae** GRAY, 1842

Genus *Stylophora* SCHWEIGGER, 1819

Stylophora mordax (DANA), 1846

Sideropora mordax	DANA, 1846, p.518; pl.49, figs.1, 1a–c.
Stylophora mordax	VAUGHAN, 1918, p.81; pl.25, figs.1, 1a, 2, 2a, 2b.
	YABE, SUGIYAMA & EGUCHI, 1936, p. 15; pl. 3, fig. 2.
	UMBGROVE, 1939, p. 23.
	WELLS, 1954, p. 411; pl. 96. fig. 5.

One of our specimens (X2: 29-4) has a massive appearance with very thick branches up to 2.5 cm broad. A notable feature of this specimen is the crowded calices and very prominent hoods with deep striations as in *S. septata* GARDINER. But there is only one cycle of septa. The rest of the specimens has thinner branches. It is quite possible that S. *palmata* is same as *S. mordax.*

Material examined: X2: 18-18, Inner reef, Hitaddu, Addu Atoll; X2: 29-4, Xarifa Reef, Addu Atoll; X2: 34-10, Outer reef, Hitaddu, Addu Atoll.

Distribution: Maldives; Laccadives; Nicobars; Singapore; Bay of Batavia; Mariana Islands; Palau Islands; Caroline Islands; Marshall Islands; Fiji; Fanning Island.

Stylophora pistillata (ESPER), 1797

Stylophora pistillata	MARENZELLER, 1906, p.77; pl.26, figs. 94–98; pl.29, figs. 94a–98a.
	VAUGHAN, 1918, p.80; pl.26, figs. 1, 1a.
	THIEL, 1932, p.32; pl.3, figs. 2,3.
	YABE, SUGIYAMA & EGUCHI, 1936, p.15; pl.3, fig.1.
	CROSSLAND, 1952, p.107.
	WELLS, 1954, p.411.
	STEPHENSON & WELLS, 1956, p.10.
	NEMENZO, 1964, p.204; pl.4, fig.1.
	SCHEER, 1964, p.453.

Seven specimens are referred to this species. One of them (X2: 39–3) resembles KLUNZINGER's (1897a) plate 7 fig. 8 (= *S. prostrata)* in growth-form. X2: 48-1 is a thick branch with a basal diameter of 12 mm. In X2: 18-28, the branchlets are a little bit flattened at the top and some are up to 10 mm broad. Another specimen (X2: 17-17) is an entire colony with radiating branches. In this specimen the tip of branches are either narrow or flattened. The rest of the specimens are either entire colonies or parts of larger coralla. In all the specimens the calices vary from 0.8 to 1mm in diameter. The distal part of the wall is raised up in most cases, though in calices of the basal parts of certain branches they are not at all

elevated. Six septa are mostly well developed joining to a styliform columella. Rarely (e.g. in X2: 17-17) a second cycle of septa is visible.

Material examined: X2: 16-6, Addu Atoll; X2: 17-7, X2: 18-28(1–3), Inner reef, Hitaddu, Addu Atoll; X2: 39-3, Mini-Atoll, Addu Atoll; X2: 48-1, Northern reef flat, Addu Atoll.

Distribution: Red Sea eastword to Samoa, but does not occur along the coast of India.

Stylophora subseriata (EHRENBERG), 1834

Stylophora subseriata
KLUNZINGER, 1879a, p.65; pl.7, fig.10, pl.8, fig.14.
MARENZELLER, 1906, p.74; pl.26, figs. 90–93; pl.29, figs. 90a–93a.
GRAVIER, 1911, p.28.

The following is a description of the present specimens:

Corallum cespito – arborescent. Main branches 6 mm thick at the base, repeatedly dividing. Branches rounded, branchlets 1 to 1.5 cm long, 3 to 4 mm thick; tips of branchlets a little flattend. Calices rounded or slightly oval, 0.6 to 0.7 mm in diameter, three in 5 mm length of branch; moderately deep. Wall of the corallites only very slightly projecting, visible under a lens. Primary cycle of septa moderately developed, projecting to half-radius circle. In a few calices 1 or 2 secondaries can also be seen.

Six septa descent down and reach a styliform columella. The coenenchyme is covered with small spines that form a circle around the calyx. Between the calices they look like grains.

Material examined: X2: 65–5, Faro, Ari Atoll; X2: 104–10, Inner reef, Madewaru, Fadiffolu Atoll.

Distribution: Red Sea; French Somaliland; Maldives.

Genus *Pocillopora* LAMARCK, 1816

Pocillopora acuta LAMARCK, 1816

(Plate 1, Fig. 2)

Pocillopora acuta
DANA, 1846, p.524.
MILNE EDWARDS (& HAIME), 1860, p. 302; pl. F. 4, fig. 2a, b; (synonymy).

Description of the present specimens: Corallum composed of slender branches resembling *Seriatopora* in general habit. The branches arise from a central stem 10 mm thick. Greater diameter of the colony 10 cm. Branches spreading, not vertical, with branchlets. Branchlets 1.5 to 2 cm long, average 2 mm thick with acute tips. Verrucae almost absent. A few verruciform structures present are really beginnings of branchlets. Calices rounded or oval, shallow, about 1 mm in diameter, 1 to 2 mm apart. The bottom of the calicinal cavities smooth. The coenenchyme minutely graunular. At the tip of branchlets the coenenchymal ornamentation attains the maximum length and gives a spiny appearance to the branch tips.

A second specimen (X2: 87–2) has thicker branchlets and grades towards slender specimens of *P. damicornis*, but lacks any verrucae. The nature of the calices is same as in the specimen already described.

Material examined: X2: 87–2, Outer reef, Weligandu, Rasdu Atoll; X2: 88–15, Lagoon, Rasdu Atoll.

Distribution: Maldives; Australia (New Holland);? Solomon Islands.

Remarks: The present species, which is the type of the genus, is characterized by slenderly branched corallum without well developed verrucae and septa. The „Challenger" specimen reported by QUELCH (1886) as belonging to this species has been reexamined by us and it is but *P. damicornis*. FAUSTINO's (1927) figure of this species is only a reproduction of QUELCH's. VAUGHAN (1918) has correctly placed BEDOT's (1907) *P.acuta* in *P.damicornis*. It seems that *P.acuta* is recorded after DANA (1846) only by WELLS & DAVIES (1966) from Addu Atoll after a gap of nearly 120 years.

Pocillopora damicornis (LINNAEUS), 1758

Pocillopora damicornis
HOFFMEISTER, 1925, p. 15; pl. 1, fig. 1; (synonymy).
DURHAM, 1962, p. 47.
NEMENZO, 1964, p. 212; pl. 8, fig. 2.

We have (SCHEER & PILLAI, 1974) recently considered this species from Nicobar Islands and therein have given a list of synonyms and literature. The present collection includes four specimens of this species. One specimen (X2: 69–3) seems to be referable to typical *damicornis,* while the rest of the specimens is var. *cespitosa.*

Material examined; X2: 18–8, 18–26, Inner reef, Hitaddu, Addu Atoll; X2: Sch-52, Xarifa Reef, Addu Atoll; X2: 69–3, Faro, Ari Atoll.

Distribution: Red Sea eastward to the western coast of America.

Pocillopora danae VERRILL, 1864

Pocillopora danae

VAUGHAN, 1918, p. 77; pl. 22, figs. 1, 1a, 2; (synonymy).
FAUSTINO, 1927, p. 103; pl. 13, fig. 3.
THIEL, 1932, p. 27; pl. 1, fig. 7.
CROSSLAND, 1952, p. 110.
WELLS, 1954, p. 412.
NEMENZO, 1964, p. 210; pl. 7, fig. 1.

Two bushy clumps, both parts of the same colony, belong to this species. They are 12.5 cm in height. The basal part is rounded. Top of branchlets flattened, 20 to 26 mm broad. Apices with well developed verrucae. Verrucae 2 to 3 mm thick and 3 to 5 mm long, rounded at the tip or dome-shaped at the lower parts of the corallum. Older calices have 12 well developed septa.

Material examined: X2: 17–23 (a,b), Inner reef, Hitaddu, Addu Atoll.

Distribution: Mauritius; Maldives; Gulf of Mannar (PILLAI, 1971 b); Banda Sea; Murray Islands; Great Barrier Reef; Fiji; Tahiti.

Pocillopora ligulata DANA, 1846

Pocillopora ligulata

DANA, 1846, p. 531; pl. 50, figs. 2, 2a.
MILNE EDWARDS (& HAIME), 1960, p. 306.
VAUGHAN, 1907, p. 94; pl. 16, figs. 1, 1a; pl. 17, figs. 2, 2a; pls. 18–21.
YABE, SUGIYAMA & EGUCHI, 1836, p. 13; pl. 3 fig. 5; pl. 5, fig. 2.
WELLS, 1954, p. 413; pl. 99, figs. 3, 4.

The species is represented in the present collection by a branch that has a superficial resemblance to the specimens of *P.danae,* but the calicular characters are quite different. The calices are nearly 0.7 mm in diameter, close together; 2 cycles of septa are well developed in most of the calices with a styliform columella. The verrucae are spreading, with rounded tips. Growing tips of branchlets without any verrucae.

Material examined: X2: 43–7, Outer reef, Hitaddu, Addu Atoll.

Distribution: Maldives; Minicoy (PILLAI, 1971); Palau Islands; Caroline Islands; Marshall Islands; Solomon Islands; Cook Islands (STODDART & PILLAI, 1973.); Hawaii.

Pocillopora molokensis VAUGHAN, 1907

(Plate 1, Fig. 3)

Pocillopora molokensis

VAUGHAN, 1907, p. 91; pl. 15; pl. 16, figs. 2, 2a.

The growth-form of the present specimens is semi-arborescent. The longest branch is 12 cm long with a basal diameter of 2 cm. The branches and branchlets are rounded. The tips of branchlets are mostly rounded, rarely flattened. Branchlets 1 to 3 cm long, 1.5 cm thick. Verrucae are perpendicular to the branch surface, rounded at the midlength of the branchlets getting elongated towards the upper part of the branchlets. At the basal part of the branchlets and on the branches verrucae are poorly developed or absent. Height of verrucae 2 to 4 mm, thickness 2 to 4 mm. Calices on the verrucae polygonal, rounded at the older parts of the corallum. They are 0.8 to 1.2 mm in diameter. Septa and columella obsolete. Other details show no variation from the original description of the species given by VAUGHAN (1907).

Material examined: X2: 31–8, 31–20, Wreck, Addu Atoll; X2: 58–2, Outer reef, Gan, Addu Atoll.

Distribution: Maldives; Hawaii.

This is the first record of the species from the Indian Ocean.

Remarks: In growth-form and general apperarance the present specimens are very near to *P. solida* QUELCH, 1886. QUELCH's type of his *P. solida* in British Museum (Natural History), London, has larger calices and lesser developed septa than in the present specimens. In calicular characters as well as in the nature of verrucae our specimens agree more with VAUGHAN's description of *P.molokensis* than to *P.solida.* In fact, the present suite is intermediate in characters between the two species. According to VAUGHAN (1907) the major difference is in the nature of the branchlets. In *P.solida* the ends of the branchlets "are thick and swollen, whereas in *P.molokensis* they are neraly always decidedly small". We feel this distinction is not much reliable. But the number of calices on verrucae seem to be a more prominent difference between the two. *P.molokensis* has larger verrucae than in *P.solida* but smaller calices. In *P.solida* there are only 2 to 4 calices on a verruca while in *P.molokensis* there are 8 to 12 calices (as in the present specimens) on a verruca. The growth-form is mostly same in both the species. Examination of more specimens is necessary to ascertain their relationship.

Pocillopora verrucosa (ELLIS & SOLANDER), 1786

Pocillopora verrucosa	VAUGHAN, 1918, p. 77; pl. 23, figs. 1, 2a, 2.
	FAUSTINO, 1927, p. 104; pl. 14, fig. 1.
	YABE, SUGIYAMA & EGUCHI, 1936, p. 14; pl. 3, figs. 3, 4.
	UMBGROVE, 1939, p. 22
	WELLS, 1950, p. 34; pl. 9, fig. 2
	CROSSLAND, 1952, p. 111
	WELLS, 1954, p. 413; pl. 98, figs. 5, 6.
	NEMENZO, 1964, p. 209

One branch belongs to this species. The verrucae are irregular in size and shape. The tip of branch is naked. Septa and columella recognizable in older calices. This species is very close to *P.meandrina nobilis.* See PILLAI & STODDART (Ms 1) for their differences.

Material examined: X2 17–11, Inner reef, Hitaddu, Addu Atoll.

Distribution: ? Red Sea (CROSSLAND, 1952); Madagascar; Mauritius; Maldives; Andamans (PILLAI, 1972); Cocos-Keeling Islands; East Indies; Philippines; Great Barrier Reef, Low Isles; Japan; Palau Islands; Marshall Islands.

Pocillopora eydouxi MILNE EDWARDS & HAIME, 1860.

Pocillopora eydouxi	MILNE EDWARDS (& HAIME,) 1860, p. 306; pl. F 4, fig. 1a.
For further literature and synonymy see SCHEER & PILLAI (1974).	

There are three specimens of this species in the present collection. Two of them are entire colonies. One (X2: 17–10) is a flabellate branch from a large corallum. The apices of the branches in all the three specimens are without verrucae. This species is one among the *Pocillopora* with small calices and well developed septa. We have fully discussed the possible skeletal and calicular variation of this species based on specimens from Nicobar Islands.

Material examined: X2: 16–11, 16–14, X2: 17–10, Inner reefs, Addu Atoll.

Distribution: Maldives; Minicoy; and then eastward to Hawaii. For detailed distribution see SCHEER & PILLAI (1974).

c) Family **Acroporidae** VERRILL, 1902

Genus *Acropora* OKEN, 1815

Acropora formosa (DANA), 1846

Madrepora formosa	DANA, 1846, p. 473; pl. 31, fig. 2; pl. 38, fig. 4.
	BROOK, 1893, p. 43.
Acropora formosa	HOFFMEISTER, 1925, p. 55; pl. 8, figs. 1–3; (synonymy).
	WELLS, 1954, p. 415; pl. 102, figs. 1–9; pl. 103, figs. 1–5; pl. 104, fig. 4.
	STEPHENSON & WELLS, 1956, p. 14.
	NEMENZO, 1967, p. 61; pl. 21, fig. 3.

Eleven specimens are placed under this species. The branches are 10 to 12 mm in thickness. The radial corallites are either ascending or spreading, ranging from 1.5 to 2 mm in diameter.

Material examined: X2: 16–8, Addu Atoll; X2: 17–20 and 17–21, Inner reef, Hitaddu, Addu Atoll; X2:Sch–36, 38, 39, 42, 44 and 47, Xarifa Reef, Addu Atoll; X2: 57—7, Inner reef, Gan, Addu Atoll; X2: 92–2, Outer reef, Weligandu, Rasdu Atoll.

Distribution: East African coast (TALBOT, 1965) to Tuamotu Archipelago. For specific geographic areas see SCHEER & PILLAI (1974).

Acropora intermedia (BROOK), 1891

(Plate 2, Fig. 1)

Madrepora intermedia	BROOK, 1893, p.31; pl.1, fig. C.
Acropora intermedia	CROSSLAND, 1952, p. 200; pl. 32, fig. 1.
	STEPHENSON & WELLS, 1956, p. 16.
	PILLAI, 1969 a, p. 414.
Acropora laevis	CROSSLAND, 1952, p. 230; pl. 45, figs. 1–2.

One specimen is a thick, stunted growth of this species. The usual arborescent growth has not taken place, probably a response to shallow-water habitat. The main stem is 3.5 cm in thickness. It bifurcates and each division carries short branchlets (1.5 to 2 cm). The axial corallites are 2.5 to 3 mm in diameter. On the main branches the radials are short, placed at right angles to the branch, not more than 1 mm long, thus resembling strongly CROSSLAND's (1952) figure of *A. grandis*. On the tip of branchlets they assume the normal shape and size. The septa are in two cycles in both the radial and axial corallites. Corallum solid.

This specimen has puzzeled us very much because of its smaller radials. However, it is very near to BMNH 86–11–22–10 (one of BROOK's syntypes) in its calicular characters. *A. laevis* is only a skeletal variation of *A. intermedia* and not a synonymy of *A. formosa* (PILLAI & STODDARDT, Ms. 2).

Material examined: X2: 67–6, Faro, Ari Atoll.

Distribution: Maldives; Southeast India; Great Barrier Reef.

Remarks: We have before us EHRENBERG's type of *Heteropora tylostoma* which Dr. KÜHLMANN has kindly sent to us from the Berlin Museum (No. 3178). As pointed by BROOK, it is the worn-out fragment of a thick-stemmed *Acropora* from Mauritius. The axial corallites are not retained and the radials are all corroded and no detail can be made out. We will probably never know what exactly EHRENBERG's species is. We could notice a far-fetched similarity between our specimen of *A. intermedia* and *H.tylostoma*. More collection from Mauritius may throw some light on their relationship. It is quite likely, that *H.tylostoma* is same as *A.intermedia*.

Acropora teres (VERRILL), 1866

(Plate 2, Figs. 2, 3)

Acropora teres	HOFFMEISTER, 1925, p. 58; pl. 10, figs. 1a, 1b, 2a, 2b; (synonymy).
	WELLS, 1954, p. 417; pl. 109, figs. 1–7.
	NEMENZO, 1967, p. 66.
	PILLAI & SCHEER, 1973, p. 468.

There are a few specimens in the present collection of this species. They are all parts of arborescent colonies. The longest branch is 34 cm long with a basal diameter of 9 mm at the broken lower end. The axial corallites in most of the specimens were damaged during the process of collection and transportation and only in one specimen they are preserved. The axials wherever preserved measure 2.5 mm in diameter with a large funnel-shaped opening having 12 septa. The prominent radials are labellate or nariform, confined to the upper parts of the branches. They are about 1 mm in diameter and 1 to 1.5 mm long. Outer wall spreading to 80 degrees; opening oblique. The septa vary in different calices. In some cases all the primaries are visible, though not conspicuous, while in others only the directives are visible. Towards the lower parts of the branches the radials become immersed or often the lower wall a little projecting. In subimmersed and immersed corallites only the directive septa are seen, the lower directive being the larger. Corallum solid in section.

Material examined: X2: 17–3 (a–c), X2: 18–22 (a–g), Inner reef, Hitaddu, Addu Atoll; X2: 48–3 (a–e), Northern reef flat, Bushy Islet, Addu Atoll.

Distribution: Maldives; Minicoy; China Sea; Philippines; Marshall Islands; Samoa.

Remarks: PILLAI (1971) has collected and observed large colonies of this species (up to 1.5 m high) from the lagoon of Minicoy Atoll and reported them under the name *A. pharaonis*.

Acropora pharaonis (MILNE EDWARDS & HAIME), 1860

(Plate 3, Figs. 1, 2)

Acropora pharaonis	MARENZELLER, 1906, p. 36; pls. 4–8, figs. 10–18; pl. 9, figs. 10a–17a; (synonymy).
	VAUGHAN, 1918, p. 166; pl. 69, figs. 1, 2, 3, 3a, 4, 4a, 5; pl. 70, figs. 1, 2, 2a.
	WELLS, 1950, p. 36.

A branch from an arborescent corallum probably belongs to this species. The proliferous corallites are distributed at a distance of 4 to 5 mm from each other. Between the proliferations there are subimmersed and shorter radial corallites.

Material examined: X2:72–1, Patch reef, Ari Atoll.

Distribution: Red Sea; Madagascar, Seychelles; Maldives; Cocos-Keeling Islands.

Acropora abrotanoides (LAMARCK), 1816

Madrepora abrotanoides	BROOK, 1893, p. 56 (synonymy).
Acropora abrotanoides	VAUGHAN, 1918, p. 166, pl. 68, figs. 1, 1a, 2.
	CROSSLAND, 1952, p. 204.
	WELLS, 1954, p. 418, pl. 123, figs. 1, 2.

Five specimens belong to this species. Four of them are parts of stout, semi-arborescent colonies. One is a complete corallum with several stems arising from a common base. The axial corallites vary from 3.5 to 4 mm in thickness in different specimens. The proliferous radials are 3 to 3.5 mm in diameter and 4 to 5 mm long. The radials of X2: 17–19 are ascending, while in others they are mostly spreading.

Material examined: X2:16–7, X2:17–9 and 17–19, Inner reef, Hitaddu, Addu Atoll; X2: 53–2, Patch reef, Addu Atoll; X2: 90–8, Outer reef; Weligandu, Rasdu Atoll.

Distribution: Maldives; Minicoy; Singapore; Murray Islands; Great Barrier Reef; Marshall Islands; ? Tahiti.

Acropora irregularis (BROOK), 1892

(Plate 4, Figs. 1, 2, 3)

Madrepora irregularis	BROOK, 1893, p. 50; pl. 14, figs. E, F.
Acropora irregularis	WELLS, 1950, p. 36; pl. 10, figs. 1, 2.

Twelve specimens are referred to this species. Large entire colonies observed in the field are semifunnel-shaped, about 1 m in height and diameter, bearing several palmate plates at the peripheral part. The tips of the plates bear usual branchlets which in turn undergo fusion. Free parts of the branches 3 to 5 cm long. The largest alciform plate in the collection is 16 cm long and 7 cm broad. X2: 17–18 is a young entire colony with an encrusting base sending up several slender branches. BROOK (1893) does not give the length of the radials, though WELLS (1950) states that his Cocos-Keeling specimens have radials measuring 4 to 8 mm in length and are similar to BROOK's type. In the present specimens the axials are 1.5 to 2 mm in diameter and are 2 to 3 mm exsert. The non-proliferous radials on the branchlets are mostly tubular and are 4 to 5 mm in length and 1.5 mm thick. A few are shorter and irregular in form. On the upper side of the plate a good many are immersed and the rest tubo-labellate, often placed at 45 degrees. In the axial corallites six primary septa are seen with a set of rudimentary secondaries. In the radials, generally the first cycle of septa is recognizable with varying numbers of secondaries.

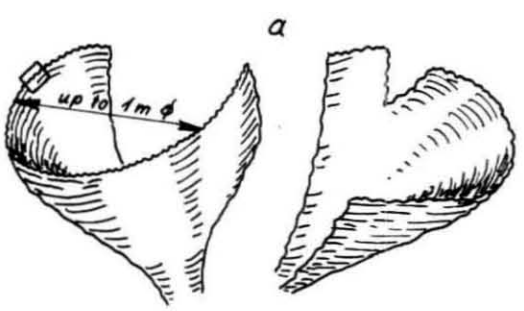
Material examined: X2: 17–8, 17–18 and 17–29, Inner reef, Hitaddu, Addu Atoll; X2: 58–1, Outer reef, Gan, Addu Atoll; X2: Sch–28, 29, 30, 31, 32, 33, 34 and 35, Xarifa Reef, Addu Atoll.

Distribution: Rodriguez; Seychelles (TAYLOR, 1968); Maldives; Cocos-Keeling Islands.

Remarks: The shape of the coralla shows distinct differences with the depth. In the deeper and more quiet water the semifunnel-shaped coralla have a diameter up to 1 m (Fig. 7a). Their upper margin is regularly high and little lobed

(Fig. 7b). In lower depths the coralla are more exposed to the movements of the water and are therefore smaller with diameters up to 0.5 m. Their margin is strongly lobed and irregularly splitted (Fig. 8).

An overturned coralla in a depth of about 8 m was still living (Fig. 9a). The horizontally placed margin has thickened and started to grow upwards (Fig. 9 b).



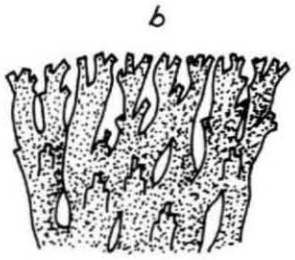


Fig. 7. Acropora irregularis.
a) Semifunnel-shaped big coralla with a diameter up to 1 m in a depth of about 10 m (zone 12).
b) Piece of the margin, showing its even form.

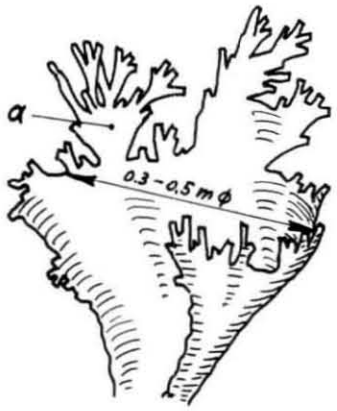


Fig. 8. Acropora irregularis. In shallow water in a depth of 2–3 m (e.g. zone 6) the coralla are smaller with a diameter up to 50 cm. The margin is irregularly splitted.
a) Piece of the margin, X2:Sch–35 (plate 4, fig. 1) of the present collection.

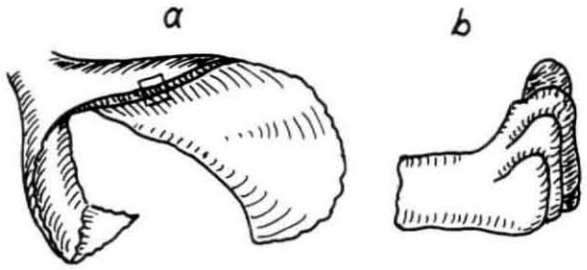


Fig. 9. Acropora irregularis.
a) An overturned coralla in a depth of 8 m (zone 12). The margin has thickened and begins to grow upwards.
b) Piece of the margin (X2:Sch–29 of the collection, plate 4, fig. 3), showing this growth.

Acropora efflorescens (DANA), 1846

(Plate 3, Fig. 3)

Madrepora efflorescens DANA, 1846, p. 441; pl. 33, fig. 6.
BROOK, 1893, p. 35; (synonymy).

Five specimens agreeing to DANA's figure and short description of this species are placed here. The corallum is vasiform, the branches fusing to form a solid plate. Under side flat with verruciform, immersed or rarely tubular corallites. The branchlets on the upper side, 8 to 10 mm long and 3 to 4 mm thick. Axial corallites 1 to 1.5 mm in diameter, 2 to 3 mm long. Radial corallites labellate, ascending, 2 to 3 mm long and 1 to 1.5 mm broad. There are 12 septa in the axial corallites. Radials have poorly developed septa, hardly any recognizable in many corallites. For further details of this species, based on specimens from the Minicoy Atoll, reference may be made to PILLAI (in press).

The distinguishing features of this species are the flabellate corallum with small upper branchlets (better called proliferous corallites) and prominent labellate, ascending radial corallites.

Material examined: X2: 17–26, Inner reef, Hitaddu, Addu Atoll; X2: Sch–43, 45 and 49, Xarifa Reef, Addu Atoll.

Distribution: Maldives; Minicoy; Singapore.

Acropora vasiformis (BROOK), 1893

(Plate 3, Fig. 4)

Madrepora vasiformis BROOK, 1893, p. 37; pl. 26, fig. A.

Three young, entire coralla are referred to this species. They all have solid plate-like corallum with narrow attachment area. The length of the specimens varies from 6 to 8.5 cm and breadth from 5 to 8 cm. The under sides of all the specimens are provided with tubular, subimmersed and immersed corallites. The tubular corallites are 3 to 3.5 mm long and 1 to 2 mm thick, a few are curved. The branchlets on the upper side of the plate are 1.5 cm long, 8 to 12 mm thick; their apices about 1 cm apart. Axial corallites cylindrical, 2 mm thick and exsert, wall solid. Primary septa well developed and meet at the middle of the axial fossa. Secondaries not seen. The radial corallites are both proliferous and non-proliferous. Non-proliferous corallites, tubular, nariform or labellate; spreading up to 80 degrees. The smaller ones are 1 mm in length and breadth. Primary septa fully developed, secondaries of varying numbers, but the cycle is not complete. Wall of the radials striated with serial echinulations.

Material examined: X2:67–7, X2:68–3, Faro, Addu Atoll; X2:81–7, Inner reef, Weligandu, Rasdu Atoll.

Distribution: Rodriguez; Maldives.

Remarks: The present specimens were carefully compared with BROOK's typeof the species kept in BMNH. In the nature of the axial and radial corallites there is no notable difference and the growth-form is fundamentally similar. The type is a large vasiform specimen, whereas the present specimens are only very young colonies. *A. orbicularis* is very near to *A. vasiformis*. But judging from the types it seems that *A. orbicularis* has thicker and larger radials mixed with numerous proliferations.

Acropora quelchi (BROOK), 1893

(Plate 4, Fig. 4)

Madrepora quelchi BROOK, 1893, p. 90; pl. 32, figs. D, E.
BEDOT, 1907, p. 256; pl. 41, figs. 225–234.

Acropora quelchi HOFFMEISTER, 1925, p. 66.
FAUSTINO, 1927, p. 265.
THIEL, 1932, p. 119; pl. 14, fig. 3.
CROSSLAND, 1952, p. 209; pl. 36, figs. 1–3.
STEPHENSON & WELLS 1956, p. 17.
NEMENZO, 1967, p. 117; pl. 32, fig. 4.

Two specimens belong to this species. X2: 58–3 is part of a corymbose corallum resembling THIEL's figure very much. The upper branchlets are 3 to 4 cm long and 5 to 6 mm thick. Axial corallites 2 to 2.5 mm in diameter, 2 to 3 mm exsert. Radial corallites ascending, up to 6 mm long, 2 to 2.5 mm in diameter. Towards the base of the branchlets many are immersed. A second specimen is from the peripheral part of a corallum. The main branches at the under side are a little flattened. The branchlets are only up to 2 cm long. The radial corallites are tubular and curved up as in BROOK's type housed in BMNH. Surface coenenchyme is closely echinulate in both the specimens.

Material examined: X2: 31–14, Wreck, Addu Atoll; X2: 58–3, Outer reef, Gan, Addu Atoll.

Distribution: Maldives: Philippines; Amboina; Great Barrier Reef; Solomon Islands; Samoa.

Remarks: This species was not previously known from the Indian Ocean.

Acropora stoddarti n.sp.

(Plate 5, Figs. 1, 2; Plate 6, Figs. 1, 2, 3)

The present species is based on four specimens. They show considerable individual variations among themselves. One of the specimens is described below in detail and the variations in others are indicated.

Corallum prostrate, main divisions flat at the under side, coalescent to form a flattened broad plate with occasional triangular or oval spaces. No branchlet at the under side. The growing edge of the corallum has prostrate, elongated branches with several branchlets. Under side possesses scattered immersed corallites. Upper side of the plate with widely spaced branches 3 to 7 cm long and 10 to 12 mm thick. They are curved with tapering apices, sometimes bearing two to three small branchlets. The following details of the corallites are based on X2:31–24.

Axial corallites 2.5 mm in diameter, conical, 2 to 3.5 mm exsert. Septa poorly developed, rarely the primaries are visible. Radial corallites at the upper side of the plate nariform or subimmersed, the former 1 to 1.5 mm in length and diameter. On the branchlets the radials are uniform in size, regularly nariform, a little compressed from side to side, not numerous, widely spaced; outer wall a little thickened and curved up; opening oval, plane of aperture at right angle to the long axis of the branches. Diameter of openings 1.5 mm. Length of the radials 4 to 4.5 mm, diameter 2 mm. There are no subimmersed or immersed corallites on the branches. Septa obsolete, in older calices two directives can be seen, younger calices look totally empty.

In the other specimens the radials present a different appearance. They are ascending and appressed with very small openings. This condition is brought out by the thickening of the branches by the deposition of coenenchyme in between the corallites. The wall of the radials in all the specimens closely echinulate, the echinulations being in the form of small plates. Surface of the corallum also echinulate. Corallum solid in section.

Material examined: (Syntypes) X2:31–24, Wreck, Addu Atoll; X2:56–1, 56–2, Lagoon, Addu Atoll; X2:57–3, Inner reef, Gan, Addu Atoll.

Remarks: *A. stoddarti* compares with none of the species known to us. The outstanding features of the present species are the flattened plate-like corallum with very few tapering upper branchlets; presence of uniform long radials with poorly developed septa and the formation of plate-like corallum by the expansion of rounded branches as the growth proceeds.

The present species is named in honour of Dr. D.R. STODDART, University of Cambridge, whose contributions to reef studies are well known.

Acropora reticulata (BROOK), 1892

(Plate 7, Fig. 1)

Madrepora reticulata	BROOK, 1893, p.68; pl.4, figs.A, B.
Acropora reticulata	WELLS, 1954, p.422; pl.110, figs. 4–6; pl.114, figs. 1–6.

One specimen is 14 cm in length and 6 cm in breadth. The main branches are slender and reticulate. The under side of the prostrate corallum is flattened with nariform radial corallites. Axial corallites are thin-walled with six small septa. In the radial corallites the septa are hardly visible. In details the present specimen agrees to var. *cuspidata*.

Material examined: X2:31–4, Wreck, Addu Atoll.

Distribution: Amirantes; Seychelles; Maldives; Minicoy; Macclesfield Bank; Tizard Bank, China Sea; Arafura Sea; Marshall Islands; Funafuti; Ellice Islands.

Acropora complanata (Brook), 1891

(Plate 7, Fig. 2)

Madrepora complanata	BROOK, 1893, p.70; pl.4, fig. C.
Acropora complanata	EGUCHI, 1938, p. 380.

Corallum flabellate, main branches flattened and reticulate. Peripheral branches prostrate confining to the general plane of growth. Thickness of main branches about 1 cm. Axial corallites 2 mm in diameter, tubular, about 1 mm exsert with six narrow septa. The under side has appressed, tubular and subimmersed corallites. The tubular ones are 1.5 to 1.75 mm in thickness and 2 to 3 mm long. The radial corallites on the upper side of the corallum are spreading, nariform and subimmersed. A few are tubular and proliferous. Larger radials 1.5 to 1.75 mm in diameter, about 2 mm long. Others smaller. The radials have poorly developed septa. In older calices the first cycle is visible but the laterals are spiniform. In younger corallites only the directives are present. Wall of the corallites striated and echinulate, corallum dense in section.

Material examined: X2:200–6, Outer reef, Malos, Ari Atoll.

Distribution: Seychelles; Maldives; Macclesfield Bank, China Sea; Palau Islands.

Remarks: In one of BROOK's types (BMNH 1882–10–17–148) the radial corallites are hooked at the tips and are narrower than at the base. The present specimen agrees more to BMNH 1882–10–17–147 than to other types of this species. The var. *informis* (BMNH 92-10-17-71) differs from the type in the absence of prominent radials at the under side.

Acropora hyacinthus (DANA), 1846

Acropora hyacinthus	HOFFMEISTER, 1925, p.64; pl. 13, fig. 3; pl. 14, figs. 1a–1d; (synonymy).
	WELLS, 1954, p. 421, pl.118, figs.3, 4, pl.120, figs. 3–5
	STEPHENSON & WELLS, 1956, p.15.
	NEMENZO, 1967, p.115; pl.33, fig.1.
	PILLAI & SCHEER, 1973, p. 468.

Six specimens are referred to this species. Two of them show the initial stage of growth of this species. The remaining specimens are parts of vasiform colonies. The entire material seems to be referable to var. *cytherea*.

Material examined: X2:17–4 and 17–5, Inner reef, Hitaddu, Addu Atoll; X2:Sch–26(a–c) and X2:45–4, Xarifa Reef, Addu Atoll; X2:97–29 and 97–30, Patch reef, Gaha Faro.

Distribution: Maldives; Minicoy (PILLAI, 1971); Southeast India; Ceylon; Andamans; Nicobars; China Sea; Singapore; Great Barrier Reef; Marshall Islands; Samoa; Cook Islands; Tahiti.

Acropora surculosa (DANA), 1846

Madrepora surculosa	BROOK, 1893, p.104 (synonymy).
Acropora surculosa	CROSSLAND, 1952, p.214; pl.38, figs. 2–5
	WELLS, 1954, p.421; pl.118, figs.1,2; pl.119, figs.1–3.
	STEPHENSON & WELLS, 1956, p.19.
	NEMENZO, 1967, p.98; pl.29, figs.1, 2.
Madrepora recumbens	BROOK, 1893, p.106; pl.27, fig. F.
Madrepora convexa	BROOK, 1893, p.118 (synonymy).

Five specimens are placed under this species. WELLS (1954) suggested that *A. convexa* is probably the same as *A. surculosa*. One of our specimens is an entire colony with a corymbose corallum. The central branches show corallites typical of *A. convexa*, while the peripheral branches have ascending corallites typical of *A. surculosa*. This specimen can be placed in either of the two species. Dr. KÜHLMANN of the Berlin Museum has sent us good photographs of EHRENBERG's type of *Heteropora millepora*. The growth-form of *A. surculosa* and *A. millepora* are mostly the same. The characters of the radials show no noteworthy variations. It is quite possible that many "species" considered by BROOK (1893) under his subgenus *Lepidocyathus* are only growth-forms and not genetically demarkated. For example, as listed by UMBGROVE (1940), *A. millepora, A. squamosa, A. prostrata, A. subulata, A. selago* and *A. surculosa* form a series and needs further study on the reef.

Material examined: X2:18–12, 18–13, Inner reef, Hitaddu, Addu Atoll; X2:Sch–40, 46, and 51, Xarifa Reef, Addu Atoll.

Distribution: Maldives; Gulf of Mannar (PILLAI, 1971b); Ceylon; Andamans (PILLAI, unpubl.); Mergui Archipelago; East Indies; Philippines; Great Barrier Reef; Marshall Islands; Fiji; Tahiti.

Acropora valida (DANA), 1846

(Plate 7, Figs. 3, 4)

Madrepora valida	DANA, 1846, p.461; pl.35, fig. 1.
	BROOK, 1893, p.168.
Acropora valida	HOFFMEISTER, 1925, p.60; pl.12, figs. 1 a–c.
	WELLS, 1954, p.429; pl.130, figs. 7–9.
	NEMENZO, 1967, p.99; pl.30, fig. 1.

There is only one specimen in the present collection which one of us (SCH.) could compare in the U.S. National Museum with DANA's type, with specimens collected by MAYOR and others described by WELLS (1954). In comparison with the type, our specimen is somewhat smaller in all parts, but otherwise there are no conspicuous differences.

The present specimen is only part of a cespitose colony. Several branches bearing branchlets arise from a common base. Peripheral branches prostrate, coalescent, a little flattened at the under side. The under side possesses large number of bursiform, nariform or subimmersed corallites. The branches are 12 to 15 mm in thickness at the base. Total height of corallum about 5 cm. Branchlets 2 to 2.5 cm long and 8 to 10 mm thick. Axial corallites tubular, 2 mm thick, 1.5 to 2 mm exsert, aperture about 0.6 to 0.7 mm in diameter. Wall rounded and echinulate. Six well developed septa, the directives

being larger; secondaries less developed. Prominent radial corallites tubular, spreading from 45 to 60 degrees. A few bear buds. Diameter 1.5 mm, length 3 to 4 mm. Inner wall less developed than the outer, opening oblique. A few radials are shorter and subimmersed. The prominent radials are confined to the upper parts of the branchlets, below getting verruciform and subimmersed. Septa in two cycles with very prominent directives. Wall of the radials with closely set fine echinulations. Corallum dense in section.

Material examined: X2:81–9, Inner reef, Weligandu, Rasdu Atoll.

Distribution: Maldives; Mergui Archipelago; Singapore; Torres Strait; Marshall Islands; Fiji Islands; Tonga Islands; Samoa.

Acropora digitifera (DANA), 1846

Acropora digitifera
VAUGHAN, 1918, p. 175, pl. 76, figs. 1, 1a, 2.
WELLS, 1954, p.427, pl.127, figs. 1,2.
STEPHENSON & WELLS, 1956, p. 13.
NEMENZO, 1967, p. 112.
PILLAI, 1969a, p. 415.

Three cespitose colonies agree to VAUGHAN's good description of this species. The radial corallites are spreading and labellate.

Material examined: X2:16–18, X2:18–9, Inner reef, Hitaddu, Addu Atoll; X2:Sch–25, Xarifa Reef, Addu Atoll.

Distribution: Madagascar; Seychelles; Maldives; Southeast India; Philippines; Great Barrier Reef; Marshall Islands.

Acropora forskali (EHRENBERG), 1834

(Plate 8, Figs. 1, 2)

Madrepora forskali
KLUNZINGER, 1879a, p.17; pl.3, fig. 6; pl.5, fig. 2; pl. 9, fig. 13.
BROOK, 1893, p.170.

Acropora forskali
MARENZELLER, 1906, p.51; pl.17, figs. 51, 52; pl.18, figs. 51a, 52.

Two specimens in the present collection have semi-arborescent coralla with several proliferations and branchlets. Axial corallites generally 3.5 mm in diameter, 1 to 2 mm exsert with large rounded openings. The non-proliferous radials are half-tubular, ascending, 2.5 to 3 mm thick, up to 3 mm long. A large number of smaller radials with subimmersed and verruciform ones are seen. The proliferous corallites resemble the axial corallites in details. The axial corallites have 12 septa, but the secondaries are very small. In several corallites the directives meet each other at the middle. The wall of the radials as well as the surface coenenchyme is echinulate. Corallum porous in section.

Material examined: X2:17–25, Inner reef, Hitaddu, Addu Atoll; X2:107–1, Inner reef, Kuludu, Miladummadulu Atoll.

Distribution: Red Sea; Persian Gulf; Maldives.

Remarks: This species is very near to *A. murrayensis* and *A. rosaria*, both of which are not known from Indian Ocean. Further studies on the relationship of them will be interesting, in spite of their difference in growth-form.

Acropora eurystoma (KLUNZINGER), 1879

(Plate 8, Fig. 3)

Madrepora eurystoma
KLUNZINGER, 1879a, p. 16; pl. 1, fig. 8; pl. 4, figs. 7a, 7b; pl. 9, fig. 12a–f.
BROOK, 1893, p.137.
PILLAI et al., 1973, p.458.

The following is a short description of the specimen with the register number X2:Sch 22.

Corallum corymbose with a narrow base of attachment. Greater diameters 11 and 10 cm. Under side with small proliferations. Surface with large subimmersed or immersed corallites. Branchlets 2 to 3 cm long, 6 to 8 mm thick. Axial corallites 3 mm in diameter, wall thick; openings about 1 mm in diameter; septa 12. Radial corallites ascending, inner wall less developed than the outer. A few are proliferous and tubular. Non-proliferous radials 3 to 4 mm long and 2 mm

thick, wall thin; openings large, rounded or oval. At the basal parts of the branchlets the radials become shorter and finally immersed. Immersed corallites 1 to 1.5 mm in diameter. The radials have generally six septa, the directives often fusing to the centre. Wall porous, striated with echinulations. Surface spongy, echinulate.

Another specimen (X2:17–6) has a cespitose corallum with very slender branches. The radial corallites are shorter than in Sch 22. This specimen resembles one of the BMNH specimens labelled variety *parvula* by BROOK.

Material examined: X2:17–6, Inner reef, Hitaddu, Addu Atoll; X2:Sch–22 and X2:45–2, Xarifa Reef, Addu Atoll.

Distribution: Red Sea; Seychelles; Diego Garcia; Maldives; Torres Strait.

Acropora variabilis (KLUNZINGER), 1879

Madrepora variabilis KLUNZINGER, 1879a, p.17; pl.1, fig. 10; pl.2, figs. 1, 5; pl.5, figs. 1, 3; pl.9, fig. 14.
For further literature see SCHEER & PILLAI (1974).

Two specimens are placed under this species. The axial corallites are only 2.5 mm in diameter and about 2 mm long. Radial corallites are half-tubular, 4 to 5.5 mm long and 2.5 mm in thickness. They are arranged in longitudinal rows along the long axis of the branches. Surface coenenchyme and the wall of the corallites closely echinulate.

Material examined: X2:Sch–23, Xarifa Reef, Addu Atoll; X2:43–5, Outer reef, Hitaddu, Addu Atoll.

Distribution: Red Sea eastward to Tuamotu Archipelago, but does not occur in the fringing reefs of Southeast India, though known from Ceylon. For specific geographic localities see SCHEER & PILLAI (1974).

Acropora elseyi (BROOK), 1892

(Plate 9, Fig. 1)

Madrepora elseyi BROOK, 1893, p.172; pl.11, figs. E, F.
Acropora elseyi CROSSLAND, 1952, p. 223.

Two cespito-arborescent coralla belong to this species. Total height 9 cm. Lower part is dead and covered over by calcareous algae. Main branches 1.5 cm thick, bearing several radiating branchlets. Branchlets 2 to 2.5 cm long, 8 to 10 mm thick with tapering tips. Axial corallites 3 mm in diameter, thick-walled, narrower at the tip than at the base. Opening rounded; septa 12. Radials are both proliferous and non-proliferous. Non-proliferous corallites crowded, ascending, tubular; inner wall less developed; outer a little thickened; diameter 1.5 to 2 mm, length 2 to 3 mm. A few smaller and subimmersed ones are found scattered among the prominent ones. Opening of the radial corallite oval or rounded with two cycles of septa. Surface echinulate. In the younger corallites the walls are a little porous but become dense in older ones.

Material examined: X2:45–1 and 45–5, Xarifa Reef, Addu Atoll.

Distribution: Thursday Island, Rocky Island, Great Barrier Reef.
The present record extends its distribution to Indian Ocean.

Remarks: The present specimens were compared with the types in BMNH and were found to tally with BMNH 1887-11-18-209 in every respect.

Acropora squarrosa (EHRENBERG), 1834

Heteropora squarrosa BROOK, 1893, p.65 (synonymy).
Acropora squarrosa VAUGHAN, 1918, p.184; pl.83, figs. 2, 2a, 2b.
WELLS, 1954, p.427; pl.129, figs. 1, 2.
NEMENZO, 1967, p.69; pl.21, fig. 4.

One cespitose corallum has a narrow base of attachment. The branches are 5 to 6 cm long, 10 to 12 mm thick, bearing branchlets. The tips of branches and branchlets are obtuse. Axial corallites 2.5 to 3 mm in diameter, very thick with rounded aperture. Radial corallites rounded, nariform, spreading up to 90 degrees. A good many are immersed, especially at the basal parts of the branches. A few corallites are proliferous. There are 12 septa in the axial corallites. In the radial corallites the primary cycle of septa is complete with a few of the secondaries. Surface coenenchyme reticulate and echinulate.

Material examined: X2:71–1, Mini-atoll, Ari Atoll.

Distribution: Red Sea; Seychelles; Maldives; Minicoy (PILLAI, 1971); Philippines; Murray Island; Marshall Islands; Tahiti.

Acropora concinna (BROOK), 1893

(Plate 9, Fig. 2)

Madrepora concinna — BROOK, 1893, p.165; pl.17.
(not) SEARLE, 1956, p.14; pl.6, fig. A.

Three cespitose specimens agree to BROOK's description of this species though there are slight individual variations. The axial corallites are 3 to 3.5 mm in thickness and 2 to 3 mm exsert. The radial corallites are unequal, or of different types. The prominent ones are both proliferous and non-proliferous tubulars. They are narrower at the distal than at the proximal ends. Basal diameter 3 to 3.5 mm, length up to 6 mm; spreading to 80 degrees. Numerous verruciform and subimmersed corallites are found mixed with the tubular ones. The under side of the corallum has subimmersed corallites. The axials as well as the radials have well developed primary cycle of septa with a few spiny secondaries. Wall striated and echinulate.

Material examined: X2:82–2, X2:83–1 and 83–5, Inner reef, Weligandu, Rasdu Atoll.

Distribution: Mauritius; Amirante Islands; Maldives.

Remarks: *A. concinna* is very near to *A. secale*, but differs in the angle of the radial corallites (see SCHEER & PILLAI, 1974). The specimen figured by SEARLE (1956) under the name *A. concinna* does not belong to this species.

Acropora humilis (DANA), 1846

Madrepora humilis — DANA, 1846, p.438, pl.31, fig. 4a–c; pl.41, figs. 4, 4a.
Acropora humilis — WELLS, 1954, p.425, pl.100, fig.1; pl.126, figs. 1–6; pl.127, figs.3, 4; pl.128, figs. 3–5; (synonymy).
STEPHENSON & WELLS, 1956, p.15.
SCHEER, 1967, p.424; figs. 4, 5.

The present collection includes 15 specimens of this species. The different coralla display individual variation, but all will fit in the revised description of the species given by WELLS (1954).

Material examined: X2:Sch-21, 24, 27 and 50, Xarifa Reef, Addu Atoll; X2:17–14, X2:18–19, Inner reef, Hitaddu, Addu Atoll; X2:34–7, 34–14, 34–15, Outer reef, Hitaddu, Addu Atoll; X2:81–3, 81–5, 81–8, 81–10, 81–11, and 81–13, Inner reef, Weligandu, Rasdu Atoll.

Distribution: Red Sea eastward to Tuamotu Archipelago. A wide-spread and common species.

Acropora eibli n.sp.

(Plate 10, Figs. 1, 2)

Description of the holotype:

Corallum prostrate, flabellate. Several main branches extending from a narrow base. (The holotype is only part of a corallum and has a main branch about 11 mm thick). Greater spread of colony 15 cm, length 14 cm. Branches flattened at the under side with occasional immersed calices (0.5 mm in diameter). However, the immersed corallites are not at all a conspicuous feature and are found only rarely. There are no projecting corallites at the under side. The main branch subdivides several times. Some of the branchlets grow transverse to the general plane of growth of the colony. Peripheral branchlets slender, 2 to 3 cm long, 3 mm in thickness. At the upper side of the corallum, in addition to the branchlets there are several vertical tubular corallites up to 10 mm long and 2 mm thick. They stand isolated and a few have radial corallites and grade towards branchlets. At the sides of the branchlets and branches these tubular corallites are placed horizontally. No coalescence of the branchlets. The upper side of the main branches have many verruciform and immersed corallites. Axial corallites 2 mm in diameter, so much exsert; opening small, oval, excentric so that the tip of the corallites appears beaked. Only the first cycle of septa is visible. The radial corallites are nariform, widely spaced, ascending, inner wall absent, outer wall thickened. Diameter of the radials 1.5 to 1.75 mm, length 1.5 to 2 mm. The radials have six septa but in the young radials only the directives are visible. To the naked eye the corallum looks

glabrous, but under a lens a closely packed echinulation is visible. The corallum is not striated but it is occasionally pitted. In section solid.

There is a second specimen (X2:41–6) in the collection. It is a young entire colony showing several branchlets arising from a common base. It has a greater spread of 5 cm. The details of the corallites are as in the holotype.

Material examined: X2:41–6, Patch reef, Addu Atoll; X2:88–2, lagoon bottom, Rasdu Atoll (holotype).

Distribution: Maldives; Minicoy.

Remarks: This species is fairly common in the lagoon of Minicoy Atoll and one of us (PILLAI, 1971, p.7) has collected several examples and reported them as *A. rambleri* before he studied the type of *rambleri* in BMNH. The earlier identification of these Minicoy specimens is wrong and they also belong to *A. eibli.*

The present species is named after Professor Dr. IRENÄUS EIBL-EIBESFELDT, who was a member of the two "Xarifa" Expeditions.

Acropora echinata (DANA), 1846

(Plate 11, Figs. 1, 2)

Madrepora echinata	BROOK, 1893, p.185 (synonymy).
Acropora echinata	VAUGHAN, 1907, p.158; pls.49, 50; pl.51, fig.1.
	FAUSTINO, 1927, p.278; pl.92.
	WELLS, 1954, p.423; pl.135, figs. 1–4; pl.136, figs. 1–6.
	PILLAI, 1969a, p.416.

X2:85–3 is an arborescent colony with a narrow base of attachment from where two main stems arise. The stems in their turn subdivide and bear many ramiculi. X2:87–1 is also arborescent, seems to have had a prostrate position in the natural habitat recalling the habit of *A. procumbens.* The radial corallites are mostly curved, 1 to 1.25 mm in diameter at the tip, slightly broader at the base, length up to 11 mm. A few are nariform. On the main branches majority is immersed.

A. procumbens is a closely related species and probably both are one and same. The major difference from *A. echinata* is its prostrate corallum as against the erect corallum of *A. echinata.*

Material examined: X2:85–3, Inner reef, Weligandu, Rasdu Atoll; X2:87–1, Outer reef, Weligandu, Rasdu Atoll.

Distribution: Maldives; Minicoy; Philippines; Great Barrier Reef; Marshall Islands; Solomon Islands (PILLAI & STODDART, Ms 2); Fiji; Samoa; Hawaii.

Acropora palifera (LAMARCK), 1816

Madrepora palifera	BROOK, 1893, p.131 (synonymy).

For further synonymy and literature see SCHEER & PILLAI (1974).

Four heavy specimens in the present collection represent this species. A detailed description is not necessarry as they show no noteworthy variation.

Material examined: X2:17–24, 17–27, 17–28(1), Inner reef, Hitaddu, Addu Atoll; X2:48–2, Northern reef flat, Bushy Islet, Addu Atoll.

Distribution: Western Indian Ocean eastward to Samoa. For specific localities see SCHEER & PILLAI (1974).

Genus *Astreopora* DE BLAINVILLE, 1830

The genus *Astreopora* is badly in need of a revision. BERNARD (1896) gave undue emphasis on the growth-form as specific criteria. It is a highly variable genus and careful studies of large suit of specimens will certainly reduce the number of species recognized by BERNARD. The second "Xarifa" Expedition collected 8 specimens from the Maldivian waters which we place under four species. They have been compared with the respective types when available in BMNH.

Astreopora myriophthalma (LAMARCK), 1816

Astraeopora myriophthalma	BERNARD, 1896, p.87; pls.25, 26; pl.38, fig. 9; (synonymy).
	CROSSLAND, 1952, p.180.
	NEMENZO, 1964, p.220; pl.11, fig.3.
Astreopora myriophthalma	VAUGHAN, 1918, p.146; pl.60, figs. 5, 5a.
	YABE & SUGIYAMA, 1941, p.83; pl.89, figs. 2–2c; pl.92, figs.1–2a.
	WELLS, 1950, p.40.
	WELLS, 1954, p.431; pl.141, figs. 3–6.

WELLS (1954) refers *A. elliptica* YABE & SUGIYAMA, 1941, and *A. tayamai* YABE & SUGIYAMA, 1941, to the synonymy of this species. He also discusses the skeletal variation displayed by *A. myriophthalma* at Marshall Islands. The present specimen is part of an explanate cushion-shaped corallum. An epitheca is visible at the growing edge. The corallites are exsert to 2 mm only and are 1.5 to 1.75 mm in diameter, average 3 mm apart. The tertiary cycle of septa is rudimentary. All three cycles of septa very narrow at the top of the wall. Primary septa reach the centre of the calicular fossa but do not fuse each other. The corallites are swollen at the basal part. Smaller and younger corallites are only slightly elevated. Surface covered with hirsute spines; wall with almost continuous costae.

Material examined: X2:Sch–11, Xarifa Reef, Addu Atoll;

Distribution: Red Sea eastward to Fanning Island.

Astreopora listeri BERNARD, 1896

Astraeopora listeri	BERNARD, 1896, p.91; pl.28; pl.29; pl.33, fig.12.
	NEMENZO, 1964, p.218; pl.11, fig.1.
Astreopora listeri	WELLS, 1954, p.432; pl.141, figs. 1,2.

Four pulvinate coralla are referred to this species. The lower layers are dead being overgrown by fresh layers. The calices are generally 2 mm in diameter, closely placed with smaller and younger ones in between. The third cycle of septa is rarely seen. The primaries meet at the centre of the fossa.

Material examined: X2:50–5, 50–13 and 50–15, Northern Reef flat, Addu Atoll; X2:90–12, Outer reef, Weligandu, Rasdu Atoll.

Distribution: Maldives; Nicobars; Philippines; Marshall Islands; Tongatabu; Cook Islands (STODDART & PILLAI, 1973).

Astreopora ocellata BERNARD, 1896

Astraeopora ocellata	BERNARD, 1896, p.95; pl.29; pl.33, fig.16.
Astreopora ocellata	VAUGHAN, 1918, p.147 (synonymy).
	MAYER, 1918, pl.17, figs. 36, 37.
	YABE & SUGIYAMA, 1941, p.83; pl.88, figs. 1–2b.
	WELLS, 1954, p. 432; pl.140, figs. 5, 6.
Astraeopora ovalis and *Astraeopora kenti*	BERNARD, 1896, pp. 97–98; pl.30; pl.33, figs. 17, 19.

Two specimens in the present collection show slightly smaller calices than in BERNARD's type (BMNH 1892-12-1-50). One of the specimens (X2:20–16) is encrusting over a dead Faviid completely covering the substratum thus looking solid. X2:100–4 is a thick cushion-shaped growth. In both the specimens the calices are generally 2 mm in diameter, projecting up to 4 mm, 3 to 5 mm apart. A few smaller ones are found in between. Septa very narrow at the wall, in two cycles. Primary septa meet at the centre of the calyx. Surface with secondarily frosted echinulations.

Material examined: X2:20–16, Inner reef, Abuhera, Addu Atoll; X2:100–4, Inner reef, Madewaru, Fadiffolu Atoll.

Distribution: Maldives; Northwest Australia; Palau Islands; Caroline Islands; Marshall Islands.

Astreopora gracilis BERNARD, 1896

Astraeopora gracilis	BERNARD, 1896, p.93; pl.29; pl.33, fig. 14.
Astreopora gracilis	YABE & SUGIYAMA, 1941, p.83; pl.88, figs. 3–4c; pl.92, figs. 3–3a.
	WELLS, 1954, p.432; pl.141, figs. 7, 8.

One pulvinate corallum (with three layers) agrees to BERNARD's type (BMNH 1884-11-22-32) from the Solomon Islands, except for the fact that the present specimen has calices 1.5 mm in diameter. Adult and full grown calices elevated, cylindrical with valleys in between. Two cycles of septa with a rudimentary set of tertiaries of varying numbers. The calicinal fossa is a dark, deep pit, the septa being visible only at close examination. The primary septa are very broad at the bottom of the fossa. The surface echinulations are thicker and rougher on the corallite walls than at the valleys.

Material examined: X2:57–5, Inner reef, Gan, Addu Atoll.

Distribution: Maldives; Ryukyu Islands; Marshall Islands; Solomon Islands.

Genus *Montipora* QUOY & GAIMARD, in DE BLAINVILLE, 1830

α) Papillate species of *Montipora:*

Montipora danae MILNE EDWARDS & HAIME, 1851

Montipora danae — BERNARD, 1897, p.101; pl.20; (synonymy).
WELLS, 1954, p.438; pl.147, figs. 1,2.
NEMENZO, 1967, p.38; pl.12, fig.3.

One entire colony in the collection belongs to this species. It is foliaceous, reniform, attached at one edge. The growing edge is 4 mm thick while the attachment area is 8 mm thick. The under side shows a thick epitheca with scattered calices, wherever it is free from the epitheca. The calices at the upper side about 0.6 mm in diameter, closely placed or wide apart. Septa in two cycles; primaries broad, 4 to 6 meet at the centre of the calyx. The papillae are large, rounded, elongated or crescent-shaped, sometimes fusing to form excrescences. They look smooth to the naked eye, but under a lens reveal a close reticulum. Individual papilla 3 to 4 mm broad and high.

Material examined: X2:29–1, Xarifa Reef, Addu Atoll.

WELLS & DAVIES (1966) have recorded this species from Gan, Addu Atoll, from a depth of 90 feet.

Distribution: Maldives; Macclesfield Bank (China Sea); Philippines; Port Denison (Australia); Marshall Islands. The type locality is unknown.

Montipora sinensis BERNARD, 1897

Montipora sinensis — BERNARD, 1897, p. 109; pl.19, fig.3; pl.33, fig.11.

Corallum encrusting, the lower layer dead and overgrown by fresh growth. The edges are not free. Living layer 2 to 4 mm thick. Calices conspicuous, deep punctured, about 0.7 mm in diameter, a diameter to 1 mm apart. Septa 12, well developed, the directives larger, a little exsert. Papillae very small, resemble tubercles, 1 to 1.5 mm high, 0.5 to 0.75 mm thick, they do not fully occupy the intercalicinal area. Many calices are without corresponding papilla. Surface with irregular nodules bearing calices and papillae. Surface coenenchyme solid, echinulate and reticulate.

Material examined: X2:83–9, Inner reef, Weligandu, Rasdu Atoll.

Distribution: Maldives; Tizard Bank (China Sea); Great Barrier Reef.

Remarks: *M. sinensis* is very near to *M. tuberculosa.* According to BERNARD (1897) they differ mostly in the size of the calices and degree of development of septa. HOFFMEISTER (1925) has also pointed out their differences and has described specimen showing characters intermediate between the two. The present specimen was compared with BERNARD's type housed in BMNH.

Montipora sinuosa n.sp.

(Plate 12, Figs. 1–5)

Description of the holotype: Corallum – complete form unknown – foliaceous, fan-shaped, mostly free, attached only by a narrow base. It has a greater diameter of 11 cm and a length of 8 cm; thickness at the growing edge 3 mm, at the middle part 6 mm. Under side looks smooth to the naked eye. No epitheca visible. Calices at the under side very minute, less than 0.5 mm in diameter, flush with the surface, 1 to 2 mm apart. Under the lens the under side reveals a fine reticulum resembling some *Turbinaria,* the meshes bearing fine echinulations.

Calices at the upper side about 0.5 mm in diameter, 1 to 2 mm apart, shallow, not conspicuous. Septa six, poorly developed, the directives a little prominent. Younger calices without any septa. The coenenchyme in section shows a middle reticulum, the meshes of which turn both upwards and downwards. At the surface the coenenchyme swells up into long zig-zag ridges extending from the base to the growing edge of the corallum, though at the peripheral part of the corallum they are very low. Individual conical or mammiform papillae are totally absent. The ridges are 4 to 6 mm high and 2 to 4 mm thick. Distance between top to top of adjacent ridges 3 to 4 mm. At the growing edges of the corallum to about 2,5 cm from the extreme edge they are not more than 1 mm high. The calices are arranged in longitudinal rows in the valleys. One or rarely two rows of calices can be seen within a valley. The calices are also arranged in longitudinal rows at the sides of the ridges. The coral is very light and highly porous, surface reticulate. Washed and dried corallum is yellow in colour.

Material examined: X2:110–1 (holotype), Inner reef, Bodu Mandu, Miladummadulu Atoll.

Remarks: The present species is unique in the genus in having highly elevated longitudinal, zig-zag ridges formed by the fusion of papillae with longitudinally arranged small calices both on the ridges and in the valleys. *M.pulcherrima* BERNARD and *M.sulcata* CROSSLAND, 1952, possess such longitudinal ridges. *M. pulcherrima* has smaller calices (0.25 mm) raised above the surface as small cylinders with thick primary cycle of septa. Further, the under side has several pendent knobs. Above all, the ridges are lower than in *M. sinuosa* and a comparison of the type of *M. pulcherrima* in BMNH with that of the present shows no similarities. *M. sulcata* agrees to *M. sinuosa* in growth-form, small flush calices and in the formation of ridges and minute details of coenenchymal nature. In *M. sulcata* the ridges are shorter and the calices are confined only in the valleys and not on the ridges as in the present. A notable difference is the presence of small tubercle-like papillae in *M. sulcata,* which are totally absent in *M. sinuosa. M. sinuosa* is characterized by: 1) Foliaceous corallum with a narrow attachment area, 2) absence of epitheca (this is not a reliable specific character in any coral), 3) smooth level under side without any protuberances, 4) small calices, 0.5 mm, with poorly developed septa, 5) absence of single papillae, 6) Presence of large zig-zag ridges almost extending to the growing edges.

Montipora sp.cf. *floweri* WELLS, 1954

(Plate 13, Figs. 1–3)

Montipora floweri WELLS, 1954, p.437; pl.147, figs. 4,7,8.

There are two encrusting specimens of *Montipora* in the present collection which come nearer to this species than to any other described so far. The following is a short description. Encrusting with free edges. Thickness at the broken central part 7 to 8 mm. Calices 0.5 to 0.6 mm in diameter, 1 to 2 mm apart, looking like deep punctures. A well developed thecal wall absent. Under side wherever free has small calices. Septa in two cycles. Primaries larger, almost reaching the centre. One to three of them seem to be exsert. Secondary septa reach to half the length of the primaries.

The corallum at its periphery is almost glabrous. Rarely one or two calices are lifted up by the formation of a ring around them by the surrounding coenenchyme. At the older part of the corallum regular papillae appear. Papillae scattered, many calices without them. They look like hoods over the calyx, rarely one or two fuse each other. WELLS (1954) does not give the measurements of the papillae. In the present specimens they are about 1 mm in height and thickness. The papillae when present at the periphery of the corallum "tend to be behind the calices facing the margins". Surface looks spiny.

Material examined: X2:18–17 and 18–24, Inner reef, Hitaddu, Addu Atoll.

Distribution: Maldives; Marshall Islands.

Remarks: The present record is the first for the species from the Indian Ocean.

Montipora prolifera BRÜGGEMANN, 1879

(Plate 13, Figs. 4, 5)

Montipora prolifera BERNARD, 1897, p.93; pl.18; (synonymy).
CROSSLAND, 1952, p.190.
NEMENZO, 1967, p.40; pl.13, fig.2.

We are referring 8 specimens to this species. In general characters they agree to BMNH 1878-7-26-1 (type of the species). Four of our specimens are encrusting on calcareous algae or other dead corals. They are all from

shallow-waters. In these specimens the papillae are well developed, 1 to 2 mm high and about 1 mm thick. At the periphery of the corallum they run together to form ridges. None of the papillae grades towards tubercle. A fifth specimen (X2:101–2) is a young foliate growth, the under side with an encrusting bryozoa. The papillae unite to form ridges, individual ones being rare. The rest of the specimens are part of large foliate growth similar to *M. foliosa*. They are 4 to 6 mm thick. The largest (X2:84–1) is 22 cm broad and 15 cm in length. The growing edges curve upwards. An epitheca is visible. The papillae at the central part of the corallum are tubercle-like, some of them forming incomplete rings around the calices. At the peripheral part of the corallum the papillae unite to form ridges 4 to 5 cm in length. In all the specimens the calicular wall is well cut out from the surrounding coenenchyme. The primary cycle of septa is well developed and extends to the centre of the calyx. Secondaries of varying numbers, sometimes the cycle is complete.

Material examined: X2:Sch-16 and 20, X2:29–6, 29–11, Xarifa Reef, Addu Atoll; X2:84–1, Inner reef, Weligandu, Rasdu Atoll; X2:101–2, X2:104–4 and 104–6, Inner reef, Madewaru, Fadiffolu Atoll.

Distribution: Maldives; Great Barrier Reef; Philippines; Ponape, Caroline Islands.

Remarks: This species was not previously known from the Indian Ocean.

β) Tuberculate *Montipora:*

Montipora informis BERNARD, 1897

Montipora informis

BERNARD, 1897, p.133; pl.27, fig.3; pl.34, fig.3.
VAUGHAN, 1918, p.156; pl.64, figs. 3,4,4a,4b,4c; pl.65, figs.1,1a.
CROSSLAND, 1952, p.195.
STEPHENSON & WELLS, 1956, p.22.
PILLAI, 1969a, p.421.

We refer three specimens to this species. Two of them are basal encrustations, while the third is an irregular nodular growth 5 cm in thickness and 5.5 cm in height. The calicular and coenenchymal characters are similar to the one described by BERNARD.

Material examined: X2:53–1, X2:55–2, Patch reefs, Addu Atoll; X2:100–10, Inner reef, Madewaru, Fadiffolu Atoll.

Distribution: Maldives; Gulf of Mannar and Palk Bay along the Indian coast; Cocos-Keeling Islands; North Celebes; Great Barrier Reef; New Caledonia (CHEVALIER, 1968).

Montipora suvadivae n.sp.
(Plate 14, Figs. 1–4)

Description of the holotype: Corallum an attached foliaceous lamina. Greater diameter 9 cm. Thickness at the growing edge 1.5 mm, at the basal part 6 mm. Under side at the basal part dead with the living layer extending to 3 cm from the growing tip. Epitheca in patches. Calices at the under side small, scattered, raised on conical elevations, opening 0.25 mm with two cycles of septa. The coenenchyme shows closely packed granules, some of them expand to form plates.

The upper side displays a very rough appearance with occasional swellings mainly due to attached barnacles. Calices are of two kinds, level and projecting. The level calices are 0.4 mm in diameter and 1 to 1.5 mm apart with a thin wall. Septa 12, primaries subequal and almost extent to the centre but generally do not fuse each other. Secondaries as half the length of the primaries. Scattered all over the corallum there are many projecting corallites resembling some species of *Turbinaria*. The elevations are 2 to 2.5 mm high and 2 to 3 mm thick (mostly 2 mm), either close together or 2 to 3 mm apart. The level calices are found mixed among them. The calyx at the tip of the conical elevation is similar to size and structure to that of the level ones.

Section shows a lower thin and upper thick trabecular layer. The surface is spiny. The tubercles are very small, arranged close together, individual ones 0.2 to 0.3 mm in thickness and height. The tips of the tubercles are rounded. The calicles bearing elevations are also closely packed with tubercles. Close to the calicular wall there are 8 tubercles but they stand a little away from the top of the wall so that the latter is clear when looked from above. Between the tubercles the coenenchyme shows minute pores.

Material examined: X2:63–1 (holotype), Fulu, Suvadiva Atoll.

Remarks: The possession of both level and projecting corallites (the latter not by the fusion of the tubercles but by the actual elevation of coenenchyme) is the most distinguishing feature of this species. We do not know any earlier species showing these characters.

Montipora maldivensis n.sp.
(Plate 15, Figs. 1–3)

Description of the holotype: Corallum semicircular, thick, heavy disc attached at one edge. Growing edge 1 cm thick, the broken attachment area 3 cm thick. Part of the upper side is dead, over which fresh growth takes place. A thick epitheca is visible at the under side, that stops about 5 mm from the extreme tip. There is no calyx at the under side. Greater diameter of the corallum 24 cm, length 15 cm.

Calices at the upper side 0.6 to 0.7 mm in diameter, superficial, a diameter to 2 mm apart; well cut out from the surrounding coenenchyme. There are 12 well developed septa, the primaries reach to almost the centre and the directives often fuse each other over a columella-like structure. Septa crowded, filling the fossa. Section of the coral shows a lower solid reticulum with an upper porous layer. The tubercles are small, 0.3 mm in thickness and 0.5 mm in height, uniformly distributed in the intercalicinal area. Around the calyx there are 6 to 8 tubercles closely placed to the wall. Very rarely they undergo fusion to carry the calicinal fossa upwards.

A second specimen which we designate as the paratype is 12 × 12 cm in length and breadth. The upper surface possesses several small lobulations as in the type, probably a response to intruding barnacles.

Material examined: X2:101–4 (holotype), X2:104–7 (paratype), Inner reef, Madewaru, Fadiffolu Atoll.

Remarks: The growth-form of the present new species is very remarkable. We could not find anything approaching to *M. maldivensis* among the collection of the BMNH. Neither MARENZELLER (1906), VAUGHAN (1907, 1918), HOFFMEISTER (1925), UMBGROVE (1939, 1940), THIEL (1932), WELLS (1950, 1954), CROSSLAND (1952) nor NEMENZO (1967) describe any specimen resembling *M. maldivensis*.

2. Suborder Fungiina VERRILL, 1865
Superfamily Agariciicae GRAY, 1847
a) Family **Agariciidae** GRAY, 1847

Genus *Pavona* LAMARCK, 1801

Pavona duerdeni VAUGHAN, 1907

Pavona duerdeni VAUGHAN, 1907, p.135; pl.38, figs. 2,2a,3.

We have discussed elsewhere (SCHEER & PILLAI, 1974) the relationship of *P. duerdeni, P. clavus* and *P. maldivensis*, all the three we regard separate. The present specimen shows not much difference from the one we have described from the Nicobar Islands in calicular characters.

Material examined: X2:100–16, Inner reef, Madewaru, Fadiffolu Atoll.

Distribution: Abd-el-Kuri; Seychelles; Maldives; Laccadives; Nicobar Islands; Strait of Malacca (PILLAI & SCHEER, 1974); Great Barrier Reef; Daito Islands; Caroline Islands; Marshall Islands; Hawaii.

Pavona maldivensis (GARDINER), 1905
(Plate 17, Fig. 1)

Siderastrea maldivensis GARDINER, 1905, p.935; pl.89, figs. 1–3.

Two large columnar specimens are referred to this species. They agree in details to GARDINER's description which needs no repetition. Further in a recent paper we (SCHEER & PILLAI, 1974) have described specimens from the Nicobar Islands. However, we give here a figure of one of the present specimens to illustrate the growth-form of this species.

Material examined: X2:93–1, Channel, Weligandu, Rasdu Atoll; X2:104–2, Inner reef, Madewaru, Fadiffolu Atoll.

Distribution: Chagos; Maldives; Gulf of Mannar; Nicobars.

Pavona explanulata (LAMARCK), 1816
(Plate 16, Fig. 3)

Lophoseris explanulata	MILNE EDWARDS (& HAIME), 1860, p.69; pl. D 11, fig.2; (synonymy).
	ORTMANN, 1889, p.514.
Pavonia explanulata	KLUNZINGER, 1879 b, p.74; pl.9, fig.8.
	RIDLEY, 1883, p.259.
Pavona explanulata	HORST, 1922a, p.418; pl.31, fig.9.

Corallum explanate, attached, growing edges free. Maximum thickness 15 mm, edges only 1 mm. Calices 3 to 4 mm in diameter. Depth of calices 1 to 2 mm. Ambulacra flat, 1 to 2 mm thick. Septa around a calyx 22 to 26; alternating in height and thickness, major ones reach the columella. Edges of septa serrated, sides granular. Septo-costae confluent from centre to centre. Columella elongated. One of the present specimens is a nodular mass exactly resembling the one figured by KLUNZINGER.

Material examined: X2:100–3, X2:105–1 and 105–3, Inner reef, Madewaru, Fadiffolu Atoll.

Distribution: Red Sea; Chagos; Maldives; Ceylon; Andamans; Cocos-Island (DURHAM & BARNARD, 1952).

Pavona yabei n. sp.
(Plate 16, Figs. 1, 2)

Description of the holotype: Corallum foliaceous, unifacial, attached by a narrow base at one edge. It is partly broken. Total length 16.5 cm, greater width 12 cm. The growing edge is only 1 mm thick, getting to 7 mm at the area of attachment. The under side is with rounded ridges and furrows resembling some specimens of *Merulina ampliata*. The ridges have very thin costae that are visible only under a lens. To the naked eye the under side looks smooth.

On the upper side (calicinal side) there are a number of lengthy ridges (collines) extending from base to the growing edge of the corallum. The longer uninterrupted ones are up to 9 cm long. Height of ridges 2 to 3 mm, thickness at the top 1 mm, at the base 2 to 3 mm. The longitudinal ridges are connected by transverse ridges similar in structure to longitudinal ones. These longitudinal and transverse placements of the ridges are found throughout the corallum. Distance between top to top of ridges 5 to 10 mm. The calices are arranged in parallels to the transverse ridges, i. e. transverse to the longitudinal ridges. Between two transverse rows of ridges usually there is only one row of calices, each row with 2 to 4 calices. The adjacent calices within a row are not separated by elevated walls, so that they sometimes run together. Distance between columella centres within a row 2 to 2.5 mm. Distance between adjacent rows 5 to 8 mm. There are 40 to 60 septa around a calyx, alternating in size, but the distinction between major and minor is very slight. The septo-costae of the calices at either end of a row continue over both the longitudinal and transverse ridges, i. e. part of the septo-costae cross over the former and the rest over the latter, to meet over the columellae of the opposite sides. The septo-costae of the calices placed at the mid portion of the rows are continuous only over the transverse ridges on either side. Adjacent calices within a row often linked by one or two lamellae. Septal sides granular, edges entire. Axial fossa about 1 mm in diameter. Columella lamellar, elongated in the direction of the long axis of the calyx. Sometimes the calicular bottom is solid without any columella.

The corallum is partly folded downwards at one edge and was growing below the main folia. The longitudinal and transverse ridges are not developed. The proximal wall of the corallites are a little bulged up as in *Leptoseris*. It is quite different in appearance from the normal growth of this species and this piece alone when examined in the absence of the major folia will be tempting to an identification with *Leptoseris*.

Material examined: X2:97–2, Patch reef, Gaha Faro (Holotype).

Remarks: *P. yabei* sp.nov. is quite striking by virtue of its longitudinal and transverse ridges compartmentalising short rows of calices. The septal number is comparatively very high for its small calices. We are unable to compare the present species with any earlier described ones. It is named after the late Professor HISAKATSU YABE, whose death occurred on June 23rd, 1969, and whose works on the taxonomy of corals are very well known.

Pavona varians VERRILL, 1864.

Pavona varians	HORST, 1921, p. 25 (synonymy).
	YABE, SUGIYAMA & EGUCHI, 1936, p. 57, pl. 58, fig. 6.
	UMBGROVE, 1939, p. 47.
	UMBGROVE, 1940, p. 298.
	CROSSLAND, 1952, p. 162; pl. 13, figs. 1, 2; pl. 14 fig. 4.
	WELLS, 1954, p. 442; pl. 152, figs. 3, 4.
	NEMENZO, 1955, p. 16; pl. 2, fig. 3.

Material examined: X2:18–6 and 18–7, Inner reef, Hitaddu, Addu Atoll; X2:20–10, Inner reef, Abuhera, Addu Atoll; X2:29–8 and X2:35–6, Xarifa Reef, Addu Atoll; X2:41–3, Patch reef, Addu Atoll; X2:50–3, Northern reef flat, Addu Atoll; X2:90–29, Outer reef, Weligandu, Rasdu Atoll; X2:100–7, 100–13, 100–14, 100–19 and X2:104–5, Inner reef, Madewaru, Fadiffolu Atoll.

Distribution: Red Sea eastwards to Hawaii and Cocos Island (DURHAM, 1962). DURHAM & BARNARD (1952) have recorded this species from Columbia.

Pavona (Pseudocolumnastraea) pollicata WELLS, 1954

(Plate 15, Fig. 4)

Pavona maldivensis	(non GARDINER) MATTHAI, 1948, p. 182; pl. 6, fig. 20; fig. 47.
Pavona (Pseudocolumnastraea) pollicata	WELLS, 1954, p. 443; pl. 53, figs. 1–3.

Two columnar specimens perfectly agree to WELLS' description of this species. The taller corallum is 4 cm in height. In both the colonies the columns subdivide. The corallites are projecting.

Material examined: X2:Sch-19, Xarifa Reef, Addu Atoll; X2:100–12, Inner reef, Madewaru, Fadiffolu Atoll.

Distribution: Maldives; Marshall Islands; Tahiti; Tuamotu Archipelago.

Remarks: This seems to be the first record of this species from the Indian Ocean. MATTHAI (1948) considered this only as a skeletal variation of *P. maldivensis* (MATTHAI's specimen is in the Zoology Museum of Cambridge University at Downing Place). However, more specimens are required to ascertain the relationship between these two species.

Genus *Leptoseris* MILNE EDWARDS & HAIME, 1849

Leptoseris gardineri HORST, 1921

Leptoseris papyracea	(non DANA) GARDINER, 1905, p. 947; pl. 92, fig. 23.
Leptoseris gardineri	HORST, 1921, p. 30.
	HOFFMEISTER, 1925, p. 42; pl. 4, fig. 2.
	YABE, SUGIYAMA & EGUCHI, 1936, p. 59; pl. 30, fig. 6.
	WELLS, 1954, p. 443.

Three specimens in the present collection agree to GARDINER's (1905) good description of this species. They all have branched thin coralla. The corallites are 7 to 10 mm apart, the lower wall rounded and elevated. The septo-costae extend to the growing edge and give a fine serrated appearance to the corallum at the folia. The septo-costae are alternating in size and are non-toothed.

Material Examined: 88–13, 88–14 and 88–29, Lagoon, Weligandu, Rasdu Atoll.

Distribution: Maldives; Java; Amboina; Great Barrier Reef; Marshall Islands; Fiji; Samoa.

Leptoseris scabra VAUGHAN, 1907

(Plate 17, Fig. 4)

Leptoseris scabra	VAUGHAN, 1907, p. 139; pl. 41, figs. 1, 1a, 2.
	HORST, 1922a, p. 421.
	HOFFMEISTER, 1925, p. 43.
	WELLS, 1954, p. 444; pl. 155, figs. 1, 2.

We refer five specimens to this species. Four of them are saucer-shaped with broad attachment and a fifth (X2:76–4) is encrusting. The growing edge is not more than 1mm in thickness. A central calyx is visible. The secondary calices are arranged in irregular concentric rows. The proximal part of the corallite wall is mostly elevated and in some specimens run together forming a ridge, and in such cases the adjacent corallites in a row are not separated by elevated wall in between. At the under side the costae are feebly developed and are visible only under a lens. At the swollen wall the septo-costae are excessively thickened and wavy.

Material examined: X2:76–4, 76–6, 76–7, Great Faro, Ari Atoll; X2:88–9 and 88–46, Lagoon, Weligandu, Rasdu Atoll.

Distribution: Amirante Isles; Cargados-Carajos; Maldives; Marshall Islands; Samoa; Hawaii.

Remarks: *L.scabra* is very near to *L. hawaiiensis* VAUGHAN, 1907, and their differences are only slight and comparative. It is quite possible that they are only one and the same. The present specimens agree with one specimen in BMNH, labelled *L. scabra* by VAN DER HORST.

Genus *Pachyseris* MILNE EDWARDS & HAIME, 1849

Pachyseris valenciennesi MILNE EDWARDS & HAIME, 1851

(Plate 17, Figs. 2, 3)

Pachyseris valenciennesi	MILNE EDWARDS (& HAIME), 1860, p. 86 (synonymy).
	ORTMANN, 1889, p. 516.
	HORST, 1921, p. 36; pl. 5, fig. 2.

The five specimens in the present collection have unifacial coralla with turned-up or drooping edges. One of the specimens was lying free at the time of collection. The collines are irregular with large number of prominent protuberances. They are in the form of conical mounts with secondary collines. The specimens resemble DANA's (1846, pl. 22, fig. 1) figure of his *Agaricia rugosa*. The septa are subequal, narrow, steeply descending. Collines 2.5 to 3 mm thick with acute tops. Height 2 to 3 mm. MILNE EDWARDS (1860) speaks of the columella as poorly developed, but in the present specimens they are lamellar as in *P. rugosa* (LAMARCK).

According to HORST (1921, p. 37) "*P. valenciennesi* forms a very irregular disc with hollow protuberances and folded and turned back edges. *P. rugosa* LAM. consists of a more regular corallum attached by nearly the whole of its underside. On it there are large, massive, irregular lobes" .

Material examined: X2:16–2, Inner reef, Addu Atoll; X2: 41–8, Patch reef, Addu Atoll; X2: 76–5, Great Faro, Ari Atoll; X2: 104–8, X2: 104–12, Inner reef, Madewaru, Fadiffolu Atoll.

Distribution: Maldives; Samoa; Fiji.

Pachyseris levicollis (DANA), 1846

See SCHEER & PILLAI (1974) for subsequent literature.

Four specimens in the present collection belong to this species. The coralla are flat. In one of the specimens there is an epitheca. Collines flat at the top. Septa subequal. Columella lamellar, often looking solid.

Material examined: X2: 46–2, Northern outer reef, Addu Atoll; X2: 88–8, 88–18 and 88–38, Lagoon bottom, Rasdu Atoll.

Distribution: Red Sea eastward to Tahiti.

Genus *Gardineroseris* SCHEER & PILLAI, 1974

Gardineroseris ponderosa (GARDINER), 1905.

Agaricia ponderosa	GARDINER, 1905, p. 937; pl. 89, figs. 5, 6.
Gardineroseris ponderosa	SCHEER & PILLAI, 1974, p. 32; pl. 15, figs. 1, 2.

We have given our reasons elsewhere (SCHEER & PILLAI, 1974) for proposing a new generic name to accommodate *Agaricia ponderosa* GARDINER, 1905. We have also given a detailed description of the species based on specimens from Nicobar Islands. The present collection includes 7 specimens. In detail they show little difference from GARDINER's specimens.

Material examined: X2: 20–9, Inner reef, Abuhera, Addu Atoll; X2: 35–4 and 35–5, Xarifa Reef, Addu Atoll; X2: 69–1, Faro, Ari Atoll; X2: 89–1 and X2: 90–5, Outer reef, Weligandu, Rasdu Atoll; X2:100–18, Inner reef, Madewaru, Fadiffolu Atoll.

Distribution: Madagascar; Seychelles; Maldives; Minicoy; Nicobars; Cocos-Keeling Islands; Philippines; Tahiti.

b) Family **Siderastreidae** VAUGHAN & WELLS, 1943

Genus *Coscinaraea* MILNE EDWARDS & HAIME, 1848

Coscinaraea monile (FORSKAL), 1775

Coscinaraea monile	KLUNZINGER, 1879 b, p. 79; pl. 9, fig. 4; pl. 10. fig. 17 a, 17 b.
	GARDINER, 1905, p. 950.
	MARENZELLER, 1906, p. 64; pl. 24, fig. 83.
	CROSSLAND, 1941, p. 30; pl. 5.
Coscinaraea donnani	GARDINER, 1905, p. 950; pl. 90, fig. 12.

This rare species is represented in the present collection by a single specimen. The corallum is very thin at the growing edge, getting thicker towards the centre where it is 2.5 cm thick. An epitheca is visible at the under side. Calices in irregular rows. Distance between adjacent rows 8 to 12 mm, those of the adjacent calices within a row 3 to 5 mm. Axial fossa 1.5 mm. 12 to 15 major septa reach the columella.

Material examined: X2:88–57, Lagoon bottom, Rasdu Atoll.

Distribution: Red Sea; French Somaliland; Seychelles; Maldives; Ceylon; Southeast India (PILLAI, 1971a); Mergui Archipelago (MATTHAI, 1924).

Superfamily Fungiicae DANA, 1846

c) Family **Fungiidae** DANA, 1846

Genus *Cycloseris* MILNE EDWARDS & HAIME, 1849

Cycloseris costulata (ORTMANN), 1889

Fungia costulata	ORTMANN, 1889, p. 519; pl. 14, fig. 2.
	GARDINER, 1909, p. 271; pl. 35, fig. 9.

The five specimens in the present collection range from 36 to 44 mm in greater diameter. The heights vary from 8 to 14 mm and the length of the axial fossa from 10 to 12 mm. In all the specimens the corallum is convex with mostly flat under side. The costae extend to the centre of the disc. The costal spines small but secondarily frosted. The first two cycles of septa are the broadest and project above the axial fossa. Septal edges with very small teeth. Columella trabecular, sometimes with upwardly directed processes.

Material examined: X2: 73–5, 75–5 and 75–6, Great Faro, Ari Atoll; X2:105–8 and 105–9, Inner reef, Madewaru, Fadiffolu Atoll.

Distribution: Maldives; Ceylon.

Remarks: *C. costulata* is very near to *C. cyclolites*, but differs in the nature of the costae. In the latter species the costae are mostly straight and extend from the periphery of the disc to the centre with prominent but small and secondarily frosted spines. In *C. cyclolites* the costae are wavy towards the centre and generally have granular rounded spines. Further in *C. cyclolites* the corallum is highly convex.

Cycloseris distorta (MICHELIN), 1843

Fungia distorta	DÖDERLEIN, 1902, p. 74; pl. 3; pl. 5, figs. 3,3a; (synonymy).
	BOSCHMA. 1923, p. 142, fig. 9, fig. 10.
	BOSCHMA, 1925, p. 203; pl. 6, figs. 55–64.
Diaseris distorta	GARDINER, 1905, p. 945.
Cycloseris distorta	WELLS, 1954, p. 447.

Two specimens in the present collection are DÖDERLEIN's *Cycloseris* form of this species. They are both thick and circular, thicker at the central part of the corallum than at the periphery. The first two cycles of septa are thicker and stand high around the axial fossa. Edges of septa look entire to the unaided eye but under the lens reveal minute serrations. A few tentacular lobes are prominent. Columella spongy. Costae correspond to septa, reach to the centre of the disc, covered by closely set granules.

Material examined: X2:54–3(1,2), Patch reef, Addu Atoll.

Distribution: Red Sea eastward to Tahiti.

Genus *Fungia* LAMARCK, 1801

Fungia (Ctenactis) echinata (PALLAS), 1766

Fungia echinata	DÖDERLEIN, 1902, p. 101; pl. 10, figs. 1–5; (Synonymy).
	STEPHENSON & WELLS, 1956, p. 25.

See SCHEER & PILLAI (1974) for further literature.

Two specimens represent this species. The smaller corallum was collected soon after its separation from the anthocaulus, and the costae are visible only at the periphery of the disc.

Material examined: X2:Sch–8, Xarifa Reef, Addu Atoll; X2:39–8, Mini-Atoll, Addu Atoll.

Distribution: Red Sea eastward to Tahiti and Hawaii.

Fungia (Pleuractis) scutaria LAMARCK, 1801

Fungia scutaria	DÖDERLEIN, 1902, p. 91; pl. 8, figs. 1–6; (synonymy).

See SCHEER & PILLAI (1974) for further literature and synonymy.

Four specimens are referred to this species along with an anthocaulus. One of the specimens has a trifurcated axial fossa which is often found in this species.

Material examined: X2: 16–3, 16–9, Inner reef, Addu Atoll, X2: Sch–2, Xarifa Reef, Addu Atoll; X2: 73–6, Great Faro, Ari Atoll; X2: 81–6, Inner reef, Weligandu, Rasdu Atoll.

Distribution: Red Sea eastward to Tuamotu Archipelago.

Fungia (Danafungia) danai MILNE EDWARDS & HAIME, 1851

Fungia danai	MILNE EDWARDS (& HAIME), 1860, p. 11; pl. 10, fig. 1.
	DÖDERLEIN, 1902, p. 129; pl. 14, figs. 3, 3a; pl. 15, figs. 3, 4a; pl. 16, figs. 5, 5a; pl. 18, figs. 1–4a; (synonymy).
	GARDINER, 1905, p. 941.
	THIEL, 1932, p. 78; pl. 9, figs. 2–3.
	UMBGROVE, 1939, p. 44.
	UMBROVE, 1940, p. 294.
	YABE & SUGIYAMA, 1941, p. 79; pl. 74, figs. 1–1d.
	NEMENZO, 1955, p. 64; pl. 13, figs. 2, 3.

X2:51–4 is a circular flat disc. Every third or fifth septum is higher than the others. Major septa at the axial fossa descending vertically with entire edges. Costal elevations correspond to that of septa. The teeth on costae become smaller and obsolete towards the centre of the disc. A second specimen is arched at the under side. The costal teeth are found almost to the centre of the aboral side. Columella is spongy in both the specimens.

Material examined: X2: 51–4, 51–9, Northern reef flat, Addu Atoll.

Distribution: Seychelles (PILLAI et al., 1973); Maldives; Minicoy; Ceylon (BOURNE, 1905); Andamans (MATTHAI, 1924); Singapore; Sumatra; Philippines; Amboina; New Caledonia (CHEVALIER, 1968); Japan; Torres Strait; Tahiti.

Fungia (Verrillofungia) repanda DANA, 1846

Fungia repanda	DÖDERLEIN, 1902, p. 115; pl. 12, figs. 4, 5; pl. 13, figs. 1–3; 5–7; (synonymy).
	BOSCHMA, 1925, p. 219; pl. 7, fig. 74.
	THIEL, 1932, p. 73.
	UMBGROVE, 1939, p. 44; pl. 12, Fig. 2.
	UMBGROVE, 1940, p. 293; pl. 27, figs. 4, 5.
	YABE & SUGIYAMA, 1941, p. 78; pl. 73, figs. 2–3d; pl. 74, figs. 2–2e; pl. 75, figs. 3–3b.
	NEMENZO, 1955, p. 66; pl. 13, fig. 1a.

16 specimens belong to this species. The coralla are circular, disc-shaped and flat. The under side in all is perforate. The edges of septa are mostly entire near the axial fossa but away from the fossa with small regular teeth, about 5 in 5 mm length of septa. In the young coralla the teeth on costae are spiny, while in older ones the teeth get swollen and often fuse together to form clusters. The major difference of this species from *F. concinna* is the perforate disc.

Material examined: X2:16–13, 16–19, 16–21 and 18–31, Inner reef, Addu Atoll; X2:Sch–1, Xarifa Reef, Addu Atoll; X2: 66–6, 66–9, 66–11, 66–13, 66–14, Faro, Ari Atoll; X2: 97–21, 97–27, 97–32, Patch reef, Gaha Faro; X2: 200–1, 200–2, 200–3, Outer reef, Malos, Ari Atoll.

Distribution: Red Sea; French Somaliland; Zanzibar; Seychelles; Maldives; Ceylon; East Indies; China Sea; Philippines; Great Barrier Reef; Japan; Caroline Islands; Marshall Islands; New Britain; Samoa; Mururoa, Tuamotu Archipelago (CHEVALIER et al., 1968).

Fungia (Fungia) fungites (LINNAEUS), 1758

Fungia fungites	DÖDERLEIN, 1902, p. 136; pls. 20–25.

See SCHEER & PILLAI (1974) for further literature and synonymy.

Three specimens are referred to this species. The largest is 17 cm in diameter and is arched at the under side. The costal spines are sharp, often bifurcated. X2:35–1 is a corallum without any perforation. Columellae show different degrees of development. In the largest specimen it is rudimentary, while in others it is trabecular and well formed.

Material examined: X2:16–12, Inner reef, Addu Atoll; X2:35–1, Xarifa Reef, Addu Atoll; X2:85–6, Inner reef, Weligandu, Rasdu Atoll.

Distribution: Red Sea eastward to Somoa.

Genus *Herpolitha* ESCHSCHOLTZ, 1826

Herpolitha weberi (HORST), 1921

(Plate 18, Fig. 1)

Fungia weberi	HORST, 1921, p. 10; pl. 1, figs. 5, 6.
Herpolitha weberi	BOSCHMA, 1925, p. 226.
	YABE & SUGIYAMA, 1941, p. 80; pl. 81, figs. 2–2d.

One specimen in the present collection agrees to the original description of *Fungia weberi*. It is elongated (18 cm long), very thin at the edges, thickened to 1 cm at the central part of the disc. Width at the mid part 3 cm. The axial fossa extends the entire length. The corallum immediately around the axial fossa is a little elevated. The axial fossa is broken up into 16 secondary centres by the fusion of septa from opposite sides. Septa alternating in height at the growing edge, edges microscopically serrated, sides granular. Costae correspond to septa and are supplied with granules. Under side flat with a small scar of attachment. Columella well developed. Corallum porous.

Material examined: X2:88–34, Lagoon, Rasdu Atoll.

Distribution: Maldives; Paternoster Islands (East Indies); Palau Islands.

Remarks: The present record extends the distribution of the species to Maldives in the Indian Ocean.

Herpolitha limax (ESPER), 1797

Herpetolitha limax — MILNE EDWARDS (& HAIME), 1860, p. 24 (synonymy).
Herpolitha limax — GARDINER, 1909, p. 284; pl. 38, figs. 20–23, pl. 39, figs. 24, 25.
STEPHENSON & WELLS, 1956, p. 27.

For further synonymy and literatur see SCHEER & PILLAI (1974).

The present collection includes four specimens of this species. The largest in the present collection is 28 cm long and 6 cm broad.

Material examined: X2: 16–4, 16-5, Addu Atoll; X2: Sch-7, Xarifa Reef, Addu Atoll; X2: 51-1, Northern reef flat, Addu Atoll.

Distribution: Red Sea eastward to Tuamotu Archipelago.

Genus *Polyphyllia* QUOY & GAIMARD, 1830

Polyphyllia talpina (LAMARCK), 1816

Polyphyllia talpina — THIEL, 1932, p. 89; pl. 12, fig. 2; (synonymy).
UMBGROVE, 1939, p. 45.
EGUCHI, 1938, p. 363 (synonymy).
YABE & SUGIYAMA, 1941, p. 81; pl. 86, figs. 1–2c; pl. 87, fig. 3.
CROSSLAND, 1952, p. 155.
NEMENZO, 1955, p. 77; pl. 14, fig. 7.

A specimen in the present collection is 20 cm long and 6.5 cm broad at the mid part. The under side is arched. The axial fossa extends to the entire length of the corallum. Distance between secondary centres about 6 mm.

Material examined: X2: 101-3, Inner reef, Madewaru, Fadiffolu Atoll.

Distribution: Maldives; Nicobars; Mergui Archipelago; Singapore; Amboina; Bay of Batavia; Philippines; Ryukyu Islands; Great Barrier Reef; Palau Islands; Vanikoro, Santacruz Islands.

Genus *Halomitra* DANA, 1846

Halomitra philippinensis STUDER, 1901

Halomitra philippinensis — BOSCHMA, 1925, p. 237; pl.8, figs. 93–98; pl.9, figs. 105, 106, 111, 118, 119, 121; pl.10, figs. 127, 129; (synonymy).
THIEL, 1932, p.84 (synonymy).
YABE & SUGIYAMA, 1941, p. 82; pl.81, figs. 1–1c; pl.82; pl.83.
WELLS, 1954, p. 449.
NEMENZO, 1955, p.78; pl.14, figs. 5, 6.

X2:57-1 is part of a highly arched corallum and stands 23 cm as it rests on flat area. A central calyx, 10 mm in diameter is visible. The septo-costae around the secondary calices are up to 5 mm high with very sharp and prominent teeth. A second specimen (X2:66-7) is flat, rounded in outline with a scar of attachment at the aboral side. A central calyx is visible. The teeth on the septo-costae are spiny and close set, probably due to the juvenile nature of the specimen. The costae at the under side become obsolete towards the central part.

Two other specimens show clear signs of regeneration at the central part of the disc. One is flat, while the other is arched. In both the specimens the central calyx is not visible, being lost and the area regenerated. These two specimens show marked variations from *H. louwinae* HORST, 1921, from the Banda Sea. We agree with BOSCHMA (1925) that *H. louwinae* is based on only regenerated specimens of *H. philippinensis* and as such has no separate status.

Material examined: X2:57-1, Inner reef, Gan, Addu Atoll; X2:66-7, Faro, Ari Atoll; X2:91-1, Lagoon, Rasdu Atoll; X2:97-5, Patch reef, Gaha Faro.

Distribution: Madagascar (PICHON, 1964); Chagos; Maldives; Philippines; Moluccas; Amboina; Palau Islands; Marshall Islands; Solomon Islands; Samoa; Fiji; ?Hawaii (THIEL, 1932, not mentioned by MARAGOS, 1972).

Genus *Sandalolitha* QUELCH, 1884

Sandalolitha	QUELCH, 1884, p.294.
Doederleinia	GARDINER, 1909 (non STEINDACHNER, 1883).
Parahalomitra	WELLS, 1937.

Type species: *Sandalolitha dentata* QUELCH, 1884.

QUELCH (1886, p.143) defined the genus thus: "Corallum compound, flattened, free, much elongated and very thin. Wall sparsely perforated and extremely reduced; costae distinct, fine, subequal, closely granulated or very finely and bluntly echinulate, curving towards the short axis. Calices few, in the long diameter of the corallum; parent calicle very large, occupying the centre, forming almost the entire corallum, with very numerous septa, there being about seven complete cycles, a much larger number of cycles being developed in the long axis of the corallum; smaller calicles very few, distinctly radiate, developing in the course of and interrupting the larger septa in the long axis of the parent calicle. The septa are crowded and very long, curving towards the short axis, and of more or less equal vertical extent, very low, giving an even laminate appearance to the corallum. Synapticulae well developed and forming strong connections at the basal parts of the septa. Columella rudimentary and trabecular".

STUDER (1901) referred *Sandalolitha* to *Podabacia* and VAUGHAN & WELLS (1943) merged it with *Fungia*. WELLS (1954) treated this genus along with his *Parahalomitra*, remarking: "if the present reference of *S. dentata* to *Parahalomitra* proves correct, then *Sandalolitha* will have precedence over my *Parahalomitra*". This opinion he repeated in his (WELLS, 1966) account of the Evolution of the Fungiidae.

The present collection includes 16 specimens of this genus, one of which exactly fits in with the description of *S. dentata*, one to *Doederleinia irregularis* and the rest to *Halomitra robusta*. In addition to this we have studied a number of specimens in BMNH of this genus. QUELCH's type of *S. dentata* could not be located in BMNH, though PILLAI searched for it during his two visits. It is either misplaced or being lost. After examination of all these materials we are convinced *Sandalolitha* and *Parahalomitra* are generically not different and the former has priority. The genus is known to have two species, *S. dentata* and *S. robusta*.

Sandalolitha dentata QUELCH, 1884

(Plate 18, Fig. 2)

Sandalolitha dentata	QUELCH, 1886, p.144; pl.7, figs. 1–1d
Parahalomitra dentata	WELLS, 1954, p.450.

The corallum is oval in outline, total length 13.5 cm, greater width 8.5 cm, thickness about 8 mm. Under side a little arched with a broad scar of attachment. Costae closely set, with rounded secondarily frosted teeth, 15 to 20 per cm length of costae. Corallum with elongated slits at the under side. There is a central mouth 8 mm in diameter. The central calyx is surrounded by 8 secondary calices. Most of the septa are uninterrupted and extend to the periphery of the disc. Septal teeth small, 8 to 10 per cm length of septum, higher cycles of septa have entire edges. Sides of septa granular. Columella of the central calyx rudimentary, the calicular bottom being almost solid.

Material examined: X2:97-11, Patch reef, Gaha Faro.

Distribution: Previous records of this species are from Tahiti (type locality) and Marshall Islands. The present record extends its distribution to Maldives in the Central Indian Ocean.

Remarks: *S. dentata* differs from *S. robusta* (vide infra) in a more regular *Fungia*-like corallum and in the presence of comparatively fewer secondary calices. So far only three specimens of this species have been collected including the type and it is yet to be ascertained whether it represents a retarded stage of growth of *S. robusta* with few secondary calices developed.

Sandalolitha robusta (QUELCH), 1886

(Plate 18, Figs. 3, 4)

Podabacia robusta	QUELCH, 1886, p.140, pl.6, figs. 5–5b.
Doederleinia irregularis	GARDINER, 1909, p.282; pl.39, figs. 27, 28.
Halomitra robusta	THIEL, 1932, p.84; pl.11, figs. 1, 2; (synonymy).
	UMBGROVE, 1940, p.295; pl.27, fig. 2.

	YABE & SUGIYAMA, 1941, p.82; pl.81, figs. 3–3a; pl. 84, 85; pl.86, fig. 3.
	CROSSLAND, 1952, p.155.
Parahalomitra robusta	WELLS, 1954, p.449; pl.161, figs. 4, 5; pl.162, figs. 1, 2.
Parahalomitra robusta and P. irregularis	NEMENZO, 1955, pp. 79–81; pl.1, fig. 4; pl. 13, figs. 4, 5.

15 specimens are referred to this species. The smallest in the collection is a young anthocaulus 6 × 6 mm in diameters. The identity of this minute specimen, however, is not beyond doubt. A second anthocaulus is 36 mm in greater diameter with a non-porous corallum. There are two secondary centres. The rest of the specimens are all adult coralla of varying size. They are cup-shaped, flat disc-shaped or concave at the under side. Some of the specimens were attached and were collected by breaking away from the substratum. The largest specimen in the collection (X2:67-1) is 14 cm in diameter and 1 cm thick and is disc-shaped. In all the specimens the entire calicinal side is covered by secondary calices, that are placed close together. The septo-costae are alternating in size. Invariably the coralla are porous at the under side.

Material examined: X2:16–22, X2:18-14, Inner reef, Hitaddu, Addu Atoll; X2:45-3(1), Xarifa Reef, Addu Atoll; X2:66-5, 66-8, X2:67-1, 67-2, Faro, Ari Atoll; X2:100-5, 100-20, X2:104-3, 104-11, 104-13; X2:105-2, 105-5, Inner reef, Madewaru, Faddiffolu Atoll; X2:107-2, Inner reef, Kuludu, Miladummadulu Atoll.

Distribution: Maldives; Minicoy (PILLAI, 1971, as *Podabacia crustacea*) Malay Archipelago; Philippines; Celebes; Amboina; Great Barrier Reef; Palau Islands; Marshall Islands; New Guinea; Solomon Islands; Society Islands; Mururoa, Tuamotu Archipelago.

Superfamily Poriticae GRAY, 1842

d) Family *Poritidae* GRAY, 1842

Genus *Goniopora* DE BLAINVILLE, 1830

The present collection includes 6 species of this genus. Out of these one is already described by BERNARD (1903) from the Maldives but he has not given a binominal name. It is named here *G. granulosa.*

Goniopora stokesi MILNE EDWARDS & HAIME, 1851

Goniopora stokesi	MILNE EDWARDS (& HAIME), 1860, p.192.
Goniopora Maldives 4	BERNARD, 1903, p.89; pl.7, fig.6; pl.13, fig.9.

For further literature and synonymy see SCHEER & PILLAI (1974).

There is a good suite of specimens in the present collection. They vary from single calices to young hemispherical colonies („Ableger", SCHEER 1960, or "Polyp balls", ROSEN & TAYLOR 1969) and finally to club- and horn-shaped adult colonies. We have described specimens from Nicobar Islands in our above cited paper and it seems unnecessary to repeat those details here.

Material examined: X2:19-1, 19-2 (includes several specimens), Inner reef, Hitaddu, Addu Atoll; X2:88-19, 88-20, 88-21, 88-22, 88-23, 88-24, 88-25, 88-26, 88-27, Lagoon, Rasdu Atoll.

Distribution: East African coast eastward to Philippines.

Goniopora sp.cf. *pulvinula* WELLS, 1954

Goniopora pulvinula	WELLS, 1954, p.451; pl.164, figs. 3, 4.

Three specimens before us agree in general characters with *G. pulvinula* from Marshall Islands. They are encrusting, layer over layer, tending to become pulvinate. The largest specimen in the collection is 12 × 10 cm in spreads and has a convex upper surface. Calices shallow, flush with the surface, rounded, 2 to 3 mm in diameter (in X2:88-17 they are 2 to 2.5 mm and in the other two specimens they are 3 mm). Wall 1 to 2 mm thick, flattened. Septa

irregular in numbers though typically 24 with 2 to 3 vertical elements between the wall and columella. Columella almost fills the bottom of the calyx.

Material examined: X2:88-17, 88-32 and 88-58, Lagoon, Rasdu Atoll.

Distribution: The type locality of this species is Bikini Atoll, Marshall Islands. The present record extends its distribution to Maldives in the Central Indian Ocean.

Goniopora granulosa new name

(Plate 19, Figs. 1,2)

Goniopora Maldives 1 BERNARD, 1903, p.86; pl.7, fig. 1; pl.13, fig. 6.

Description of the present specimen: Corallum encrusting, getting thicker by repeated overgrowth. The under side reveals signs of several layers all covered by epitheca. Edges free. Greater diameter of the corallum 9 cm. The living layer is only a patch about 3 mm thick with the epitheca projecting a little beyond the growing edges. Corallites polygonal, mostly pentagonal. Calices rounded, superficial; wall thin but solid. Diameter of calices generally 2 mm rarely 2.25 mm. Septa 24, the tertiaries fusing to the secondaries so that a triplet and a single alternate. All septa look like as if composed of a row of tufted spines. There are 3 to 4 such spines on a septum depending on the length of the latter. The topmost spine is situated nearly on the top of the wall. The pali are not distinguishable from the septal spines. Columella poorly developed, resembles to that of *Porites*, represented by a single style which is often frosted.

Material examined: X2:88-35, Lagoon, Rasdu Atoll. BERNARD's specimen is from Addu Atoll.

Remarks: At least two other species of *Goniopora* viz *G. hirsuta* CROSSLAND, 1952, and *G. nigra* PILLAI, 1969, have similar polygonal shallow corallites and septa as in *G. granulosa*. *G. hirsuta* is based on a minute specimen and it has only 12 septa with rudimentaries of the third cycle. The structure of the wall seems to differ from the present species. *G. nigra* from Southeast India has a pulvinate corallum with 24 equal septa reaching a styliform columella. Further, in *nigra* the corallum is invariably black.

Goniopora minor CROSSLAND, 1952

Goniopora minor CROSSLAND, 1952, p.233; pl.48, figs. 1, 3.
NEMENZO, 1955, p.51; pl.8, fig. 5.
PILLAI et al., 1973, p.459.
STEPHENSON & WELLS, 1956, p.27.

There are five specimens in the present collection belonging to this species. BERNARD's (1903) account of *Goniopora* from the Maldives does not seem to include this species though WELLS & DAVIES (1966) has noted its presence at Addu Atoll. The largest specimen in the present collection is massive, covering a dead coral. The basic growth-form of this species seems to be encrusting. Calices 2 mm in diameter, 1.5 mm deep. Septa show variation in number in different calices. Generally there are 12 septa with an incomplete cycle of tertiaries. In a few calices, however, all the 24 septa can be made out. The third cycle of septa fuses to the sides of the second cycle. Septa steeply descending at the top of the wall. Columella occupies most of the bottom of the calyx. Six pali are often visible.

Material examined: X2:66-3, Faro, Ari Atoll; X2:88-11, Lagoon, Rasdu Atoll; X2:97-12 and 97-31, Patch reef, Gaha Faro; X2:101-1, Inner reef, Madewaru, Fadiffolu Atoll.

Distribution: Seychelles; Maldives; Minicoy (PILLAI, 1971); Philippines; Great Barrier Reef.

Goniopora duofaciata THIEL, 1932

Goniopora duofaciata THIEL, 1932, p.134; pl.20, fig. 1.
PILLAI et al., 1973, p.459.
Goniopora duofasciata NEMENZO, 1955, p.52.
Goniopora Maldives 2 BERNARD, 1903, p.87; pl.7, figs. 2, 3; pl.13, fig. 7.

One of our specimens agrees with BERNARD's description very well. It is columnar with a total height of 10 cm and a thickness of 5 cm. The top is obtuse. An epitheca is present at the lower part. The calices, as the specific name implies, display two facies. At the top of the column they are 2 to 2.5 mm in diameter, so much deep with very thin wall. Two

cycles of septa with a set of rudimentary tertiaries present. Columella well formed but no pali. At the sides of the column the calices are nearly 4 mm in diameter, polygonal; wall up to 1 mm thick. Septa 24, all well developed, but tertiaries smaller, leaving large interseptal loculi. Septal edges dentate, sides granular. Pali poorly developed.

Material examined: X2:35-13, Xarifa Reef, Addu Atoll.

Distribution: Seychelles; Maldives; Mandapam (PILLAI, 1971a); East Indies; Philippines (NEMENZO, 1955).

Remarks: The growth-form of the present specimen almost resembles one of our specimens of *G. columna* from Nicobar Islands (SCHEER & PILLAI, 1974), but the structure of the calices seems to be different. In *G. columna* the corallites are mostly of the same size whereas in *G. duofaciata* they are smaller at the top of the column.

Goniopora planulata (EHRENBERG), 1834

(Plate 19, Fig. 3)

Goniopora planulata KLUNZINGER, 1879a, p. 45; pl. 5, fig. 24; pl. 8, fig. 23.

KLUNZINGER (1879a) has doubtfully referred *G. columna* DANA to the synonymy of *G. planulata*. According to CROSSLAND (1952) KLUNZINGER's *G. planulata* is a stunted specimen of *G. columna*. UMBGROVE (1939) believed that they are separate. Following UMBGROVE, we (SCHEER & PILLAI, 1974) have reported specimens from Nicobar Islands as *G. columna*. However, after examination of a large number of specimens from Red Sea and other parts of the Indian Ocean we are convinced that *G. columna* is the same as *G. planulata*, the supposed variations are only skeletal.

We have before us two specimens. They are columnar, the columns dividing at the top. The lower parts are dead, the living layer extending to 4 cm from the top. Corallites polygonal, calices oval or rounded. Diameter of the calices 4 to 5 mm, depth 3 mm. Septa 24, mostly regular, the tertiaries fuse to the secondaries. Septa descending vertically at the wall, edges with 4 to 5 teeth. 6 to 12 pali present of which those of the primaries are very prominent and frosted. They stand very high above the columella. Columella loose trabecular or sometimes solid.

Material examined: X2:66-2, Faro, Ari Atoll; X2:88-10, Lagoon, Rasdu Atoll.

Distribution: Red Sea; Maldives; probably more wide-spread when the synonymy is fully worked out.

Genus *Porites* LINK, 1807

α) Branching species of *Porites:*

Porites profundus REHBERG, 1892

(Plate 20, Figs. 1, 2)

Porites profundus REHBERG, 1892, p.48; pl.3, figs. 4, 5, 6.
Porites Madagascar 1 BERNARD, 1905, p. 228.

Description of the present specimens: Corallum palmately branching, Basal parts of the main divisions rounded and getting expanded as it grows. Upper branchlets digitiform, 3 to 4 cm long, 10 to 13 mm thick, tapering towards the tip. Tip sometimes a little flattened. Fusion of branchlets very rare. Corallites polygonal, generally 2 mm in length, 1 to 1.5 mm in depth. Wall very thin. Septa begin a little below the summit of the wall; thick, irregular in number, 2 to 3 often missing. The triplet of the septa do not fuse each other. Fusion of the lateral pairs of septa hardly visible, since they descend vertically down into the columella tangle. Pali not conspicuous. Columella deep seated into which the septa merge. Outer synapticular ring fused with the wall and not visible, inner around the columella.

This species is characterized by a ramose corallum with palmate branches and large deep calices with irregular septal plan. Pali are suppressed.

Material examined: X2:Sch-37, X2:29-9, Xarifa Reef, Addu Atoll.

Distribution: Madagascar; Maldives.

Porites andrewsi VAUGHAN, 1918

Porites andrewsi VAUGHAN, 1918, p.203; pl.91, figs. 1, 1a, 2, 2a.
HOFFMEISTER, 1925, p.77; pl.22, figs. 2a–2c.
PILLAI & SCHEER, 1973, p. 471.

THIEL, 1932, p. 135; pl. 13, fig. 3; (synonymy)
WELLS, 1954, p. 454; pl. 165, fig. 4; pl. 169, figs. 5, 6.
STEPHENSON & WELLS, 1956, p. 28.

We refer five specimens to this species. One of the specimens has a semi-arborescent growth-form. It has a total height of 15 cm. The upper branchlets are 7 to 8 mm in thickness. The calices in all the specimens are shallow, superficial, with the septal and palar elements frosted. There are up to 8 pali, though those of the laterals of the triplet of septa are very short. Generally only six prominent pali present. There are two septal denticles between palus and wall, the outer one being very near to the wall. Unbleached dried coralla turn black in colour.

Material examined: X2:34-13, Outer reef, Hitaddu, Addu Atoll; X2:65-2, 65-3; X2:66-1, Faro, Ari Atoll; X2:200-4, Outer reef, Malos, Ari Atoll.

Distribution: Madagascar (PICHON, 1964); Maldives; Minicoy (PILLAI, 1971); Nicobars; Java; Banda Sea; Palau Islands; Marshall Islands; Solomon Islands; Great Barrier Reef; Samoa; Fiji; Tonga.

β) Encrusting and massive species of *Porites:*

Porites lichen DANA, 1846

Porites lichen

DANA, 1846, p. 566; pl. 56, fig. 4.
WELLS, 1954, p. 453; pl. 165, fig. 3; pl. 168, figs. 1–6; (synonymy).
SCHEER, 1964, p. 460; pl. 4, figs. 1, 2.

Four encrusting specimens are referred to this species. One of them has a hillocky upper surface due to repeated growth and seven layers can be made out at the under side. X2:43–3 is fan-shaped foliaceous growth attached at one edge. In all the specimens the corallites are polygonal with interrupted wall. In some cases the corallites run together without intervening wall. Septal plan irregular. Pali 8, those of the lateral pairs of septa being the largest. Columella a compressed steyle or even absent leaving an open fossa at the bottom of the calyx.

Material examined: X2:34–12, X2:43–3 and 43–9, Outer reef, Hitaddu, Addu Atoll; X2:105–7, Inner reef, Madewaru, Fadiffolu Atoll.

Distribution: Abd-el-Kuri; Maldives; Gulf of Mannar (PILLAI, 1971a); Cocos-Keeling Islands (VAUGHAN, 1918); East Indies (*P. viridis*, UMBGROVE, 1940); Murray Islands; Palau Islands; Rotuma (*P. viridis* Gardiner, 1898); Samoa; Fiji; Mururoa, Tuamotu Archipelago (CHEVALIER et al., 1968).

Porites lutea MILNE EDWARDS & HAIME, 1851

Porites lutea

VAUGHAN, 1918, p. 198; pl. 88, figs. 1–1b; (synonymy).
WELLS, 1954, p. 452; pl. 165, figs. 1, 2; pl. 166, figs. 5, 6; pl. 167, figs. 1–7; (synonymy)
For further literature and synonymy see SCHEER & PILLAI (1974).

Material examined: X2:20–14, Inner reef, Abuhera, Addu Atoll; X2:20–15(2), locality as above, found attached to a colony of *P. solida*; X2:29–7, Xarifa Reef, Addu Atoll; X2:34–9, Outer reef, Hitaddu, Addu Atoll; X2:39–12, Mini Atoll, Addu Atoll; X2:50–14, 50–18, Northern reef flat, Addu Atoll; X2:90–6, 90–9 and 90–30, Outer reef, Weligandu, Rasdu Atoll; X2:200–5, Outer reet, Malos, Ari Atoll.

Distribution: Red Sea (ROSSI, 1954) eastward to Tuamotu Archipelago (CHEVALIER et al., 1968).

Porites solida (FORSKAL), 1775

Porites solida

VAUGHAN, 1918, p. 191; pl. 84, figs. 3, 3a; (synonymy).
CROSSLAND, 1941, p. 21; pls. 1–3; pl. 4 (upper fig.).
WELLS, 1950, p. 45.
CROSSLAND, 1952, p. 242.

Material examined: X2:16–16, Inner reef, Addu Atoll; X2:18–3, 18–4, 18–11, 18–21, 18–32, Inner reef, Hitaddu, Addu Atoll; X2:20–15 (1), Inner reef, Abuhera, Addu Atoll; X2:31–13, Wreck, Addu Atoll; X2:34–2,

X2: 43–2, Outer reef, Hitaddu, Addu Atoll; X2: 67–8, Faro, Ari Atoll; X2: 75–8, Great Faro, Ari Atoll; X2:90–14, 90–17 and 90–22, Outer reef, Weligandu, Rasdu Atoll.

Distribution: Red Sea; Maldives; Laccadives; Palk Bay and Gulf of Mannar along the Indian coast; Tuticorin; Andamans; Nicobars; Cocos-Keeling Islands; Great Barrier Reef.

Porites murrayensis VAUGHAN, 1918

Porites murrayensis VAUGHAN, 1918, p. 192; pl. 84, figs. 4, 4a, 4b, 5.
For further literature see SCHEER & PILLAI (1974).

We have four specimens before us that we place under this species. They represent either initial encrustations or parts of large massive colonies. It may be pointed out here that in some of our present specimens of *P. solida* (vide supra) the top of the corallum shows rounded, deep calices similar to *P. murrayensis* and in odd pieces it will be difficult to separate them except for the well developed pali of *P. murrayensis*. It will be interesting to examine more specimens to ascertain the relationship of these two species.

Material examined: X2: 90–18, 90–26, 90–27 and 90–32, Outer reef, Weligandu, Rasdu Atoll.

Distribution: Maldives; Nicobars; Murray Islands; ? Philippines; ? Palau Islands; Marshall Islands; Hawaii (as *P. brighami*, see WELLS, 1954).

Subgenus *Synaraea* VERRILL, 1864

WELLS & DAVIES (1966) in their preliminary list of corals from the Addu Atoll mention *P. (Synaraea) monticulosa* DANA and *P. (Synaraea) horizontalata* HOFFMEISTER. We have 14 specimens of this subgenus. Superficially viewed, they look as a heterogeneous assemblage differing slightly in their growth-forms but they all have similar calicular structure and coenenchymal characters. We identify them as follows.

Porites (Synaraea) convexa (VERRILL), 1864

(Plate 20, Fig. 3; Plate 21, Figs. 1–3)

Synaraea convexa VERRILL, 1864, p. 43.
Porites Society Islands 3 BERNARD, 1905, p. 30; pl. 1, figs. 3, 4, 5; pl. 10, fig. 5.
Porites (Synaraea) convexa HOFFMEISTER, 1929, p. 365.
SEARLE, 1956, p. 19; pl. 23, fig. A.
Porites (Synaraea) undulata (non KLUNZINGER) HOFFMEISTER, 1925, p. 79.

Five of the present specimens (X2:47–1, 63–12, 66–12, 69–2 and 92–4) are foliaceous or thin encrustations showing the initial stage of growth. In one of these (92–4) the upper side has two small digitiform branches. X2: 92–1 is tufted, ramose with thin encrustations at the basal parts similar to the foliaceous ones in the collection. X2: 55–1 is ramose resembling some specimens of *Montipora ramosa (M. divaricata)* in habit. X2: 85–4 is a thick columnar growth. X2: Sch 9(1, 2) are two pieces with digitiform branches. In larger specimens wherever the branches are fully formed they undergo coalescence. The following is a general description of the specimens.

Calices rounded, 0,5 to 0.6 mm in diameter, superficial, arranged in valleys formed by the coenenchymal foveolations. Septa 12, in typical poritid pattern, the triplet often forms a trident. Pali 5 to 6, very prominent, stand above the level of the wall. A columella style may or may not be present. Between the wall and the palus there is a septal denticle. The surface coenenchyme under the lens looks spiny. In some specimens the surface rises in the form of papillae of *Montipora*, being conical, but in others they run together to form ridges.

But for the presence of specimens having branches as well as explanate thin growths at the base, one will be tempted to identify odd explanate pieces as distinct species. The present suite of specimens, in fact, throws some doubt on the validity of some species of *Synaraea* characterized with an explanate corallum. It is quite possible that they are only initial growths of some other species. BERNARD's description of DANA's *Porites monticulosa* shows very little difference from the present specimens. It is possible that WELLS & DAVIES (1966) and the present authors are dealing with the same species under different names. We are unable to say at this moment whether *P. monticulosa* and *P. (Synaraea) convexa* are one and the same, probably they are same, and in that case DANA's name has priority.

Material examined: X2: Sch–9 (1,2), Xarifa Reef, Addu Atoll; X2: 47–1, Northern outer reef, Addu Atoll; X2:55–1, Patch reef, Addu Atoll; X2:63–2, Fulu, Suvadiva Atoll; X2:66–12 and 69–2, Faro, Ari Atoll; X2:73–3, Great Faro, Ari Atoll; X2:85–4 and 85–5, Inner reef, Weligandu, Rasdu Atoll; X2: 90–28, X2:92–1, 92–3 and 92–4, Outer reef, Weligandu, Rasdu Atoll.

Distribution: Maldives; Gulf of Mannar, South India; Singapore; Somoa; Tahiti.

Genus *Alveopora* DE BLAINVILLE, 1830

WELLS (1954) writing on the *Alveopora* from the Marshall Islands remarked: „About 13 species of *Alveopora* are known from the Indo-Pacific. None of them is common, and the genus as a whole is not well known. Species criteria lie principally in size of corallites and number of septal spines".

We have been able to check at least 15 species of this genus so far recorded from the Indo-Pacific. The following is a list with references.

1. *A. fenestrata* (LAMARCK), 1816. (MILNE EDWARDS (& HAIME), 1860, p. 194).
2. *A. viridis* QUOY & GAIMARD, 1833. (MILNE EDWARDS (& HAIME), 1860, p. 194; UMBGROVE, 1939, p. 59; pl. 18, figs. 4, 5).
3. *A. daedalea* (FORSKAL), 1775. (MILNE EDWARDS (& HAIME), 1860, p. 194; KLUNZINGER, 1879a, p. 47; pl. 5, figs. 25, 26; UMBGROVE, 1939, p. 59; CROSSLAND, 1952, p. 195.)
4. *A. retepora* (ELLIS & SOLANDER), 1786. (ELLIS & SOLANDER, 1786, p. 172; pl. 54, figs. 3, 4, 5; MILNE EDWARDS (& HAIME), 1860, p. 195.)
5. *A. octoformis* DE BLAINVILLE, 1830. (DE BLAINVILLE gives no description, a short one is found in MILNE EDWARDS (& HAIME), 1860, p. 195.)
6. *A. verrilliana* DANA, 1846. (DANA, pl. 48, fig. 4; VAUGHAN, 1907, p. 217; pl. 91, figs. 3, 3a; HOFFMEISTER, 1925, p. 81; UMBGROVE, 1939, p. 59; pl. 5, fig. 4; pl. 18, figs. 2, 3.)
7. *A. tizardi* BASSETT-SMITH, 1890. (BASSETT-SMITH, 1890, p. 358.)
8. *A. allingi* HOFFMEISTER, 1925. (HOFFMEISTER, 1925, p. 81; pl. 23, figs. 2–2c; STIASNY, 1830, p. 35; pl. 3, fig. 3; pl. 5, fig. 1; WELLS, 1954, p. 456; pl. 163, figs. 9, 10.)
9. *A. irregularis* CROSSLAND, 1952. (CROSSLAND, 1952, p. 234; pl. 49, fig. 2; pl. 50, fig. 1.).
10. *A. mortenseni* CROSSLAND, 1952. (CROSSLAND, 1952, p. 235; pl. 49, figs. 1, 3–4.)
11. *A. regularis* THIEL, 1932. (THIEL, 1932, p. 139; pl. 12, fig. 4.)
12. *A. excelsa* VERRILL, 1864. (STUDER, 1880, p. 25; SEARLE, 1956, p. 19; pl. 24, fig. B.)
13. *A. ocellata* WELLS, 1954. (WELLS, 1954, p. 456; pl. 164, figs. 5–7.)
14. *A. japonica* EGUCHI, 1968. (EGUCHI, 1968, p. C 19 with several figures.)
15. *A. fijiensis* HOFFMEISTER, 1932. (cited after WELLS, 1954, p. 393.)

In addition to the above, there are several specimens of Alveopora housed in BMNH, some of them bearing specific names other than those mentioned above. The reference could not be checked and we think they are only manuscript names. We are here publishing a list of them with the respective register numbers in the hope that it will be of use to future workers who may attempt a monographic treatment of the genus.

1. *Alveopora simplex* (BMNH 82–2–23–151, Admiralty collection, Torres strait).
2. *A. trabecularis* Saville Kent (BMNH 1892–12–1–170, probably from Thursdy Island).
3. *A. pulcherrima* Bassett-Smith (Type. BMNH 1893–9–1–138, China Sea).
4. *A. primitiva* (Type. BMNH 92–1–16–20, N. W. Australia).
5. *A. inaequalis* (Type. BMNH 1893–9–1–136, China Sea).
6. *A. kenti* (BMNH 92–12–1–159, Australia).
7. *A. conspicua* (Type. BMNH 1883–7–27–25, Mauritius).
8. *A. lobata* (Type. BMNH 92–22–1–635, Great Barrier Reef).

Out of these, *A. primitiva and A. simplex* are characterized by thick intercorallite walls and 12 prominent septa of which the primaries are very thick. These two possibly belong to one species. *A. lobata, A. conspicua* and *A. kenti* show the same appearance as *A. mortenseni* (note CROSSLAND, 1952, mentions the occurrence of the last named species in Mauritius) and all are probably one and the same. *A. pulcherrima* has a branching corallum with corallites ranging from

2 to 2.5 mm in length. *A. inaequalis* has similar growth from as in *A. pulcherrima* but has larger calices as in *A. allingi* and *A. irregularis* CROSSLAND.

The present collection includes a good suite of specimens, of which we recognize four species, one of which is new to science.

Alveopora daedalea (FORSKAL), 1775

(Plate 22, Fig. 1)

For synonymy and literature see under the list of species above.

Three small, massive, rounded colonies agree to KLUNZINGER's (1879a) description of this species. The largest colony in the collection is 3.25 cm in greater diameter and the smallest about 2 cm. The polygonal corallites are 1.5 to 2 mm in diameter and depth. The septa of the primary cycle are thicker and often reach the centre of the axial fossa. At the wall they project to half the radius circle. The secondaries are poorly developed.

Material examined: X2:39–7, Mini Atoll, Addu Atoll; X2:66–10, Faro, Ari Atoll; X2:100–22, Inner reef, Madewaru, Fadiffolu Atoll.

Distribution: Red Sea; Maldives; East Indies.

Alveopora mortenseni CROSSLAND, 1952

(Plate 22, Figs. 2, 3)

Alveopora mortenseni CROSSLAND, 1952, p. 235; pl. 49, figs. 1, 3, 4.

We refer three specimens to this species. They agree to CROSSLAND's type (BMNH 1934–5–14–411). X2:88–12 represents the upper part of a branch. The calices are about 3 mm deep, 3 mm in diameter with rounded openings. Septa in three cycles, the tertiaries incomplete. All septa hairy, meeting at the bottom of the calyx forming a loose columella. X2:17–5 is partly dead, the living zone is in the form of a cap at the top followed by an epitheca. The calices are only 2 mm in diameter. The septa a little thickened hardly meet each other to form a columella. The third specimen is represented by two dead branches fused each other by a fresh growth. In this specimen the septa show different degrees of development. In some calices they project only half way while in others they fuse to form a loose columella.

Material examined: X2:17–15, Inner reef, Hitaddu, Addu Atoll; X2:88–12, 88–49, Lagoon, Rasdu Atoll.

Distribution: ?Red Sea (CROSSLAND, 1952); Mauritius; Maldives; Great Barrier Reef.

Alveopora allingi HOFFMEISTER, 1925.

(Plate 23, Fig. 1)

Alveopora allingi HOFFMEISTER, 1925, p. 81; pl. 23, figs. 2a–2c.
WELLS, 1954, p. 456; pl. 163, figs. 9, 10.

The present specimen is a thick branch with a total height of 9.5 cm. At the top it trifurcates. The basal thickness of the main stem is 3.5 cm. The lower part is dead and covered by an epitheca. Calices polygonal, 4 to 5 mm in length, depth 4 mm. Wall very thin, highly porous. Septa in two cycles, narrow and obsolete at the top of the wall, below fusing to form a loose large columella filling the bottom of the calyx.

Material examined: X2: 88–31, Lagoon, Rasdu Atoll.

Distribution: Maldives; Sumatra; Marshall Islands; Samoa.

Alveopora superficialis n. sp.

(Plate 23, Figs. 2–4)

Description of the holotype: Corallum explanate, thick, attached only at one edge with most of the under side free and covered by an epitheca. Greater diameter 8 cm. Thickness at the growing edge 10 to 12 mm, at the broken edge 25 mm. Upper part of the corallum almost level.

Calices neatly rounded, close together, intercorallite wall very thin, only 0.1 to 0.2 mm, adjacent ones almost fused. Calices superficial, diameter 1.5 to 1.75 mm with younger ones (diameter 1 mm) intercalated. Septa 12, subequal in thickness, horizontally extending, hair-like. The primaries extend to the centre of the calyx to form a columella which

occupy about 1/3 of the bottom of the calyx. The secondaries either directly reach the columella or they turn towards and fuse with the primaries a little away from the columella. The interseptal spaces are oval in outline and the calyx, when looked from above, has the appearance of a wheel. The corallum is very light and fragile.

Material examined: X2: 88–44 (holotype), Lagoon, Rasdu Atoll.

Remarks: Among the described species of the genus, *A. superficialis* is nearer to *A. ocellata* than to any other. According to WELLS (1954) *A. ocellata* has thicker primaries than the secondaries and the secondaries are rudimentary. In the present species both the cycles of septa are well developed and are subequal in thickness. *A. superficialis* new species is characterized by an explanate corallum, small rounded, superficial calices (0.5 mm deep), subequal septa and regular oval wide interseptal spaces.

3. Suborder Faviina VAUGHAN & WELLS, 1943
Superfamily Faviicae GREGORY, 1900

a) Family **Faviidae** GREGORY, 1900
Subfamily Faviinae GREGORY, 1900

Genus *Caulastrea* DANA, 1846

Caulastrea furcata DANA, 1846

(Plate 24, Fig. 1)

Caulastrea furcata

MATTHAI, 1928, p. 273; pl. 44, figs. 5 b, 6; pl. 45, fig. 3; pl. 61, fig. 3; pl. 62, figs. 6, 12; (synonymy).
YABE, SUGIYAMA & EGUCHI, 1936, p. 19; pl. 9, fig. 3; pl. 14, fig. 6; pl. 15, figs. 4, 5; pl. 28, fig. 1.
CROSSLAND, 1952, p. 140.
STEPHENSON & WELLS, 1956, p. 29.
NEMENZO, 1959, p. 84; pl. 3, fig. 2.
PILLAI et al., 1973, p. 460; pl. 1, figs. 1a, 1b.

Part of a corallum has short branches 15 to 18 mm in length, the lower part being dead. Corallites oval or elongated, diameter 10 to 12 mm, depth 5 to 6 mm, adjacent ones 5 to 6 mm apart. Total number of septa 32 to 40, of which half the number are exsert up to 2 mm and sometimes sligthly arched. Major septa a little swollen at the wall. Septal edges dentated. Columella trabecular. Costae of the major septa uneven, irregularly swollen, edges with spines.

Material examined: X2:83–4 and 83–7, Inner reef, Weligandu, Rasdu Atoll.

Distribution: Seychelles; Maldives; Philippines; Great Barrier Reef; Japan; Palau Islands; Solomon Islands, New Caledonia (WIJSMAN-BEST, 1972).

Caulastrea tumida MATTHAI, 1928

(Plate 24, Fig. 2)

Caulastrea tumida

MATTHAI, 1928, p. 275; pl. 72, figs. 5–6.
YABE, SUGIYAMA & EGUCHI, 1936, p. 19; pl. 10, figs. 6, 7; pl. 13, figs. 1–2.
UMBGROVE, 1939, p. 25; pl. 2, fig. 1.
NEMENZO, 1959, p. 85.

The present collection includes a single specimen of this species. There are altogether 7 corallites of which one is undergoing division. The largest corallite is 18 mm in diameter and 10 mm deep with 42 septa. Major septa 2 mm exsert with regularly dentated edges. The lower part of the septa simulate a palus. Columella well developed, of twisted trabeculae. Costae extend to the base of the branches. Subsidiary septa unite with the major before the latter fuse to the columella.

Material examined: X2:88–40, Lagoon, Rasdu Atoll.

Distribution: Maldives; East Indies; Philippines; Australia; Japan.

Genus *Plesiastrea* MILNE EDWARDS & HAIME, 1848

Plesiastrea versipora (LAMARCK), 1816

See SCHEER & PILLAI (1974) for literature and synonymy.

Part of a thick encrusting corallum represents this species. The calices are 4 to 5 mm in diameter, projecting to 1 mm, 1 to 2 mm apart. Septa 30 to 32, of which half the number reach the columella. Pali well developed. Costea meet at the middle of the intercorallite area.

Material examined: X2:100-11, Inner reef, Madewaru, Fadiffolu Atoll.

Distribution: Central Indian Ocean eastward to Tuamotu Archipelago.

Genus *Favia* OKEN, 1815

Favia stelligera (DANA), 1846.

Favia acropora	MATTHAI, 1914, p.102; pl.25, figs. 1, 3; pl.26, fig. 4; pl.33, fig. 1; (synonymy).
Favia stelligera	VAUGHAN, 1918, p.101; pl.34, figs. 2–3; pl.35, figs. 1–4; (synonymy).

See SCHEER & PILLAI (1974) for further literature.

8 specimens show the typical hillocky growth-form of this species. The calices range from 2 to 2.5 mm in diameter. Pali are well developed in most of the specimens.

Material examined: X2:17-13, X2:18-23, Inner reef, Hitaddu, Addu Atoll; X2:51-10, Northern reef flat, Addu Atoll; X2:90-10, Outer reef, Weligandu, Rasdu Atoll; X2:100-8 and 100-21, X2:105-4, 105-10, Inner reef, Madewaru, Fadiffolu Atoll.

Distribution: Red Sea eastward to Tuamotu Archipelago.

Favia speciosa (DANA), 1846

Favia clouei	MATTHAI, 1914, p.89; pl.10, fig.6; pl.23, figs. 1, 2, 5; pl.25, fig.2; pl.34, fig.1; (synonymy).
Favia speciosa	VAUGHAN, 1918, p.103; pl.36, figs. 1–4a; pl.37, figs. 1–4a. NEMENZO, 1959, p.87; pl.4, fig.1.

The present collection includes 9 specimens of this species. In growth-form they range from explanate to rounded massive ones. All the specimens are light with highly vascular peritheca. The corallites are level or projecting up to 3 mm in different specimens. Calices rounded, oval or a little elongated. Costae prominent with regular teeth at the edges. According to MATTHAI (1914) the septa of this species are swollen at the wall, but in the present suite none shows such a condition.

Material examined: X2:Sch-15, Xarifa Reef, Addu Atoll; X2:34-11, Outer reef, Hitaddu, Addu Atoll; X2:51-2, Northern reef flat, Addu Atoll; X2:88-37, 88-53, 88-54, and 88-55, Lagoon, Rasdu Atoll; X2:97-8 and 97-9, Patch reef, Gaha Faro.

Distribution: Red Sea eastward to Tuamotu Archipelago.

Favia pallida (DANA), 1846

Favia doreyensis	MATTHAI, 1914, p.84; pl.9, figs. 1, 3; pl.22, figs. 8, 9; pl.32, figs. 2–4; (synonymy).
Favia pallida	WELLS, 1954, p.457; pl.173, figs. 1–4; pl.174, fig.1. NEMENZO, 1959, p.89; pl.5, fig.2.

There are 21 specimens of this species in the present collection. MATTHAI (1914) considered *F. hululensis* GARDINER as distinct species from *F. doreyensis* (= *F. pallida*). However, VAUGHAN (1918) thought that *F. hululensis* is the same as *F. pallida*. But recently WELLS & DAVIES (1966), WIJSMAN-BEST (1971), and CHEVALIER (1972) list *hululensis* separate from *F. pallida*. PILLAI (1972) followed VAUGHAN (1918) in treating *hululensis* with *pallida*, after a study of this species in the field. *F. hululensis* can very well fall within the skeletal variation of *F. pallida*, though it might be possible to separate them on odd specimens. Gradation from one to the other can be demonstrated in a large suit of

specimens. We treat them together under DANA's specific name with the remark that five of our specimens agree in most respects to MATTHAI's (1914) description of *F. hululensis*.

Material examined:

Forma *hululensis:* X2:34-3, Outer reef, Hitaddu, Addu Atoll; X2:81-1, X2:83-10, 83-12, Inner reef, Weligandu, Rasdu Atoll; X2:90-1, Outer reef, Weligandu, Rasdu Atoll.

Forma *pallida:* X2:18-5, 18-30, Inner reef, Hitaddu, Addu Atoll; X2:20-5, 20-18, Inner reef, Abuhera, Addu Atoll; X2:Sch-17, X2:35-3, Xarifa Reef, Addu Atoll; X2:41-7, Patch reef, Addu Atoll; X2:50-10, 50-16, X2:51-3, 51-5, Northern reef flat, Addu Atoll; X2:67-3, Faro, Ari Atoll; X2:83-2, 83-11, Inner reef, Weligandu, Rasdu Atoll; X2:88-16, Lagoon, Rasdu Atoll; X2:97-18, Patch reef, Gaha Faro.

Distribution: Western Indian Ocean eastward to Samoa.

Favia favus (FORSKAL), 1775

Favia favus	MATTHAI, 1914, p.79; pl.9, fig.2; pl.20, figs. 1–6; pl. 21, figs. 1–3 and 5–8; pl. 22, figs. 1–5; pl. 32, fig. 1; pl. 36, figs. 1, 2; (synonymy).

For further literature see SCHEER & PILLAI (1974).

X2:31-17 is a subhemispherical corallum found attached to a sunken ship. The corallites are with distinct rims projecting to 2 mm. Calices oval or slightly distorted, up to 15 mm in diameter, 8 to 10 mm deep. Septa up to 45. X2:18-29 is a small corallum attached to a dead branch of Acropora. The calices are 9 to 10 mm in diameter and are up to 7 mm in depth. In a third specimen the calices are elongated and are 11 mm in length and only 3 to 4 mm in depth. Septa about 40. Corallites level with the intercorallite walls thickened to 3 mm.

Material examined: X2:18-29, Inner reef, Hitaddu, Addu Atoll; X2:31-17, Wreck, Addu Atoll; X2:88-36, Lagoon, Rasdu Atoll.

Distribution: Red Sea; and then eastward to Tuamotu Archipelago (CHEVALIER et al., 1968).

Favia valenciennesii (MILNE EDWARDS & HAIME), 1848, 1849

Favia bertholleti	MATTHAI, 1914, p.94; pl.7, fig.2; pl.22, fig.7; pl.23, figs. 4, 6; pl.24, fig.1. (synonymy).
Favia valenciennesii	WELLS, 1954, p.458.
	STEPHENSON & WELLS, 1956, p.31.
	NEMENZO, 1959, p.89; pl.5, fig.1.
Plesiastrea valenciennesii	ROSEN, 1968, p. 340; pl. 4, figs. 1–3.

For further literature and synonymy see SCHEER & PILLAI (1974).

Material examined: X2:100-1, 100-2, Inner reef, Madewaru, Fadiffolu Atoll.

Distribution: Red Sea eastward to Marshall Islands and New Caledonia (CHEVALIER, 1971).

Genus *Favites* LINK, 1807

Favites abdita (ELLIS & SOLANDER), 1786

Favia abdita	MATTHAI, 1914, p.91; pl.9, fig.5; pl.29, figs. 1–4; pl.35, fig.2; (synonymy).
Favites abdita	VAUGHAN, 1918, p.109; pl.40, figs.1–5.

For subsequent literature see SCHEER & PILLAI (1974).

There are 11 specimens of this species in the present collection. The major skeletal variations observed in the present suite of specimens are in the thickness of the intercorallite walls and the degree of spinulations. In some specimens the walls are up to 3 mm in thickness with a faint groove as in *F. halicora*. The paliform lobes are either thin or thickened. The corallites also show a wide range of variation in their depth being superficial to 6 or 7 mm. All the specimens in the collection show the typical hillocky growth of the species.

Material examined: X2:17-12, 17-22, X2:18-2, Inner reef, Hitaddu, Addu Atoll; X2:35-9, Xarifa Reef, Addu Atoll; X2:50-6, Northern reef flat, Addu Atoll; X2:90-24, 90-33, Outer reef, Weligandu, Rasdu Atoll; X2:97-1, 97-4, 97-6 and 97-26, Patch reef, Gaha Faro.

Distribution: Red Sea, along the eastcoast of Africa and then eastward to Fiji.

Favites halicora (EHRENBERG), 1834

Favia halicora	MATTHAI, 1914, p.106; pl.26, figs. 3, 5–7; (synonymy).
	MATTHAI, 1924, p.17; pl.1, figs. 4, 6.
Favites halicora	VAUGHAN, 1918, p.110; pl.41, figs. 1–3.
	HOFFMEISTER, 1925, p.25.
	FAUSTINO, 1927, p.136; pl.29, fig.3.
	UMBGROVE, 1940, p.280; pl.24, figs. 6, 7, 8.
	CROSSLAND, 1952, p.128.
	NEMENZO, 1959, p.96.

Material examined: X2:31-6, Wreck, Addu Atoll.

Distribution: Red Sea eastward to Samoa and Fanning Island. For specific geographic areas reference may be made to SCHEER & PILLAI (1974).

Favites ehrenbergi (KLUNZINGER), 1879

Favia ehrenbergi	(part) KLUNZINGER, 1879b, p.29; pl.3, fig.7.
Favia versipora	(non LAMARCK) GARDINER, 1904, p.766.
Favia favus	(part) MATTHAI, 1914, p.82; pl.21, fig.4.
Favia ehrenbergi	YABE, SUGIYAMA & EGUCHI, 1936, p.30; pl.20, figs. 3–5.

The present specimen matches well with KLUNZINGER's figure of this species (cited above). The corallum is massive with a greater diameter of 7 cm. Corallites polygonal, 8 to 9 mm long, 5 to 6 mm broad and 4 to 5 mm deep. Wall fused, 1 to 1.5 mm thick. Septa 22 to 28, alternating in size, continuous over the wall. 10 to 14 septa reach the columella. Septal teeth secondarily frosted. There are 4 to 6 teeth on a major septum. The corallum has a rough appearance.

Material examined: X2:83-6, Inner reef, Weligandu, Rasdu Atoll.

Distribution: Red Sea; Maldives; Minicoy; Marshall Islands.

Favites virens (DANA), 1846

(Plate 24, Fig. 3)

Favia vasta	MATTHAI, 1914, p.108; pl.27, figs. 3, 5, 6; (synonymy).
Favites virens	VAUGHAN, 1918, p.111; pl.41, figs. 4, 5.
	YABE, SUGIYAMA & EGUCHI, 1936, p.33; pl.19, figs. 8, 9.
	UMBGROVE, 1939, p.29.
	UMBGROVE, 1940, p.279.
	CROSSLAND, 1952, p.130; pl.6, figs. 1, 2.
	WELLS, 1954, p.459.
	STEPHENSON & WELLS, 1956, p.33.
	NEMENZO, 1959, p.93.

We refer one specimen to this species. The corallites are polygonal with fused walls. Larger calices average 18 mm in length, 12 to 14 mm in breadth and 10 to 11 mm in depth. Thickness of the wall 1 to 1.5 mm. Total number of septa nearly 45, of which half reach the columella. Septal teeth sharp, the paliform lobes are not well demarcated from the lower teeth. Columella oval or elongated, trabecular.

Material examined: X2:41-4, Patch reef, Addu Atoll.

Distribution: Red Sea; Aldabra; Chagos; Maldives; Gulf of Mannar and Palk Bay (PILLAI, 1971a); East Indies; Philippines; Great Barrier Reef; Japan; Palau Islands; Marshall Islands; New Caledonia (WIJSMAN-BEST, 1972).

Favites flexuosa (DANA), 1846

(Plate 25, Fig. 1, 2; Plate 26, Fig. 1)

Favites flexuosa	YABE, SUGIYAMA & EGUCHI, 1936, p.32; pl.20, fig.1; (synonymy).
	UMBGROVE, 1939, p.29.
	WELLS, 1954, p.459; pl.175, figs. 1, 2.
	NEMENZO, 1959, p.95.
	CHEVALIER, 1971, p. 219; pl. 21, figs. 4,5; pl. 22, figs. 2, 5, 6; pl. 23, fig. 9; pl. 26; pl. 27, figs. 1.

Five specimens in the present collection probably belong to this species. They are encrusting with corallites ranging from 20 to 25 mm in length and 12 to 16 mm in breadth. In one specimen (X2:31-19) one of the corallites is 39 mm in length, 22 mm in breadth and 14 mm in depth. This specimen is further interesting since the first two cycles of septa are up to 5 mm broad at the thecal wall with entire edges. Generally the corallites are polygonal with fused walls up to 6 mm in thickness. But in two specimens (X2:63-3 and 63-4) the corallites are rounded and wide apart. The walls are a little elevated. Intercorallite areas 4 to 6 mm broad. Diameter of calices 15 to 18 mm, depth 4 to 5 mm. Septa exsert in all the five specimens, continuous over the wall when the latter is fused or stopping at the middle of the intercorallite wall when the corallites are rounded and wall not fused. Septa vary from 40 to 45. Columella rounded, trabecular.

Material examined: X2:31-19, Wreck, Addu Atoll; X2:50-4, 50-9, Northern reef flat, Addu Atoll; X2:63-3 and 63-4, Fulu, Suvadiva Atoll.

Distribution: Maldives; Nicobars; East Indies; Palau Islands; Marshall Islands; New Caledonia (CHEVALIER, 1971); Fiji; Cook Islands (STODDART & PILLAI, 1973).

Favites melicerum (EHRENBERG), 1834

(Plate 27, Figs. 1, 2)

Astraea Melicerum	EHRENBERG, 1834, p. 320.
Favia pentagona	(non ESPER) MATTHAI, 1914, p. 95; pl. 10, fig. 5; pl. 24, figs. 2–4; pl. 36, fig. 4.
Favites melicerum	VAUGHAN, 1918, p. 112; pl. 41, figs. 6, 6a; (synonymy).
	WIJSMAN-BEST, 1972, p. 29; pl. 5, fig. 3.

MATTHAI (1914) adopted the specific name *pentagona* for this species which according to VAUGHAN (1918) is not available, hence the specific name *melicerum* should be used. MATTHAI (1924) did not pay much attention to VAUGHAN's suggestion and reverted to *pentagona* remarking: "the specific characters of ESPER's species cannot be definitely settled till the type-specimen has been re-examined". However, the specific name *pentagona* was used by VAUGHAN (1918) and subsequent authors like YABE, SUGIYAMA & EGUCHI (1936) and UMBGROVE (1939) for a different species, to which *Astrea deformis* LAMARCK is a synonym. To avoid further confusion we are following VAUGHAN in naming the species.

The four specimens before us display a lot of variation among themselves, warranting separate notes.

X2:61-2 is part of a massive, columniform corallum. The corallites are polygonal, mostly pentagonal, about 5 mm in length and 2 to 3 mm in depth. The walls are fused, about 1 mm thick. Septa 24 to 28 of which 12 to 14 reach the columella. Septa a little exsert, edges dentate.

Two other specimens (X2:18-15 and 61-3) are also massive. The corallite walls are up to 2 mm thick. Septa 20 to 30, all exsert. Paliform lobes (8 to 10) well formed. These specimens differ from X2:61-2 in their more thickened wall, more exsert septa and better developed paliform lobes. The fourth specimen is only a fragment and in general characters agrees to X2:61-2.

Material examined: X2:18-15, Inner reef, Hitaddu Addu Atoll; X2:61-2 and 61-3, Wreck, Gan, Suvadiva Atoll; X2:90-19, Outer reef, Weligandu, Rasdu Atoll.

Distribution: Red Sea; Providence Island; Seychelles; Maldives; Minicoy, Mandapam (PILLAI, 1971b); Arracan; Mergui Archipelago; Cocos-Keeling Islands; New Caledonia (WIJSMAN-BEST, 1972).

Genus *Goniastrea* MILNE EDWARDS & HAIME, 1848

Goniastrea pectinata (EHRENBERG), 1834

Goniastrea pectinata	MATTHAI, 1914, p.120; pl.28, fig.6; pl.37, fig.1; (synonymy).
	CROSSLAND, 1952, p.135 (synonymy).
	STEPHENSON & WELLS, 1956, p.34.
	NEMENZO, 1959, p.99.
Goniastrea planulata	MATTHAI, 1914, p.121; pl.28, fig.5; pl.31, figs. 7, 8; (synonymy).
	NEMENZO, 1959, p.102; pl.10, fig.2.
Goniastrea mantonae	CROSSLAND, 1952, p.136; pl.7, figs. 1, 2.
	NEMENZO, 1959, p.101; pl.9, fig.2.
Goniastrea equisepta	NEMENZO, 1959, p.101; pl.10, fig.1.

The five specimens in the present collection agree to MATTHAI's (1914) description of *G. planulata*. Four of the specimens are encrusting with thick (2 mm) intercorallite walls, while the fifth is a foliaceous corallum with a greater diameter of 23 cm. In this foliaceous corallum the corallites are up to 10 mm in length and are only 3 mm in depth. The paliform lobes are not well demarcated from the lower septal teeth.

Material examined: X2:47-2, Northern outer reef, Addu Atoll; X2:57-2, Inner reef, Gan, Addu Atoll; X2:76-9, 76-12, Great Faro, Ari Atoll; X2:90-13, Outer reef, Weligandu, Rasdu Atoll.

Distribution: Red Sea eastward to Samoa.

Goniastrea retiformis (LAMARCK), 1816

For literature and synonymy see SCHEER & PILLAI (1974).

We follow CROSSLAND (1952) in considering *G. solida* (= *G. parvistella*) as a variety of *G. retiformis*. The present collection includes 18 specimens of this species. In some specimens the calices are up to 5 mm in length, slightly larger than in the typical forms. But the septal numbers show no corresponding increase. A detailed description of the specimens is not necessary.

Material examined: X2:18-16, 18-25, Inner reef, Hitaddu, Addu Atoll; X2:31-11, Wreck, Addu Atoll; X2:Sch-5, Sch-6, Sch-12, X2:35-7, 35-10, 35-11, Xarifa Reef, Addu Atoll; X2:49-4, X2:50-8, Northern reef flat, Addu Atoll; X2:73-2, 73-4, X2:75-3, Great Faro, Ari Atoll; X2:81-12, Inner reef, Weligandu, Rasdu Atoll; X2:90-2, 90-16, Outer reef, Weligandu, Rasdu Atoll; X2:100-17, Inner reef, Madewaru, Fadiffolu Atoll.

Distribution: Red Sea eastward to Samoa.

Genus *Platygyra* EHRENBERG, 1834

Platygyra lamellina EHRENBERG, 1834

Platygyra lamellina	STEPHENSON & WELLS, 1956, p.35 (synonymy).
Platygyra daedalea	NEMENZO, 1959, p.107; pl.13, fig.1.
Platygyra exigua	NEMENZO, 1959, p.108; pl.13, fig.2.
Platygyra rustica	EGUCHI, 1968, p.C22.

For further literature and synonymy see SCHEER & PILLAI (1974).

Material examined:

Forma *astraeiformis:* X2:Sch-18, X2:35-12, Xarifa Reef, Addu Atoll; X2:75-4, 75-9, X2:76-10, Great Faro, Ari Atoll; X2:97-19, 97-20, Patch reef, Gaha Faro.

Forma *daedalea:* X2:20-3, Inner reef, Abuhera, Addu Atoll; X2:31-15, Wreck, Addu Atoll; X2:34-8, Inner reef, Hitaddu, Addu Atoll; X2: Sch-13, Sch-14, Xarifa reef, Addu Atoll; X2:90-11, 90-15, and 90-34, Outer reef, Weligandu, Rasdu Atoll; X2:200-7, Outer reef, Malos, Ari Atoll.

Distribution: Red Sea eastward to Tuamotu Archipelago (CHEVALIER et al., 1968).

Genus *Oulophyllia* MILNE EDWARDS & HAIME, 1848

Oulophyllia crispa (LAMARCK), 1816

Oulophyllia crispa	MATTHAI, 1928, p.257; pl.19, figs. 1–2; pl.25, fig.2; pl.71, figs.1, 3; (synonymy).
	YABE, SUGIYAMA & EGUCHI, 1936, p.42; pl.25, fig.6; pl.34, fig.4.
	CROSSLAND, 1952, p.147.
	WELLS, 1954, p.461.
	SCHEER, 1964a, p.618, fig.9.
	WIJSMAN-BEST, 1972, p.49; pl.11, fig.4.
Coeloria cooperi	GARDINER, 1904, p.762; pl.60, fig.9.

Three specimens are referred to this species. In X2:Sch-10 the valleys are 12 to 16 mm in width and 12 to 13 mm in depth. There are 10 to 12 septa per cm length of collins. Septal teeth become larger towards the lower parts of the septa.

Columella poorly developed. A second specimen has very lengthy valleys extending from edge to edge of the corallum with well developed columella. The adjacent columella centres are linked by thin lamellae, though they are not thickened as in *O. aspera*. A third specimen (X2:49-3) has narrower valleys that are only 10 mm in width. The columella is not well differentiated. It grades towards *Platygyra*.

Material examined: X2:Sch-10, Xarifa Reef, Addu Atoll; X2:49-3, X2:50-11, Northern reef flat, Addu Atoll.

Distribution: Red Sea; Gulf of Aden; Zanzibar; Seychelles; Maldives; Singapore; Great Barrier Reef; Palau Islands; Caroline Islands; Marshall Islands; New Caledonia (WIJSMAN-BEST, 1972).

Genus *Leptoria* MILNE EDWARDS & HAIME, 1848

Leptoria phrygia (ELLIS & SOLANDER), 1786

Platygyra phrygia	MATTHAI, 1928, p.112; pl.1, fig.3; pl.10, figs.5–7, 9; pl.11, figs.5–6; pl.12, figs.3, 6; pl.49, figs.1, 2; pl.50, fig.1; pl.65, fig.4; (synonymy).
	EGUCHI, 1968, p.C 23.
Leptoria phrygia	STEPHENSON & WELLS, 1956, p.37.
	PILLAI & SCHEER, 1973, p.473.

Material examined: X2:17-7, Inner reef, Hitaddu, Addu Atoll; X2:20-13 and 20-17, Inner reef, Abuhera, Addu Atoll; X2:39-10, Mini Atoll, Addu Atoll; X2:51-11, Northern reef flat, Addu Atoll; X2:68-2, Faro, Ari Atoll.

Distribution: Red Sea eastward to Samoa.

Genus *Hydnophora* FISCHER DE WALDHEIM, 1807

Hydnophora grandis GARDINER, 1904

Hydnophora grandis	GARDINER, 1904, p.764; pl.60, fig.11.
	MATTHAI, 1928, p.150; pl.2, figs.10–13; pl.47, fig.3.
	YABE, SUGIYAMA & EGUCHI, 1936, p.40; pl. 30, figs.3–4.
	UMBGROVE, 1939, p.34.

One specimen in the present collection agrees well with the original description of this species. It is explanate with a greater diameter of 24 cm. At the upper side there is a small hillocky growth. The monticules are conical, pointed at the top, but swollen at the base to 7 mm. There are 10 to 15 septa in an average sized monticule. Septa very narrow at the side of the monticule, septal edges serrated. Columella obsolete.

Material examined: X2:65-1, Faro, Ari Atoll.

Distribution: Maldives; East Indies; Japan.

Remarks: The present species differs from *H. exesa* in its swollen monticules with comparatively smaller number of septa and poorly developed or even absent columella. Further the coenosteum is highly vascular.

Hydnophora exesa (PALLAS), 1766

Hydnophora exesa	MATTHAI, 1928, p. 140, pl. 14, fig. 5; pl. 15, figs. 1, 2; pl. 16, figs. 1–4; pl. 17, fig. 3; (synonymy).
	YABE, SUGIYAMA & EGUCHI, 1936, p. 39, pl. 25, fig. 7; pl. 29, fig. 2; pl. 30, fig. 2.
	NEMENZO, 1959, p. 103, pl. 11, fig. 1.
	WIJSMANN-BEST, 1972, p. 51; pl. 13, figs. 1–4.

Material examined: X2:49–1, 49–2, Northern reef flat, Addu Atoll; X2:83–3, Inner reef, Weligandu, Rasdu Atoll.

Distribution: Red Sea eastward to Cook Islands (STODDART & PILLAI, 1973).

Hydnophora microconos (LAMARCK), 1816

Hydnophora microconos
MATTHAI, 1928, p. 144; pl. 2, figs. 8, 9; pl. 16, figs. 5–9; pl. 17, figs. 1, 2, 4–6; pl. 49, fig. 5; (synonymy).
YABE, SUGIYAMA & EGUCHI, 1936, p. 40; pl. 32, fig. 5.
UMBGROVE, 1939, p. 34.
UMBGROVE, 1940, p. 284.
CROSSLAND, 1952, p. 151.
WELLS, 1954, p. 462.
NEMENZO, 1959, p. 104; pl. 11, fig. 2.

Two specimens in the present collection are typical of the species. They show no noteworthy variation from MATTHAI's (1928) description.

Material examined: X2:90–3 and 90–35, Outer reef, Weligandu, Rasdu Atoll.

Distribution: Red Sea eastward to Samoa and Cook Islands (STODDART & PILLAI, 1973).

Subfamily Montastreinae VAUGHAN & WELLS, 1943

Genus *Diploastrea* MATTHAI, 1914

Diploastrea heliopora (LAMARCK), 1816

Diploastrea heliopora
MATTHAI, 1914, p. 72; pl. 20, figs. 7, 8; pl. 34, fig. 9; (synonymy).
See SCHEER & PILLAI (1974) for further literature.

Material examined: X2:83–8, Inner reef, Weligandu, Rasdu Atoll; X2:97–10, Patch reef, Gaha Faro.

Distribution: Red Sea eastward to Fiji and Samoa, but not in Palk Bay and Gulf of Mannar along the Indian coast.

Genus *Leptastrea* MILNE EDWARDS & HAIME, 1848

Leptastrea transversa KLUNZINGER, 1879

Leptastrea transversa
KLUNZINGER, 1879b, p. 46; pl. 6, fig. 2.
VAUGHAN, 1918, p. 94; pl. 31, figs. 1, 1a.
CROSSLAND, 1952, p. 115, pl. 54, figs. 1–3.
SCHEER, 1964, p. 461.

Leptastrea roissyana
MATTHAI, 1914, p. 67, pl. 8, figs. 1–3; pl. 17, fig. 4; pl. 18, fig. 1; pl. 19, figs. 1, 2; pl. 37, fig. 4; (synonymy).
MATTHAI, 1924, p. 9.

We refer two specimens to this species. One of them is an encrustation on a gastropod (*Lambis*) shell. The calicular characters are as given by KLUNZINGER.

Material examined: X2:16–10, Addu Atoll; X2:90–4, Outer reef, Weligandu, Rasdu Atoll.

Distribution: Red Sea; Chagos; Maldives; Ceylon; Palk Bay and Gulf of Mannar along the Indian coast; Nicobars; Mergui Archipelago; Strait of Malacca (PILLAI & SCHEER, 1974); Great Barrier Reef; Cook Islands; Fanning Islands.

Genus *Cyphastrea* MILNE EDWARDS & HAIME, 1848

Cyphastrea microphthalma (LAMARCK), 1816

Cyphastrea microphthalma
MATTHAI, 1914, p. 43; pl. 7, fig. 6; pl. 12, figs. 4–9; pl. 13, figs. 1, 2, 7; pl. 34, fig. 4; (synonymy).
VAUGHAN, 1918, p. 88; pl. 29, figs. 1, 1a.
HOFFMEISTER, 1925, p. 19.

FAUSTINO, 1927, p. 115; pl. 16, figs. 1, 2.
YABE & SUGIYAMA & EGUCHI, 1936, p. 23; pl. 17, figs. 7, 8.
UMBGROVE, 1939, p. 25.
UMBGROVE, 1940, p. 276.
CROSSLAND, 1941, p. 46.
NEMENZO, 1959, p. 113.

We have three specimens before us. In one of them (X2:67–4) the septal plan is regular, i. e. there are 29 septa of which 10 meet the columella. In the second specimen, however, there are 16 to 20 septa in different calices of which half the number joining the columella. Coenosteum in both the specimens is solid.

Material examined: X2:17–28 (2) attached to *Acropora palifera* X2:17–28 (1), Inner reef, Hitaddu, Addu Atoll; X2:67,4, 67–5, Faro, Ari Atoll.

Distribution: Red Sea eastward to Tahiti.

Cyphastrea chalcidicum (FORSKAL), 1775

Cyphastrea chalcidicum MATTHAI, 1914, p. 41; pl. 7, figs. 1, 5; pl. 12, figs. 1–3; pl. 14, fig. 1; (synonymy).
WELLS, 1954, p. 464.

One small club-shaped specimen belongs to this species. The first two cycles of septa are of equal thickness as well as the costae. The corallites are level. The corallum was free at the time of collection. This species has a habit of getting attached to dead branches of arborescent reef corals, later getting detached by the breakage of the substratum and thus lying free on the reef.

Material examined: X2:16–15, Addu Atoll.

Distribution: Red Sea eastward to Marshall Islands.

Genus *Echinopora* LAMARCK, 1816

Echinopora lamellosa (ESPER), 1797

Echinopora lamellosa MATTHAI, 1914, p. 50; pl. 8, fig. 6; pl. 14, figs. 2–6; pl. 15, fig. 1; pl. 16, fig. 6; (synonymy).

See SCHEER & PILLAI (1974) for further literature and synonymy.

We have a good suite of specimens before us. Most of them are parts of folia showing buds at the under side (BOSCHMA, 1928). Three of our specimens display a peculiar growth-form hitherto undescribed. They are thick branching folia resembling foliaceous *Pavona* with corallites on either side. Thickness of the folia up to 18 mm. They are 4 to 5 cm broad. The corallites are projecting to 3 mm. This unusual form seems to have attained by the overgrowth of coenenchyme on broken off pieces from the usual foliaceous coralla.

Material examined: X2:16–17, 16–20, Addu Atoll; X2:17–2, X2:18–1, 18–27, Inner reef, Hitaddu, Addu Atoll; X2:20–8, Inner reef, Abuhera, Addu Atoll; X2:43–8, Outer reef, Hitaddu Addu Atoll; X2: 57–8, Inner reef, Gan, Addu Atoll; X2:81–2, 81–4, Inner reef, Weligandu, Rasdu Atoll; X2:90–20, Outer reef, Weligandu, Rasdu Atoll; X2:97-25, Patch reef, Gaha Faro; X2:100–6, X2:104–9, Inner reef, Madewaru, Fadiffolu Atoll.

Distribution: Western Indian Ocean eastward to Fiji.

Echinopora hirsutissima MILNE EDWARDS & HAIME, 1850

(Plate 27, Fig. 2)

Echinopora hirsutissima MATTHAI, 1914, p. 51; pl. 8, fig. 5; pl. 9, fig. 4; pl. 14, figs. 7, 8; pl. 15, figs. 2–4; pl. 17, fig. 1; pl. 34, fig. 7; (synonymy).
PILLAI et al. 1973, p. 461, pl. 3, fig. 2.

Corallum explanate, growing edges 3 mm thick, getting thicker to the central part to 3 cm. An epitheca is visible at the under side. Corallites rounded, about 5 mm in diameter, close together or up to 3 mm apart. Septa in four cycles, the fourth rudimentary, the cycle incomplete. Up to 29 septa reach the columella. Septa exsert to about 1 mm, the exsert part with a notch, the upper part of the notch standing vertical. There are 10 to 12 vertical pali around the columella. The septum is perforate behind the palus. Costae with one or two secondarily frosted spines. Columella rounded or oval, formed of twisted trabeculae.

Material examined: X2:76–11, Great Faro, Ari Atoll; X2:100–9 and 100–15, Inner reef, Madewaru, Fadiffolu Atoll.

Distribution: Chagos; Seychelles; Réunion Island; Maldives.

b) Family **Oculinidae** GRAY, 1847
Subfamily Galaxeinae VAUGHAN & WELLS, 1943

Genus *Galaxea* OKEN, 1815

Galaxea fascicularis (LINNE), 1767

Galaxea fascicularis	MATTHAI, 1914, p. 59; pl. 8, fig. 4; pl. 16, fig. 4; pl. 34, fig. 3; pl. 38, fig. 6; (synonymy).
	CHEVALIER, 1971, p. 58; pl. 4, figs. 2, 7; pl. 5, figs. 1-4; pl. 6, figs. 3, 8; pl. 7, figs. 1, 2; pl. 8, figs. 1–6; (synonymy).
	PILLAI & SCHEER, 1973, p. 473.
Galaxea lawisiana	NEMENZO, 1959, p. 80; pl. 2, fig. 1.

We refer ten specimens to this species. Three of them agree with KLUNZINGER's (1879a) description of *G. irregularis*, which MATTHAI considered as synonymous with *G. fascicularis*. A few of our specimens have corallites smaller than the usual and resemble *G. clavus*, but the corallites are broader at the top than at the base. The columella is also poorly developed. The relationship of *G. clavus* and *G. fascicularis* needs further studies.

Material examined: X2:18–10, 18–20, Inner reef, Hitaddu, Addu Atoll; X2:20–1, 20–2, Inner reef, Abuhera, Addu Atoll; X2:39–9, Mini Atoll, Addu Atoll; X2: Sch–3, Xarifa Reef, Addu Atoll; X2:90–7, 90–23, 90–25 and 90–31, Outer reef, Weligandu, Rasdu Atoll.

Distribution: Red Sea eastward to Samoa.

Galaxea lamarcki MILNE EDWARDS & HAIME, 1851

Galaxea lamarcki	MATTHAI, 1914, p. 64; pl. 13, fig. 6; pl. 16, fig. 1; pl. 34, fig. 2; (synonymy).
	CHEVALIER, 1971, p. 75, pl. 1, fig. 5; pl. 4, fig. 3; pl. 5, figs. 5–6; pl. 6, fig. 1; pl. 7, figs. 3–6, 8.

A small specimen (3 x 4 cm in spread) is explanate with a narrow base of attachment at the under side followed by a wrinkled epitheca. The peritheca is highly vesicular. The corallites are small, generally 3 mm in diameter, about 1.5 mm exsert. Wall cylindrical of equal diameter from top to bottom. Distance between adjacent corallites 3 to 4 mm. Septa in three cycles. The primaries about 1 mm exsert, exsert part vertical. All the primary septa join the columella. Secondaries and tertiaries do not reach the columella. Septa edges and sides granular. Columella small but distinct.

The present specimen agrees to MATTHAI's description of this species. It may be pointed out that our specimen is a young corallum which has not fully developed. It differs from *G. clavus* in its uniformly thick and shorter corallites with poorly developed septa.

Material examined: X2:88–41, Lagoon bottom, Rasdu Atoll.

Distribution: Red Sea; Saya de Malha Bank; Chagos; Maldives; New Caledonia (CHEVALIER, 1971).

c) Family **Merulinidae** VERRILL, 1866

Genus *Merulina* EHRENBERG, 1834

Merulina ampliata (ELLIS & SOLANDER), 1786

Merulina ampliata	MATTHAI, 1928, p. 127; pl. 1, figs. 4–6; pl. 13, figs. 1–8; pl. 59, figs. 3, 4; pl. 67, fig. 3; (synonymy).
	THIEL, 1932, p. 58: pl. 7, figs. 1, 2, 3a–3e.
	YABE, SUGIYAMA & EGUCHI, 1936, p. 41, pl. 29, fig. 3; pl. 51, fig. 6.
	CROSSLAND, 1952, p. 151
	STEPHENSON & WELLS, 1956, p. 41.
	SEARLE, 1956, p. 22, pl. 31, fig. B.
	NEMENZO, 1959, p. 126, pl. 21, fig. 1; pl. 22, figs. 1, 2 (including *M. vaughani*).

Material examined: X2:29–3, 29–5, Xarifa Reef, Addu Atoll; X2:51–6, 51–7 and 51–8, Northern reef flat, Addu Atoll.

Distribution: Red Sea; Madagascar; Seychelles; Maldives; Minicoy; Gulf of Mannar; Mergui Archipelago; Singapore; Java; Philippines; Amboina; Great Barrier Reef; Ryukyu Islands; Kyushu; Daito Islands; Bonin Islands; Marshall Islands; Palau Islands; Solomon Islands; Samoa.

d) Family **Mussidae** ORTMANN, 1890

Genus *Cynarina* BRÜGGEMANN, 1877

Cynarina lacrymalis (MILNE EDWARDS & HAIME), 1848

(Plate 28, Figs. 1, 2)

Cynarina lacrymalis	WELLS, 1964, p. 376; pls. 20, 21; pl. 23, fig. 4; (synonymy).
Sclerophyllia margariticola	KLUNZINGER, 1879b, p. 4; pl. 1, fig. 12.
Rhodocyathus ceylonensis	BOURNE, 1905, p. 191; pl. 1, figs. 1, 1a.
Protolobophyllia japonica	YABE, SUGIYAMA & EGUCHI, 1936, p. 45; pl. 16, figs. 8, 8a, 9, 9a.

WELLS & DAVIES (1966) have already mentioned the occurrence of this species in Maldives. We have two specimens of this solitary mussid before us. Both were found growing on a sunken ship. The smaller (X2:31–28) has a greater diameter of 4 cm when measured from the outer edges of the exsert septa. The larger is 6.5 cm in diameter. Both are turbinate with rounded calices. The larger specimen has 88 septa, while the smaller has 54 septa. The first two cycles of septa are the broadest with well developed pali. The third cycle of septa also has pali but smaller. The edges of the major septa are entire (in the larger specimen only the primaries have entire edges). Septa exsert up to 12 mm, exsert part arched, arched portions with teeth. Costae correspond to septa. Columella well developed, composed of closely twisted trabeculae.

Material examined: X2:31–28, 31–30, Wreck, Addu Atoll.

Distribution: Red Sea; French Somaliland (GRAVIER, 1911); Maldives; Ceylon; Borneo; Macclesfield Bank, China Sea (BASSETT-SMITH, 1890); Great Barrier Reef (CROSSLAND, 1952); New Caledonia; Japan; Loyalty Islands.

Genus *Parascolymia* WELLS, 1964

Parascolymia vitiensis (BRÜGGEMANN), 1877

(Plate 28, Figs. 3, 4)

Parascolymia vitiensis	WELLS, 1964, p. 379; pl. 22; pl. 23, figs. 1–3; (synonymy).

The occurrence of this solitary mussid in the Maldives has been already noted by SCHEER (1971). There are six specimens in the present collection. Five of them were collected from the same spot where *Cynarina lacrymalis* was

found. The smallest specimen (X2:88–59) has a greater diameter of 4 cm with a calicular depth of 12 mm. An epitheca is present. The septa of the first cycle are the largest. There are four teeth within the calyx and another four on the exsert arched portion. In this specimen there is only one columella centre of trabecular nature. Another four specimens (X2:31–25(1–3) and 31–16) have turbinate coralla with broad base of attachment. They vary from 5 to 8 cm in diameters. The calices are shallow or up to 12 mm deep. The largest has 140 septa. In all the specimens the septal teeth are very sharp, 2 to 4 mm long and are found throughout the length of the septa. All the four specimens have secondary columella centres linked by toothed lamellae. A sixth specimen (X2:31–18) differs from all the others in the collection by its very deep calyx. The calys is a little elongated and has a length of 8.5 cm and a depth of 3 cm. There are five columella centres, all linked by lamellae. Septal and costal dentition well developed.

Material examined: X2:31–16, 31–18, 31–25(1–3), Wreck, Addu Atoll; X2:88–59, Lagoon bottom, Rasdu Atoll.

Distribution: Maldives; North West Australia; Great Barrier Reef; Solomon Islands; Loyalty Islands; New Caledonia; Fiji.

Genus *Acanthastrea* MILNE EDWARDS & HAIME, 1848

Acanthastrea echinata (DANA), 1846

Favia hirsuta	MATTHAI, 1914, p. 100, pl. 24, figs. 7, 8; (synonymy).
Acanthastrea echinata	VAUGHAN, 1918, p. 125, pl. 50, figs. 2, 2a; pl. 51, figs. 1, 2.
	WELLS, 1954, p. 467, pl. 175, figs. 4, 5; (synonymy).
Favia dipsacea	CROSSLAND, 1948, p. 186, pl. 5.
Acanthastrea hirsuta	GARDINER, 1904, p. 784, pl. 59, fig. 6.

One submassive specimen belongs to this species. The upper surface is convex. The polygonal corallites are 12 to 14 mm in length and up to 10 mm deep. The intercorallite walls are fused and are about 2 mm thick. Septa 36 to 44, swollen at the wall, exsert; exsert part with 2 vertically standing swollen teeth. Septal teeth hollow in section. Columella deep seated, formed of septal fusion.

Material examined: X2:61–1, Wreck, Southern reef flat, Suvadiva Atoll.

Distribution: Red Sea eastward to Tuamotu Archipelago (CHEVALIER et al., 1968). But this species is not so far recorded from the Indian coast.

Genus *Lobophyllia* DE BLAINVILLE, 1830

WELLS & DAVIES (1966) list four species of *Lobophyllia* from Addu Atoll. The present collection contains 29 specimens, all representing a single species as identified below.

Lobophyllia corymbosa (FORSKAL), 1775

Lobophyllia corymbosa	MATTHAI, 1928, p. 210; pl. 24, fig. 5; pl. 25, figs. 5–8; pl. 26, fig. 4; pl. 27, figs. 1, 2; pl. 57, figs. 5, 8; pl. 58, fig. 1; pl. 60, figs. 4, 6; pl. 62, figs. 4, 5; pl. 64, fig. 4; pl. 68, fig. 1; pl. 71, figs. 5–6; (synonymy).

See SCHEER & PILLAI (1974) for further synonymy and literature.

The present specimens, all parts of larger coralla, vary from 4 to 29 cm in height. The largest uninterrupted valley is 6.5 cm long with four columella centres. Majority of the specimens has monostomodaeal corallites. Septa alternating in thickness, larger ones 1 to 1.5 mm thick and 4 mm exsert. The outer tooth on the exsert part is usually the longest and stands vertically. Columella trabecular, when more than one centre present they are linked by lamellae.

Material examined: X2:20–7, 20–11, 20–12, Inner reef, Abuhera, Addu Atoll; X2:35–8, X2:Sch–41, Xarifa Reef, Addu Atoll; X2:39–6, Mini Atoll, Addu Atoll; X2:41–2, 54–1, Patch reefs, Addu Atoll; X2:75–1, 75–2, Great Faro, Ari Atoll; X2:90–21, Outer reef, Weligandu, Rasdu Atoll; X2:97–7, 97–13, 97–14, 97–15, 97–16, 97–17, 97–22, 97–23, 97–28, Patch reef, Gaha Faro.

Distribution: Red Sea eastward to Tuamotu Archipelago.

Genus *Symphyllia* MILNE EDWARDS & HAIME, 1848

Symphyllia radians MILNE EDWARDS & HAIME, 1848

Symphyllia radians — MATTHAI, 1928, p. 231; pl. 31, fig. 3; pl. 33, fig. 1; pl. 54, fig. 7; pl. 58, fig. 4; pl. 71, fig. 2; (synonymy).

For further literature and synonymy see SCHEER & PILLAI (1974).

The present collection includes four specimens of this species. They show no marked difference from the specimens we have described from the Nicobar Islands.

Material examined: X2:39–4, Mini Atoll, Addu Atoll; X2:50–2, Northern reef flat, Addu Atoll; X2:82–3, Inner reef, Weligandu, Rasdu Atoll; X2:88–43, Lagoon, Rasdu Atoll.

Distribution: From the Maldives to Kyushu and Shikoku in the north and Rotuma and Tongatabu in the east.

Symphyllia recta (DANA), 1846

Symphyllia recta — MATTHAI, 1928, p. 227; pl. 30, figs. 1–6; pl. 31, figs. 1–2; pl. 48, figs. 4–6; pl. 57, figs. 1a–1b; (synonymy).

Symphyllia nobilis — WELLS, 1954, p. 466.

Material examined: X2:82–1, Inner reef, Weligandu, Rasdu Atoll; X2:94–1, 94–2, 97–24, Patch reef, Gaha Faro; X2:104–1, X2:105–6, Inner reef, Madewaru, Fadiffolu Atoll.

Distribution: Western Indian Ocean eastward to Samoa.

Symphyllia hassi n. sp.

(Plate 29, Figs. 2, 3)

There is one specimen in the collection which will not fit in with the descriptions of any earlier species. We describe it under a new specific name as follows.

Growth-form as in *S. radians* with a narrow attachment base about 3 cm broad. The corallum gets broadened as it grows upwards. The sides are deeply grooved. Top of the corallum, i. e. the calicinal side is flat. Valleys radiating from the centre to the periphery. Collines flat topped, 15 to 17 mm broad. Distance from top to top of collines 20 to 24 mm. Depth of valleys 5 to 8 mm. A few endothecal vesicles are present. Septa alternating in thickness, generally 7 septa per cm length of colline. Major septa 1 to 1.5 mm thick, subsidiary septa less than 0.5 mm thick. Major septa have 6 to 8 pointed teeth, each about 2 mm long and thick at the base. Septa from opposite sides of the collines stop at the middle of the colline, but not touching each other, so that a narrow space is left in between, giving a grooved appearance to the colline. Septa sloping rather than steeply descending and turn right or left to join the columella. The outstanding feature of the present species is the structure of the columella. The columella is formed of the fused ends of the septa, solid looking, 3 to 4 mm in diameter; distance between adjacent ones about 15 mm. At the peripheral part of the corallum, at the beginning of new valleys a second row of columella is rarely seen. The adjacent columella centres are linked by toothed lamellae. Each lamella has 2 to 3 conical teeth, larger than the septal teeth, 2 to 3 mm high and broad. Around each columella there are about 12 teeth, part from the septa and the rest from the lamellar linkage. These teeth stand very high above the columella and give the appearance of pali. This particular feature is not found in any other species of *Symphyllia* hitherto described.

Material examined: X2:88–6, Lagoon bottom, Rasdu Atoll.

Remarks: *Symphyllia radians, S. valenciennesii* and *S. agaricia* have almost the same growth-form as *S. hassi* n.sp. Out of these, *S. valenciennesii* and *S. agaricia* are characterized by two rows of columella centres in the valleys; the former differing from the latter by the presence of a deep groove on the colline. But none of the earlier species has a solid columella surrounded by paliform lobes. We feel this particular feature alone warrant the separation of *S. hassi* as a new species.

The present species is named in honour of Dr. HANS HASS, the leader of the "Xarifa" Expedition.

e) Family **Pectiniidae** VAUGHAN & WELLS, 1943

Genus *Echinophyllia* KLUNZINGER, 1879

The difference between *Echinophyllia* and *Mycedium* is very slight. According to VAUGHAN & WELLS (1943) both have foliaceous coralla, but *Mycedium* has nariform projecting corallites, the openings of which are directed towards the periphery, while *Echinophyllia* has level corallites, the openings of which are directed upwards. Both the genera may develop into explanate coralla. Regarding the nature of the corallites of the two genera WELLS (1954, p. 468) writes: "This is probably the tropic effect of the variation in the plane of the lamina-parallel centres in horizontal fronds and inclined in vertical folia". It may be noted that it is difficult to separate very young coralla with monostomodaeal corallites. There are several specimens in the present collection, and in fact, we had a lot of practical difficulties in sorting them out. We are not yet sure whether we are dealing with a single species displaying very high skeletal variation or with two genera (*Mycedium* and *Echinophyllia*) as identified in this work. However, we follow the distinction pointed out by VAUGHAN & WELLS in identifying our present suite of specimens. At the same time there are intermediate forms, that can be fit into both the genera.

Echinophyllia aspera (ELLIS & SOLANDER), 1786

(Plate 30, Fig. 1)

Echinophyllia aspera	KLUNZINGER, 1879b, p. 69; pl. 6, fig. 8; (synonymy).
	MATTHAI, 1948, p. 180; pl. 11, figs. 44, 45.
	WELLS, 1954, p. 467; pl. 176; (synonymy).
	PILLAI et al., 1973, p. 462.
Oxyphyllia aspera	YABE, SUGIYAMA & EGUCHI, 1936, p. 50; pl. 36, figs. 1–4.
	UMBGROVE, 1939, p. 40; pl. 10, fig. 1.
Oxypora aspera	CROSSLAND, 1952, p. 159.
Echinopora magna	GARDINER, 1904, p. 782; pl. 60, fig. 10.

The smallest specimen (X2:88-28) in the collection is an entire explanate colony, 6.5 cm in greater spread. It is monostomodaeal with the mother calyx measuring 18 mm in diameter. The major septo-costae are 1 to 2 mm high with large frosted teeth. It is attached to a dead specimen of *Galaxea*, itself being covered over by calcareous algae. X2:57-6 is an entire cup-shaped corallum. It was found mixed with *Mycedium*. A few secondary calices are developed. The rest of the specimens are explanate coralla. The secondary calices are 8 to 10 mm in diameter, level. There are 10 to 15 septa around a calyx. The major septa have two prominent vertical teeth at the exsert part, a feature not conspicuous in *Mycedium*. These teeth are up to 2 mm in height. Septo-costae alternating in size. In one of the specimens (X2:86-1) the septo-costae are discontinuous, i.e. their course is marked only by a row of spines. Columella trabecular, formed of septal fusion, 2 to 3 mm in diameter.

Echinophyllia aspera var. *sugiyamai* YABE & EGUCHI, 1935

(Plate 30, Fig. 2)

Oxyphyllia aspera sugiyamai	YABE, SUGIYAMA & EGUCHI, 1936, p. 51; pl. 38, figs. 5, 6.
	UMBGROVE, 1939, p. 40; pl. 10, fig. 2.

Corallum explanate, thick, edges thinner than at the central part. Corallites projecting, cylindrical, up to 10 mm high. Diameter of calices 10 mm. Adjacent corallites close together, touching or up to 5 mm apart. Septa 15 to 20, exsert at the wall with one or two vertical teeth. Columella trabecular. Costae continuous over the thecal wall, wavy, corresponding to septa, extent from corallite to corallite.

Three specimens are placed under this variety. They differ from typical forms in their highly projecting vertical corallites. Some specimens of *Mycedium* show a similar growth-form. We have (SCHEER & PILLAI, 1974) described such specimens of *M. tubifex* from the Nicobar Islands, but they have nariform corallites at the periphery of the corallum.

Material examined: Typical forms: X2:57-6, Inner reef, Gan, Addu Atoll; X2:86-1, Inner reef, Weligandu, Rasdu Atoll; X2:88-3, 88-28, 88-30, 88-33, Lagoon bottom, Rasdu Atoll.

Var. *sugiyamai:* X2:29-2, Xarifa Reef, Addu Atoll; X2:50-1, 50-7, Northern reef flat, Addu Atoll.

Distribution: Red Sea; Seychelles; Maldives; Mergui Archipelago; East Indies; Formosa; Japan; Marshall Islands; Tahiti.

Genus *Mycedium* OKEN, 1815

Mycedium tubifex (DANA), 1846

(Plate 31, Fig. 2; Plate 32, Fig. 1)

Phyllastraea tubifex	DANA, 1846, p. 270; pl. 16, figs. 4, 4a, 4b.
Mycedium tubifex	WELLS, 1955, p. 16 (synonymy).
	STEPHENSON & WELLS, 1956, p. 44.

For further literature and synonymy see SCHEER & PILLAI (1974).

We are referring 12 specimens to this species. Four of them are entire young, almost funnel-shaped colonies. The rest of the specimens are parts of larger foliaceous coralla. In young coralla a central calyx is visible, around which non-projecting, upwardly directed secondary calices almost radially arranged. At the peripheral part of the corallum they assume a nariform shape. One of our specimens is very interesting (X2:199-1). It has a lower dead layer with nariform corallites over which a fresh growth has taken place with nine corallites. All the nine corallites at the upper layer are level and vertical similar to that of *Echnophyllia.* We do not think a colony of *Echinophyllia* got attached to a dead corallum of *Mycedium* in this particular case, since there seems to be some organic connection. The spines on the septo-costae show considerable degree of variation in development in different coralla. At least in two specimens (X2:88-5 and 88-39) the septo-costae are practically smooth without any spines as in *M. elephantotus.* In others the septo-costae are thickened up to 1.5 mm with frosted granules, while in others they are only 0.5 mm thick with minute sharp spines. In majority of the specimens the coralla are highly vesicular, but in some cases they are solid.

Material examined: X2:46-1, Northern outer reef, Addu Atoll; X2:57-4, Inner reef, Gan, Addu Atoll; X2:Sch-4, Xarifa Reef, Addu Atoll; X2:86-2, Inner reef, Weligandu, Rasdu Atoll; X2:88-1, 88-5, 88-7, 88-39, 88-48, 88-50, 88-51, Lagoon bottom, Rasdu Atoll; X2:199-1, Inner reef, Malos, Ari Atoll.

Distribution: Madagascar; Maldives; Palk Bay (PILLAI, 1971a); Nicobar Islands; Mergui Archipelago; Great Barrier Reef; Palau Islands; Fiji.

Genus *Oxypora* SAVILLE-KENT, 1871

Oxypora lacera (VERRILL), 1864

Oxypora lacera	YABE, SUGIYAMA & EGUCHI, 1936, p. 53, pl. 29, figs. 6, 7; (synonymy).
	UMBGROVE, 1939, p. 41, pl. 12, fig. 1.
	CROSSLAND, 1952, p. 158.
	WELLS, 1954, p. 468, pl. 177, figs. 7, 8.
	NEMENZO, 1959, p. 121, pl. 18, fig. 1.

We have before us only part of a corallum, the basal part of which is dead, the living portion being a fresh overgrowth on the dead layer. The characteristic perforation of the corallum is confined to the growth edge to about 2.5 cm, where no epitheca is visible. It is not clear whether the absence of perforation at the basal part is due to a secondary growth of epitheca that has closed the perforations. Costae with scattered spines. The septo-costae are alternating in thickness, 10 to 14 converge towards the calyx. Columella is solid. Diameter of the calices 7 to 9 mm; young ones 3 to 4 mm.

Material examined: X2:41-5, Patch reef, Addu Atoll.

Distribution: Red Sea; Maldives; Singapore; Amboina; Great Barrier Reef; Japan; Palau Islands; Marshall Islands; Samoa.

Genus *Physophyllia* DUNCAN, 1884

Physophyllia ayleni (WELLS), 1935

(Plate 31, Fig. 1)

Physophyllia ayleni — WELLS, 1935, p. 342; pl. 13; pl. 14, figs. 1–3.
YABE, SUGIYAMA & EGUCHI, 1936, p. 53; pl. 29, fig. 1; pl. 36, fig. 5.

One of us (SCHEER, 1971) has already noted the occurrence of this genus in the Maldivian waters. Only one specimen of this genus was collected during the "Xarifa" Expedition, which is closely related to *Pectinia*. The following are the details of the present specimen.

Corallum foliaceous, edges turning upwards so that it is bowl-shaped. A narrow attachment area is visible. No epitheca at the under side. The lower layer is dead, over which a fresh growth has taken place, so that the corallum is double layered. The calicinal side is highly vesicular. A central calyx is present. It is 17 mm in diameter and 9 mm deep, around which secondary calices are almost radially arranged. The central calyx has 56 septa of which 20 reach a columella. There are two concentric rows of secondary calices. Distance between rows about 20 mm, distance between adjacent corallites within a row 15 mm (i.e. from columella to columella). Depth 5 to 6 mm. Septa 10 to 15, subequal, rarely 2 to 3 are rudimentary. Septo-costae about 0.25 mm thick, subequal, confluent between centres. At the peripheral part of the corallum the septo-costae begin to thicken and alternate in size as in *Mycedium*. Columella trabecular.

Material examined: X2:88-4, Lagoon bottom, Rasdu Atoll.

Distribution: Maldives; Macclesfield Bank, China Sea; Japan.

Remarks: The present specimen was collected from a locality where *Mycedium* and *Echinophyllia* occur. We do not know whether it is an extreme skeletal variation of any other members of *Pectiniidae*. *Physophyllia* is a rare genus. The present specimen agrees to WELLS' description of the type specimen.

Genus *Pectinia* OKEN, 1815

Pectinia lactuca (PALLAS), 1766

Tridacophyllia lactuca — MATTHAI, 1924, p. 36; pl. 3, figs. 8, 9; pl. 8, fig. 6; (synonymy).
Pectinia lactuca — FAUSTINO, 1927, p. 160; pl. 41.
For further literature see SCHEER & PILLAI (1974).

We have discussed elsewhere the relationship of the various "species" of *Pectinia* described in literature, suggesting the possibility that all of them being one and the same. It is not necessary to go into those details here once again which will cause only repetition. The four specimens in the present collection are all parts of large coralla.

Material examined: X2:33-1, 33-2, 33-3, Northern reef flat, Addu Atoll; X2:39-2, Mini Atoll, Addu Atoll.

Distribution: Maldives eastwards to Fiji.

4. Suborder Caryophylliina VAUGHAN & WELLS, 1943
Superfamily Caryophylliicae GRAY, 1847

a) Family **Caryophylliidae** GRAY, 1847
Subfamily *Eusmiliinae* MILNE EDWARDS & HAIME, 1857

Genus *Euphyllia* DANA, 1846

Euphyllia glabrescens (CHAMISSO & EYSENHARDT), 1821

Euphyllia glabrescens — MATTHAI, 1928, p. 174; pl. 3, figs. 17–21; pl. 42, fig. 5; pl. 44, fig. 4; pl. 62, fig. 9; (synonymy).
See SCHEER & PILLAI (1974) for further literature.

Material examined: X2:29-10, Xarifa Reef, Addu Atoll.

Distribution: Western Indian Ocean eastward to Fiji, but does not occur along the Indian coast.

Euphyllia turgida DANA, 1846

Euphyllia turgida

DANA, 1846, p. 166; pl. 9, figs. 9a, 9b.
GARDINER, 1904, p. 759.
MATTHAI, 1924, p. 35.
MATTHAI, 1928, p. 177; pl. 40, fig. 2; pl. 52, fig. 2; pl. 59, fig. 2; (synonymy).

X2:54-2 is part of a corallum with a basal stem bifurcating at the mid height, each division again bifurcating. The corallites are monostomodaeal or distomodaeal, the former up to 5 cm long and 2.75 cm broad. Distomodaeal corallites up to 6.5 cm long. Corallites are wide apart. Major septa 5 to 7 mm broad, only slightly exsert. Costae correspond to septa and extend down the wall.

A second specimen seems to be only a young corallum with a distomodaeal corallite 8.5 cm long. It has a narrow base of attachment.

Material examined: X2:31-29, Wreck, Addu Atoll; X2:54-2, Patch reef, Addu Atoll.

Distribution: Mauritius; Maldives; Strait of Malacca; Singapore; Macclesfield Bank; Malay Archipelago; Great Barrier Reef; Cape York (North Australia).

Euphyllia fimbriata (SPENGLER), 1799

Euphyllia fimbriata

MATTHAI, 1928, p. 179; pl. 40, fig. 1; pl. 41, figs. 1–2; pl. 52, fig. 1; pl. 59, fig. 1; (synonymy).
YABE, SUGIYAMA & EGUCHI, 1936, p. 17; pl. 8, figs. 1–4.
CROSSLAND, 1952, p. 105.
NEMENZO, 1960, p. 210; pl. 1, fig. 2.

One corallum with sinuous, continuous valleys belongs to this species. The valleys are up to 20 mm wide at the peripheral part of the corallum, but are only 10 mm at the central part of the corallum. There are 10 to 15 septa per 1 cm length of valley of which 5 to 6 are broader and are about 1 mm exsert. Septa turn right or left to reach the centres. Height of corallum 10 cm, greater diameter 13 cm.

Material examined: X2:39-5, Mini Atoll, Addu Atoll.

Distribution: Red Sea; Saya de Malha Bank; Maldives; Mergui Archipelago; Strait of Malacca; Singapore; East Indies; China Sea; Philippines; Formosa; King Sound; Great Barrier Reef; Japan; Palau Islands; Rotuma.

Genus *Plerogyra* MILNE EDWARDS & HAIME, 1848

Plerogyra sinuosa (DANA), 1846

(Plate 28, Figs. 5–6; Plate 29, Fig. 1)

Plerogyra sinuosa

MATTHAI, 1928, p. 184; pl. 40, fig. 3; pl. 41, fig. 3; pl. 42, fig. 6; pl. 47, fig. 5; pl. 48, fig. 8; (synonymy).
YABE, SUGIYAMA & EGUCHI, 1936, p. 18; pl. 9, figs. 5, 6; pl. 11, fig. 4.
SCHEER, 1967, p. 433, fig. 13.
CHEVALIER, 1971, p. 46; pl. 1, fig. 5; pl. 2, fig. 2.

Plerogyra eurysepta

NEMENZO, 1960, p. 212; pl. 2, fig. 2.

We (SCHEER & PILLAI, 1974) have given elsewhere our reasons for merging *P. eurysepta* with the present species. The present collection includes a good suite of specimens. Some of them are initial growth representing the monostomodaeal condition. Others are parts or entire larger coralla where the septa are exsert up to 10 mm.

Material examined: X2:31-3, 31-10, 31-12, 31-26 (1–3), Wreck, Addu Atoll; X2:35-2, Xarifa Reef, Addu Atoll; X2:39-1, 39-11, Mini Atoll, Addu Atoll; X2:88-42, 88-47, 88-56, Lagoon bottom, Rasdu Atoll.

Distribution: Red Sea; Madagascar; Coin Peros; Maldives; Nicobars; Strait of Malacca; Singapore; Australia; Palau Islands; New Caledonia (CHEVALIER, 1971).

Genus *Physogyra* QUELCH, 1884

Physogyra lichtensteini MILNE EDWARDS & HAIME, 1851

(Plate 32, Fig. 2)

Physogyra lichtensteini — MATTHAI, 1928, p. 186; pl. 63, fig. 1; pl. 65, fig. 6; (synonymy).
YABE, SUGIYAMA & EGUCHI, 1936, p. 18; pl. 8, fig. 6.
WELLS, 1954, p. 471; pl. 178, fig. 4.
CHEVALIER, 1971, p. 51; pl. 1, fig. 2; pl. 3, figs. 1–2.

There are two specimens of this species in the present collection. One of them (X2:41-1) is hemispherical with a convex upper surface and a narrow base of attachment. Valleys continuous, width 15 to 18 mm. Septa 5 to 6 per cm length of colline; alternating in width, larger ones about 5 mm exsert. A continuous thin ridge is present at the middle of the colline. Colline highly vesicular. Edges of septa entire.

The second specimen (X2:97-3) has altogether a different appearance. The corallum is flat at the upper side. Valleys continuous or interrupted at certain places. Collines flat at the top, 10 to 15 mm thick, a median ridge is absent. The septa stand above the collines. The entire corallum resembles the peripheral growth of X2:41-1. The outstanding feature of the specimen is the flat wide colline. We believe that this is only a skeletal variation needing no separate consideration of the specimen.

Material examined: X2:41-1, Patch reef, Addu Atoll; X2:97-3, Patch reef, Gaha Faro.

Distribution: Tadjourah, Gulf of Aden (GRAVIER, 1911); Madagascar (PICHON, 1964); Maldives; Banda Sea (QUELCH, 1886); Palau Islands; Marshall Islands; New Caledonia (CHEVALIER, 1971).

5. Suborder Dendrophylliina VAUGHAN & WELLS, 1934

a) Family **Dendrophylliidae** GRAY, 1847

Genus *Dendrophyllia* DE BLAINVILLE, 1830

Dendrophyllia micranthus (EHRENBERG), 1834

Dendrophyllia micranthus — HORST, 1922, p. 49 (synonymy).
See SCHEER & PILLAI (1974) for further literature.

Material examined: X2:24-1, Xarifa Reef, Addu Atoll; X2:31-5, X2:32-5, Wreck, Addu Atoll; X2:74-5, Fusdu, Ari Atoll; X2:95-3, Outer reef, Gaha Faro.

Distribution: Red Sea eastward to Fiji.

Dendrophyllia arbuscula HORST, 1922

Dendrophyllia arbuscula — HORST, 1922, p. 53; pl. 8, fig. 6.
EGUCHI, 1968, p. C55; pl. C21, figs. 5, 13.

In a recent paper we (SCHEER & PILLAI, 1974) have given a detailed description of this species based on specimens from the Nicobar Islands. The largest specimen in the present collection, a semi-arborescent colony, is 7.5 cm in height. In younger corallites the columella is poorly developed.

Material examined: X2:76-1, 76-2, Great Faro, Ari Atoll; X2:95-6, Outer reef, Gaha Faro; X2:97-33, Patch reef, Gaha Faro.

Distribution: Maldives; Nicobars; Strait of Malacca (PILLAI & SCHEER, 1974); East Indies; Japan.

Genus *Endopsammia* MILNE EDWARDS & HAIME, 1848

Endopsammia philippensis MILNE EDWARDS & HAIME, 1848

Endopsammia philippensis — MILNE EDWARDS (& HAIME), 1860, p. 108.
FAUSTINO, 1927, p. 243, pl. 77, figs. 5, 6.

Endopsammia philippinensis WELLS, 1964a, p. 118, pl. 2, figs. 12, 13.
Balanophyllia regularis HORST, 1926, p. 50, pl. 3, figs. 10, 11.

A single corallite found attached to a calcareous alga belongs to this species. It is 5 mm in height. An epitheca is visible. Greater diameter of the calyx 3 mm; depth 1 mm. Septa in four cycles. The first three cycles are almost equal, only slightly exsert. Columella well developed, trabecular, not projecting. Septal sides granular.

Material examined: X2:45-3 (2), Xarifa Reef, Addu Atoll.

Distribution: Zanzibar; Seychelles; Amirante Isles; Chagos; Maldives; Gulf of Mannar; Philippines; Great Barrier Reef.

Genus *Tubastraea* LESSON, 1834

Tubastraea aurea (QUOY & GAIMARD), 1833

Dendrophyllia aurea HORST, 1926, p. 46; pl. 2, figs. 1, 2, 3, 4, 8, 9; (synonymy).
Tubastraea aurea BOSCHMA, 1953, p. 110–119; pl. 9, figs. 5, 6; pl. 10, figs. 2, 6; pl. 11, figs. 2, 4, 5, 6; pl. 12, figs. 1–6.
EGUCHI, 1968, p. C68; pl. C16, figs. 5, 6; pl. C17; fig. 17; pl. C26, figs. 2, 3.

11 specimens in the present collection are referred to this species. The diameter of the corallites varies from 8 to 14 mm in different specimens. Height of corallites range from 5 to 20 mm; depth 8 to 10 mm. The first two cycles of septa are broader than others. All the septa narrower at the wall than below. Septa not exsert. Septal edges entire, sides granular. Columella spongy, 2 to 4 mm in diameter, only slightly projecting. Costae subequal, wavy, with small rounded granules.

Material examined: X2:17-16(1-4), Inner reef, Hitaddu, Addu Atoll; X2:26-1, Beacon, Addu Atoll; X2:76-3 (1-3), Great Faro, Ari Atoll; X2:95-2, 95-4, 95-5, Outer reef, Gaha Faro.

Distribution: Chagos; Maldives; Palk Bay and Gulf of Mannar along the Indian coast (PILLAI, 1971b); Cocos-Keeling Islands; Singapore; Malayan region; Amboina; Great Barrier Reef; Loyalty Islands; Japan; Fanning Island; Hawaii; Galapagos; Gulf of California, Panama; Jamaica; Curaçao; Puerto Rico (as *T. tenuilamellosa*).

Remarks: BOSCHMA (1953) has discussed at length the distinction between this species, *T. coccinea* and *T. tenuilamellosa*. In a recent paper we (SCHEER & PILLAI, 1974) have identified specimens from Nicobar Islands as *T. coccinea*, based on the differences pointed out by HORST (1926) between *T. aurea* and *T. coccinea*. EGUCHI (1968) regarded *T. tenuilamellosa* as synonymous with *T. aurea*. Now we have a good suite of *Tubastraea* before us. After a comparative study of them we are really doubtful on the separate status of the three species concerned here.

Genus *Turbinaria* OKEN, 1815

Turbinaria peltata (ESPER), 1797

Turbinaria peltata BERNARD, 1896, p. 38; pls. 6–8; pl. 31, fig. 15; (synonymy).
For subsequent literature see SCHEER & PILLAI (1974).

There are eight specimens of this species in the present collection. Six of them are cup-shaped and the rest shield-shaped. In a few cases the corallites are up to 10 mm exsert.

Material examined: X2:31-7, 31-9, 31-21, 31-22, 31-23, 31-27, 31-31, 31-32, Wreck, Addu Atoll.

Distribution: Western Indian Ocean eastward to Fiji.

Turbinaria marmorea REHBERG, 1892

(Plate 32, Figs. 3, 4)

Turbinaria marmorea REHBERG, 1892, p. 43; pl. 3, fig. 2, 3.
BERNARD, 1896, p. 65.

Description of the present specimen: Corallum a horizontal, fan-shaped plate, partly broken. Greater spreads 34 × 27 cm. Thickness at the base of attachment about 10 mm, at the growing edge 3 mm. Under side looks

spongy and smooth to the naked eye, but under the lens reveals very low, crowded ridges with minute granulations. Corallites 2 mm in diameter, up to 1 mm exsert, vertical, adjacent ones about 5 mm apart. Openings oval or rounded. Septa 12 to 16, subequal, projecting to half radius circle at the wall and then descending vertically. Septal edges minutely dentate. Columella deep-seated, elongated, lamellar.

Coenenchymal surface at the upper side similar in detail to that of the under side. In section the corallum shows a lower solid layer, a middle trabecular layer, where the corallites intercommunicate, and an upper solid layer as clearly illustrated in REHBERG's plate 3, figure 3.

Material examined: X2:69-4, Faro, Ari Atoll.

Distribution: REHBERG's type of the species are from Palau Islands and Ponape (Caroline Islands). There seems to be no subsequent record of this species from any other locality.

The present record extends its distribution to the Central Indian Ocean to the Maldives.

Turbinaria mesenterina (LAMARCK), 1816

Turbinaria mesenterina — BERNARD, 1896, p. 57; pl. 15; pl. 32, fig. 10; (synonymy).
YABE & SUGIYAMA, 1941, p. 86; pl. 96, figs. 1, 1a, 1b.
WELLS, 1954, p. 472.

X2:50-17 is a thick frond, which probably was growing vertically. The corallites are projecting to 2 mm with a diameter of 3 mm. Septa 20 to 22. Columella deep-seated, flat. There are yet another three small coralla in the collection which we believe to be belonging to this species. The coralla are explanate. The corallites are level to slightly projecting. In all the three specimens the surface shows a fine ridges and furrow system.

Material examined: X2:50-17, Northern reef flat, Addu Atoll; X2:75-7, Great Faro, Ari Atoll; X2:88-45 and 88-52, Lagoon bottom, Rasdu Atoll.

Distribution: Red Sea; Rodriguez; Madagascar; Maldives; Gulf of Mannar; Great Barrier Reef; Caroline Islands; Marshall Islands.

Abstract

The history of the major marine and terrestrial investigations in the Maldives, beginning with the survey of Commander R. MORESBY during 1834 to 1836, is briefly reported. The largest contribution to the knowledge of the Maldivian fauna and flora came as a result of J.S. GARDINER's expedition in 1899 to 1900. Further results were obtained by the John MURRAY Expedition 1933–34 led by R.B. SEYMOUR SEWELL, and by the collections of Major W.W.A. PHILLIPS in the post-war period. The "Xarifa" Expedition 1957/58 spent several months in the Maldives and was followed 1964 by another of the University of Cambridge under the leadership of D.R. STODDART.

The "Xarifa" Expedition of the International Institute for Submarine Research, Vaduz, led by Dr. H. HASS, called with a team of scientists at different Maldivian atolls during December 1957 to April 1958, and assembled collections of fishes, birds, corals and other marine invertebrates. On these collections is already reported by various workers.

The present work deals with the stony corals, brought home from Addu, Ari, Rasdu and Fadiffolu Atoll. Further data from Suvadiva Atoll, Gaha Faro and Miladummadulu Atoll are incorporated. The various collecting stations with their ecological conditions and assemblages of corals are briefly reported.

The systematic section comprises 143 species of reef corals and 4 ahermatipic species from 52 genera and 14 families. These 147 species are described and their affinities discussed, information on their geographical distribution are summarized. 57 species are figured. A table shows the coral species collected on the different stations with the frequency of their occurrence. Further a check-list of all Maldivian corals, referred to in literature and comprising 241 species from 75 genera, is provided with their known occurrence in various atolls.

8 species are described as new to science and one received a new name. 10 species are found for the first time from the Indian Ocean.

Zusammenfassung

In einem kurzen Überblick wird über die wichtigsten Untersuchungen zu Wasser und zu Land in den Malediven berichtet, beginnend mit den Vermessungsarbeiten von Commander R. MORESBY 1834 bis 1836. Den größten Beitrag zur Kenntnis der Fauna und Flora der Malediven erzielte die Expedition von J.S. GARDINER 1899 bis 1900. Weitere Ergebnisse erbrachten die John-MURRAY-Expedition 1933–34 unter Leitung von R.B. SEYMOUR SEWELL und die Sammlungen von Major W.W.A. PHILLIPS nach dem 2. Weltkrieg. 1957/58 besuchte die „Xarifa"-Expedition für einige Monate die Malediven, der 1964 eine weitere der Universität Cambridge unter Leitung von D.R. STODDART folgte.

Die „Xarifa"-Expedition des Internationalen Instituts für Submarine Forschung, Vaduz, lief mit einem Team von Wissenschaftlern unter Leitung von Dr. H. HASS von Dezember 1957 bis April 1958 verschiedene Atolle der Malediven an und brachte große Sammlungen von Fischen, Vögeln, Korallen und anderen marinen Wirbellosen zusammen. Über diese Sammlungen wurde bereits von verschiedenen Bearbeitern berichtet.

Die vorliegende Arbeit befaßt sich mit den vom Addu-, Ari-, Rasdu- und Fadiffolu-Atoll mitgebrachten Korallen. Weiterhin wurden Funde vom Suvadiva-Atoll, von Gaha Faro und vom Miladummadulu-Atoll berücksichtigt. Über die verschiedenen Fundorte mit ihren ökologischen Bedingungen und Korallengesellschaften wird kurz berichtet.

Der systematische Teil umfaßt 143 Riffkorallen und 4 ahermatypische Arten aus 52 Gattungen und 14 Familien. Diese 147 Arten werden beschrieben und ihre Verwandtschaftsverhältnisse erörtert, ihre geographische Verbreitung wird angegeben. 57 Arten sind abgebildet. Eine Tabelle zeigt die an den verschiedenen Fundorten gesammelten Korallen mit der Häufigkeit ihres Vorkommens. Weiterhin umfaßt eine Check-Liste alle 241 Maledivenkorallen aus 75 Gattungen, über die in der Literatur berichtet wurde, und ihr Vorkommen in verschiedenen Atollen.

8 Arten werden neu beschrieben, eine Art erhielt einen neuen Namen. 10 Arten wurden zum ersten Mal im Indischen Ozean gefunden.

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Index for the systematic part

(Boldface figures refer to species treated in detail)

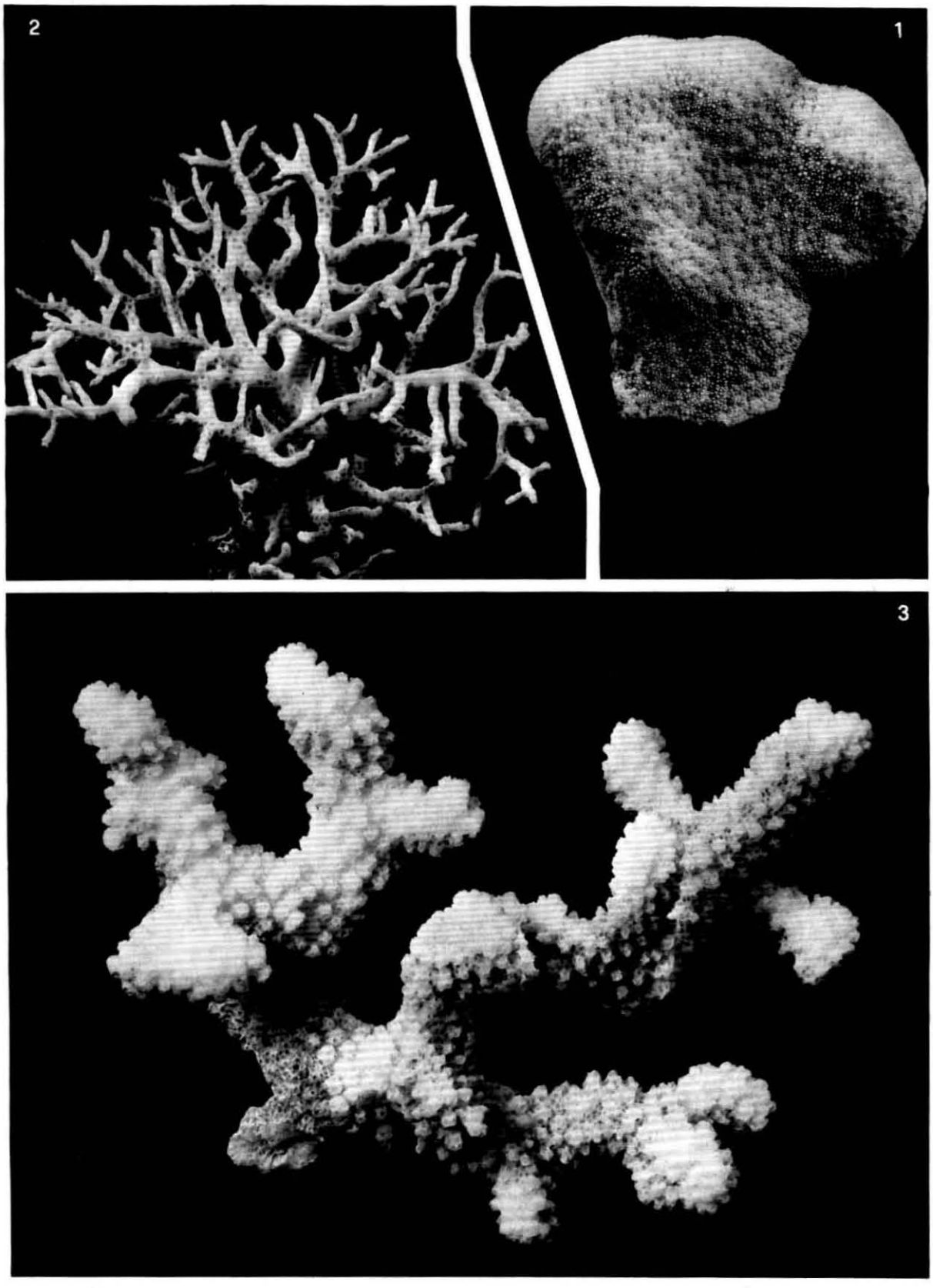


Fig. 1. *Psammocora (Stephanaria) togianensis*, X2:66–4(2) (x1).
Fig. 2. *Pocillopora acuta*, X2:88–15 (x1).
Fig. 3. *Pocillopora molokensis*, X2:31–8 (x1).

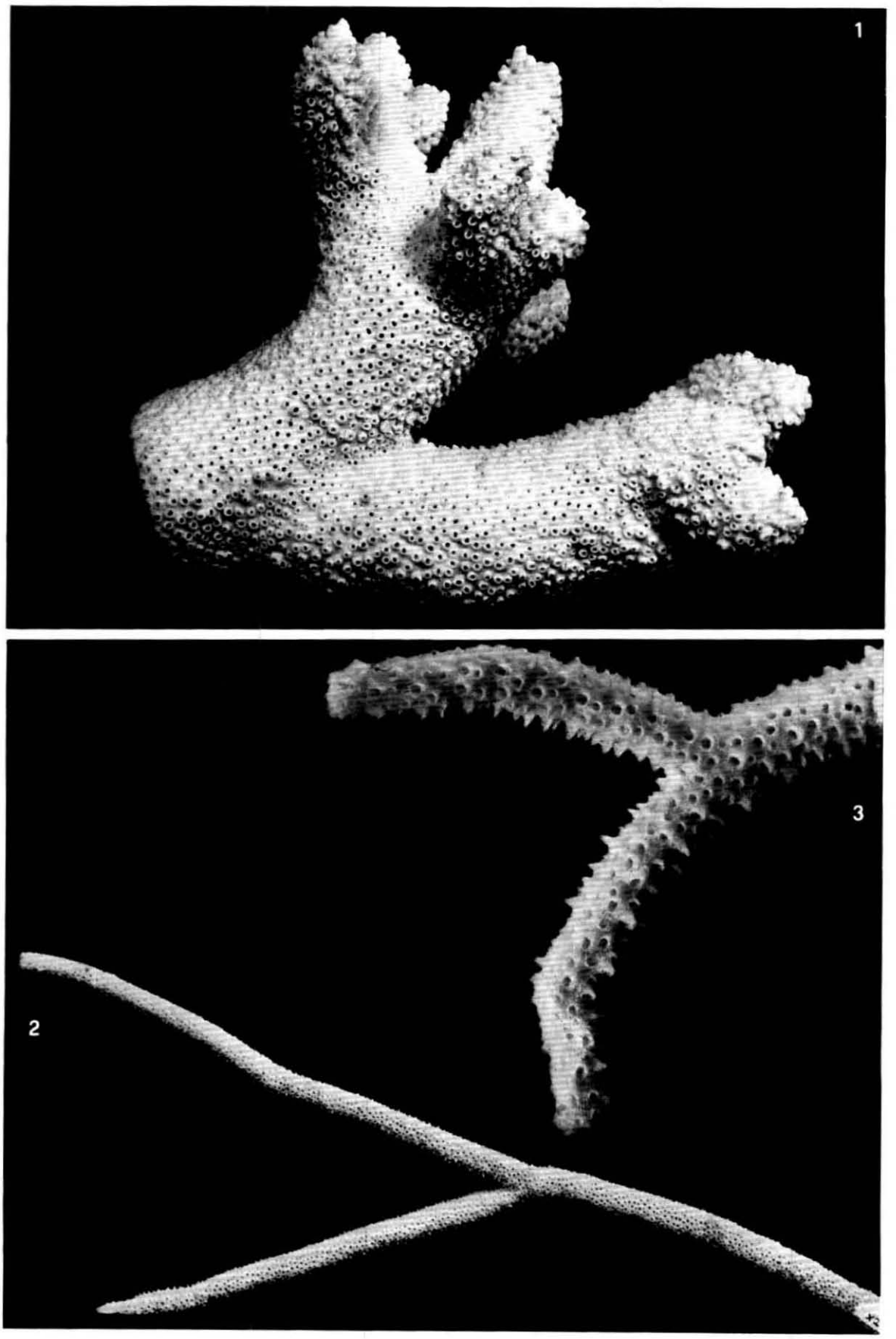
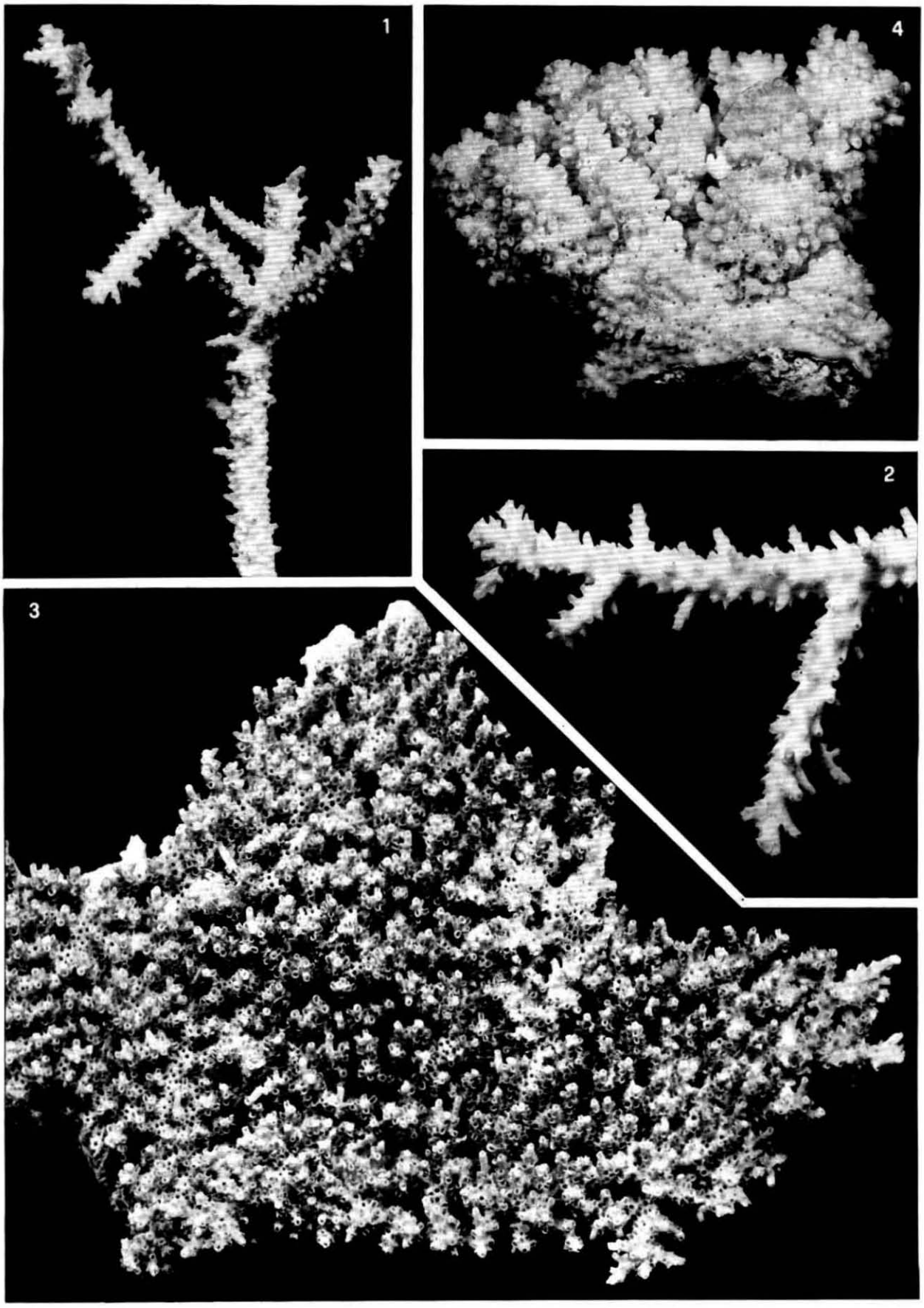


Fig. 1. *Acropora intermedia*, X2:67–6 (x1).
Fig. 2. *Acropora teres*, X2:18–22a (x0.5).
Fig. 3. *Acropora teres*, X2:18–22e (x2).



Figs. 1, 2. *Acropora pharaonis*, X2:72–1 (1:x0.6; 2:x1.1).
Fig. 3. *Acropora efflorescens*, X2:Sch 43 (x1).
Fig. 4. *Acropora vasiformis*, X2:81–7 (x1).

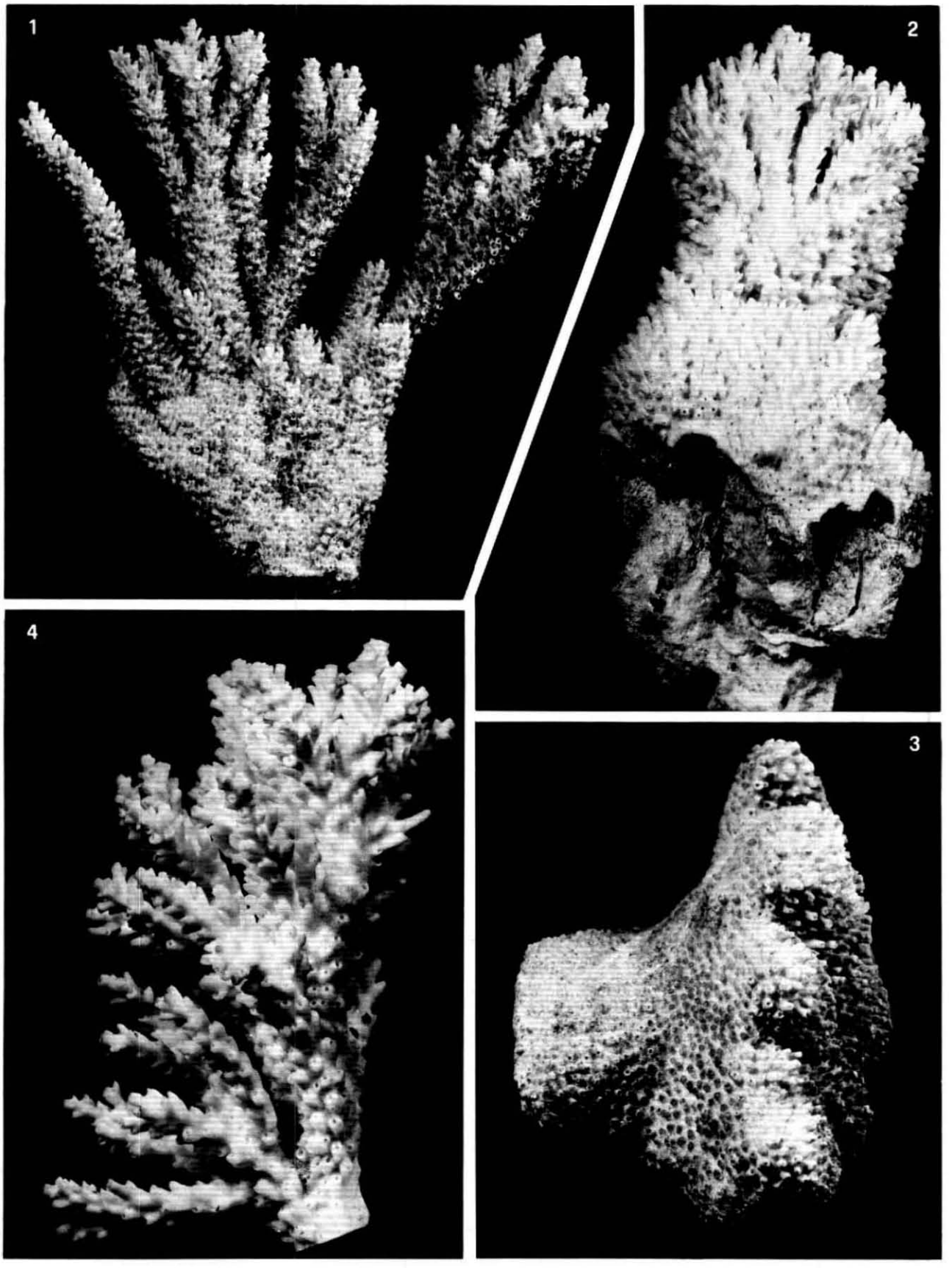
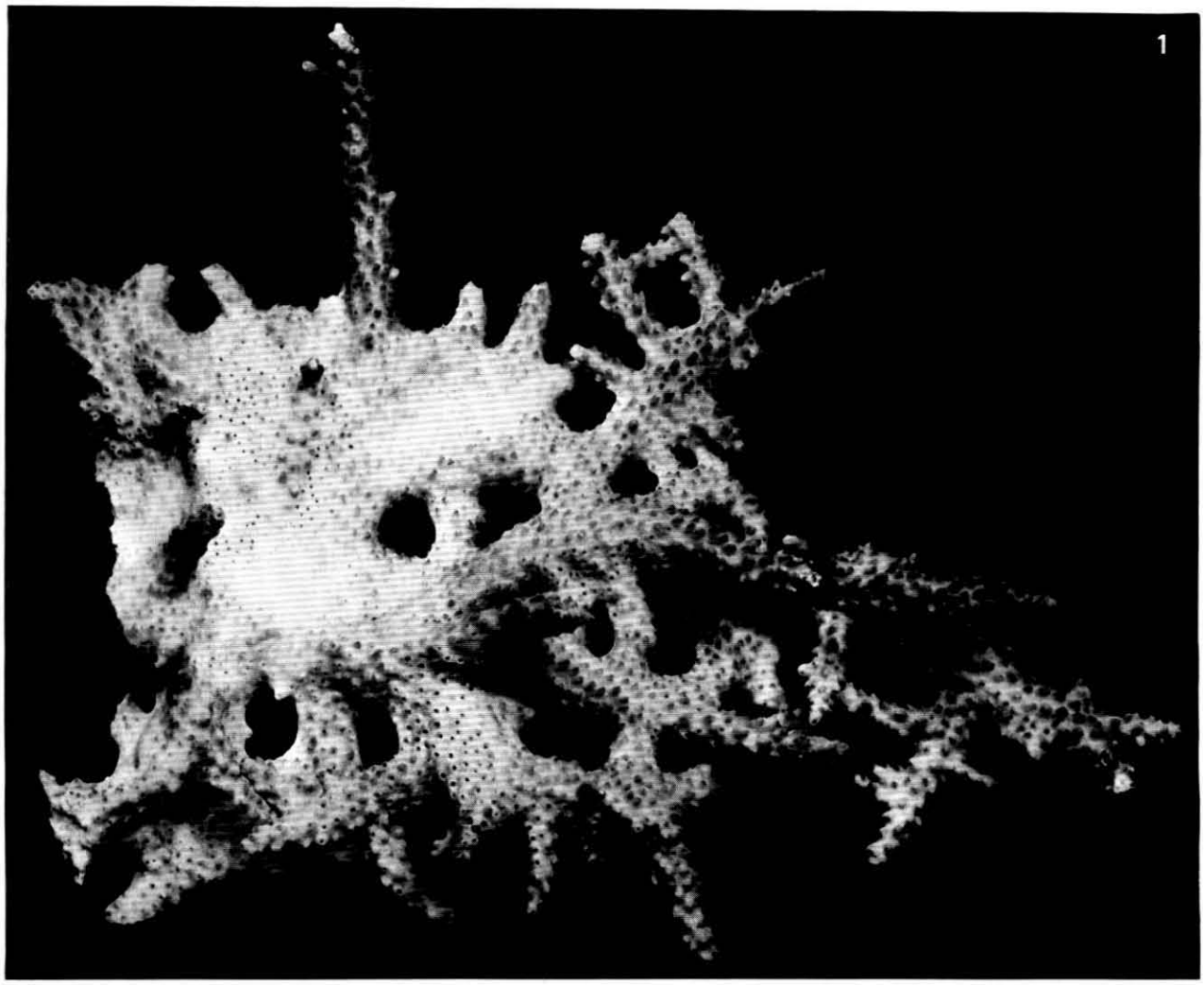


Fig. 1. *Acropora irregularis*, X2:Sch 35 (x0.7).
Fig. 2. *Acropora irregularis*, X2:17–18 (x1).
Fig. 3. *Acropora irregularis*, X2:Sch 39 (x1).
Fig. 4. *Acropora quelchi*, X2:58–3 (x1).



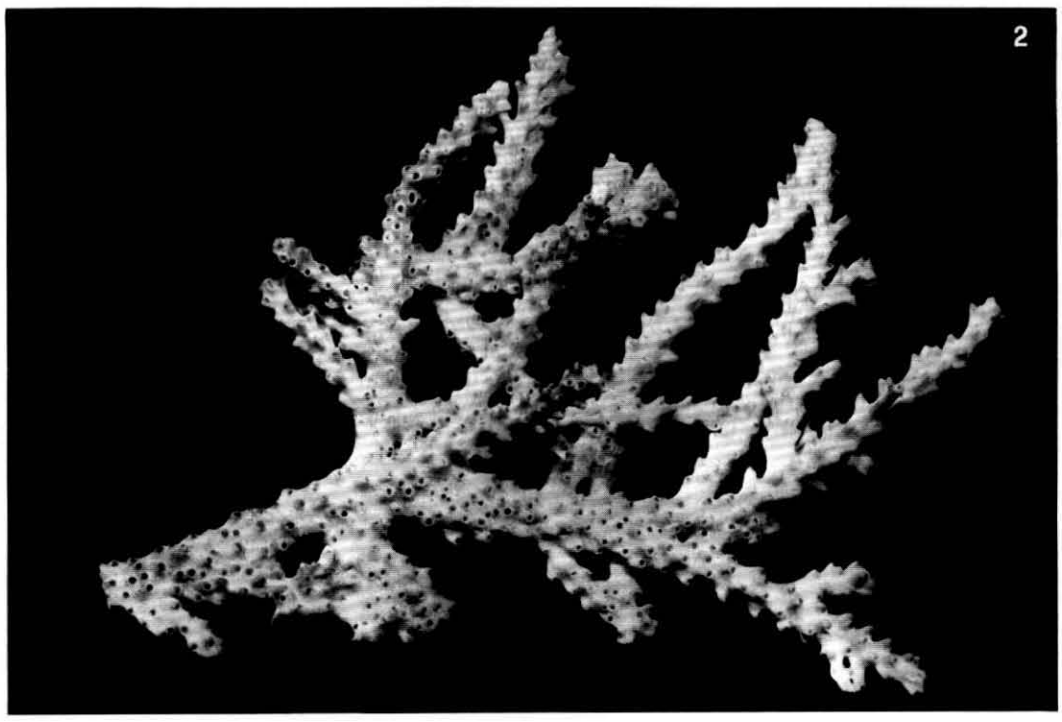


Fig. 1. *Acropora stoddarti*, X2:57–3 (x0.75).

Fig. 2. *Acropora stoddarti*, X2:31–24 (x0.7).

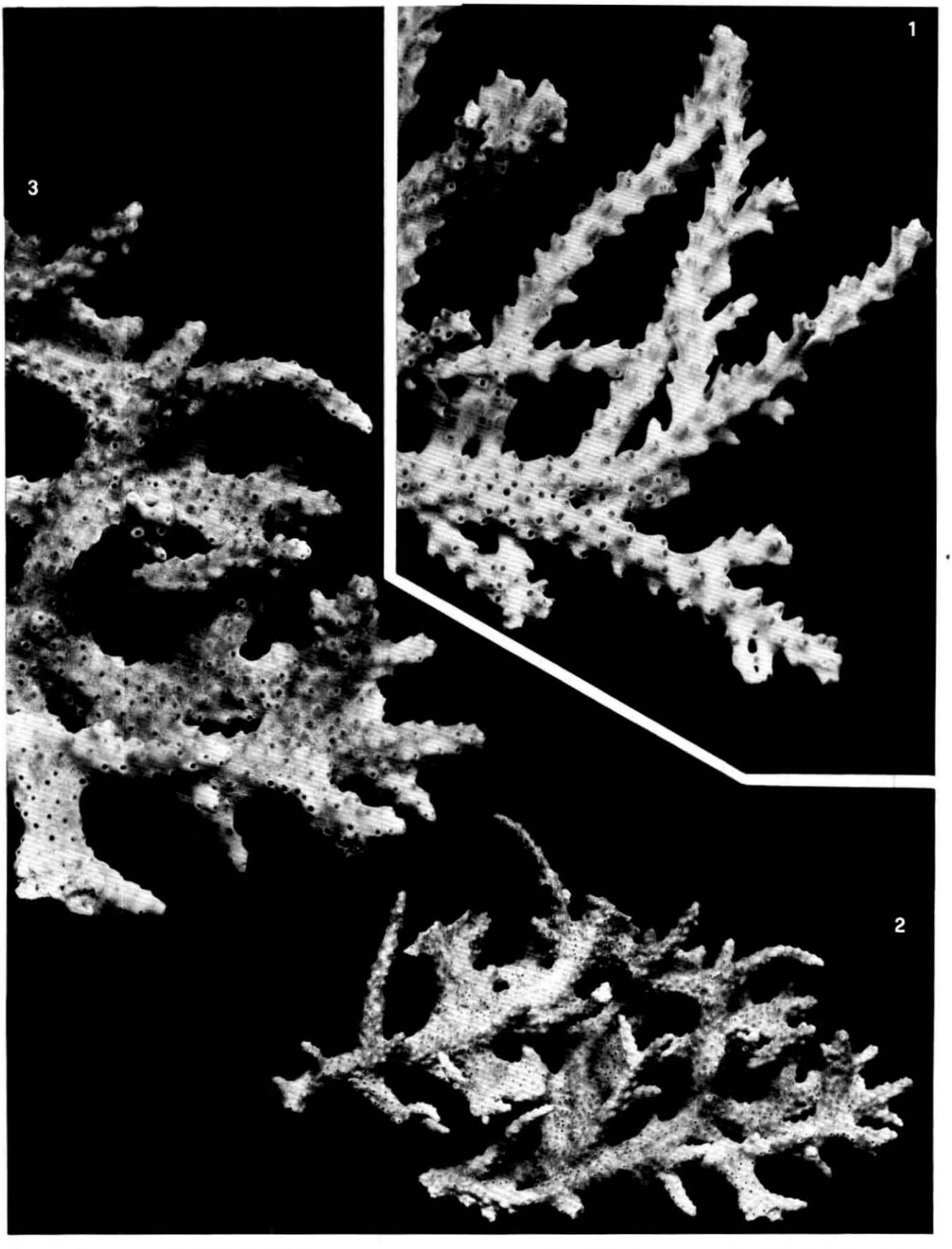
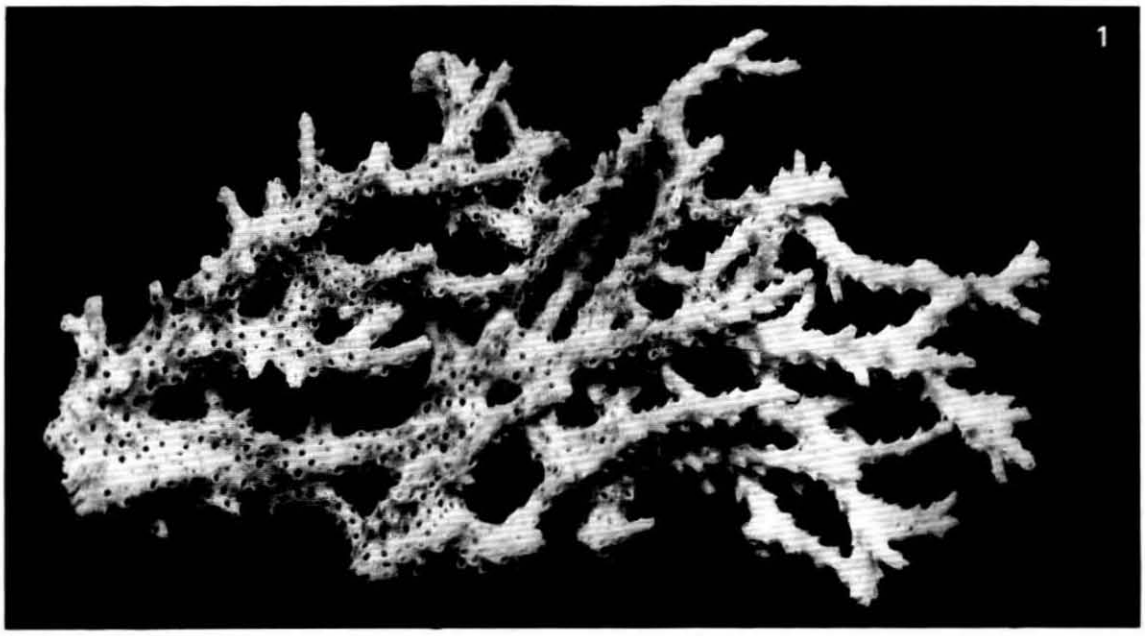
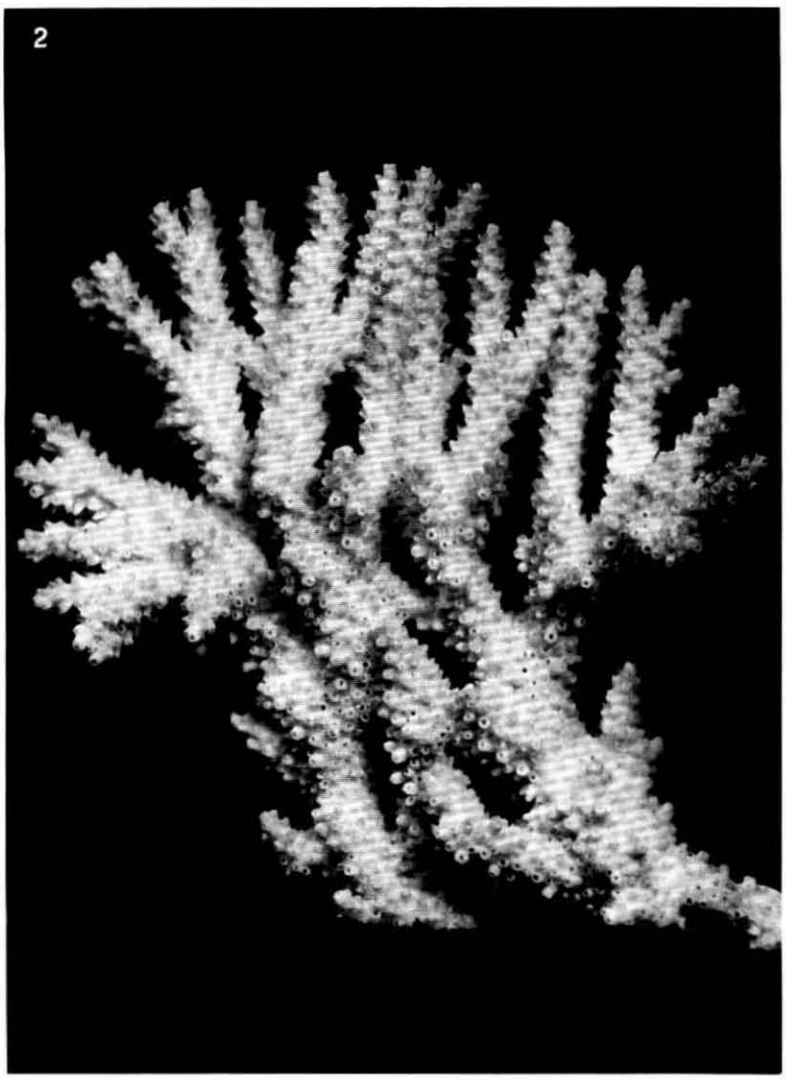
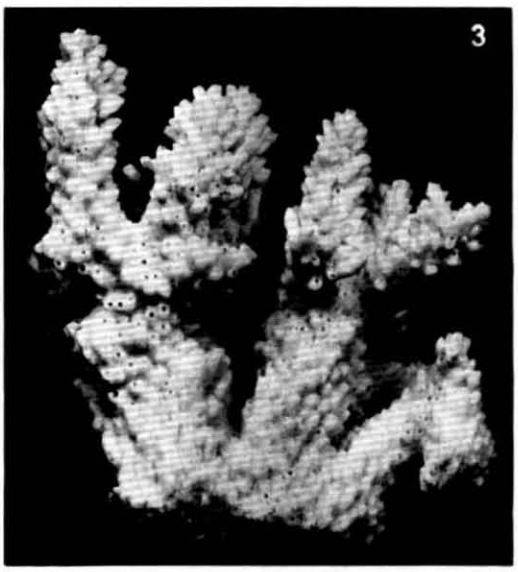


Fig. 1. *Acropora stoddarti,* X2:31–24 (x1).

Figs. 2, 3. *Acropora stoddarti,* X2:56–1 (2:x0.5; 3:x1).







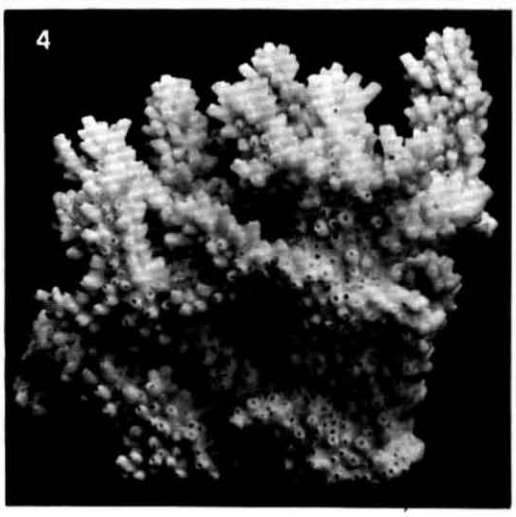


Fig. 1. *Acropora reticulata*, X2:31–4 (x1).
Figs. 3, 4. *Acropora valida*, X2:81–9 (3:x1; 4, back side:x1).

Fig. 2. *Acropora complanata*, X2:200–6 (x1).

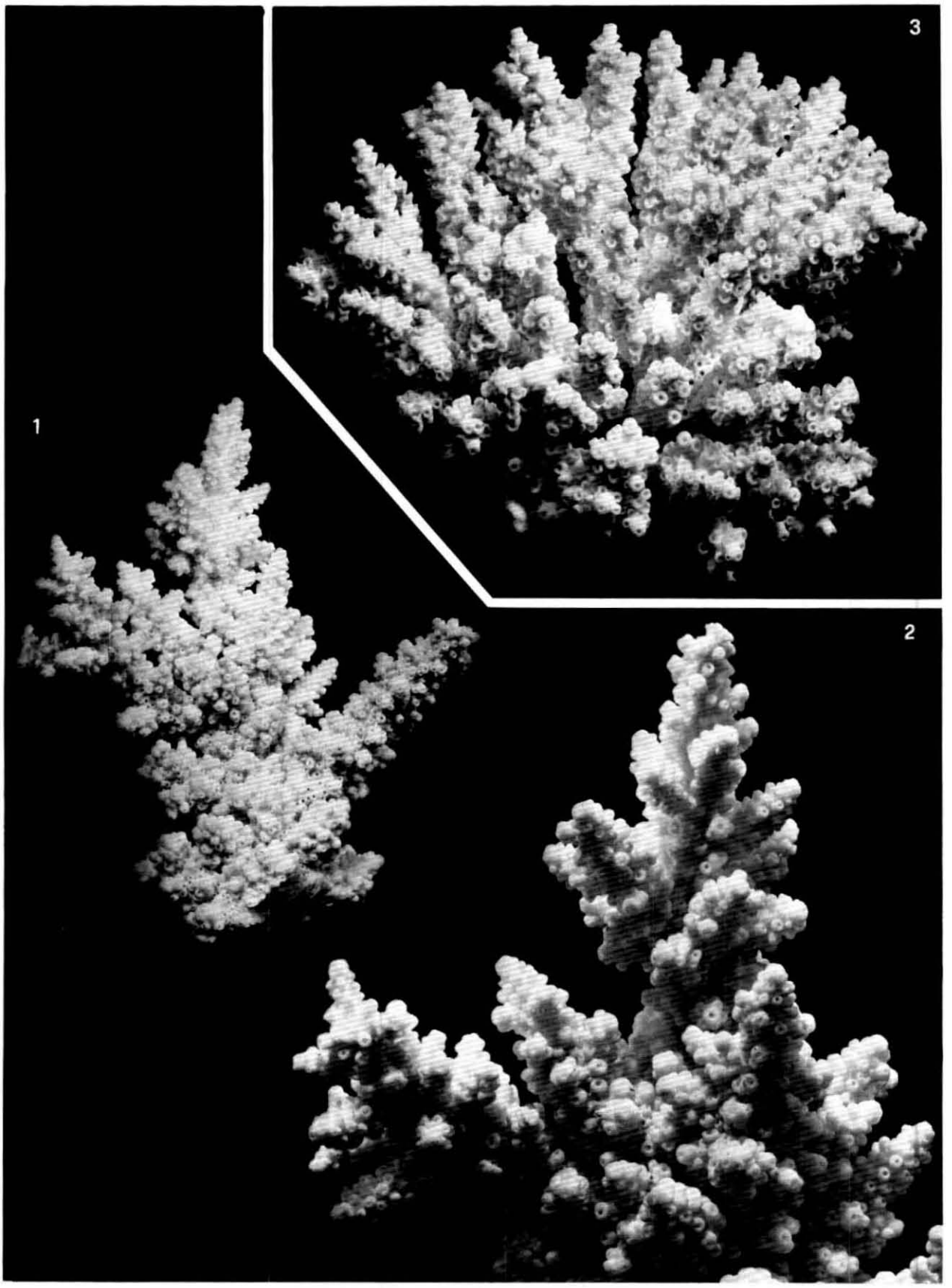


Fig. 1,2. *Acropora forskali*, X2:107–1 (1:x0.5; 2:x1).
Fig. 3. *Acropora eurystoma*, X2:Sch 22 (x1).

Fig. 1.
Acropora elseyi, X2:45–5 (x1.1).

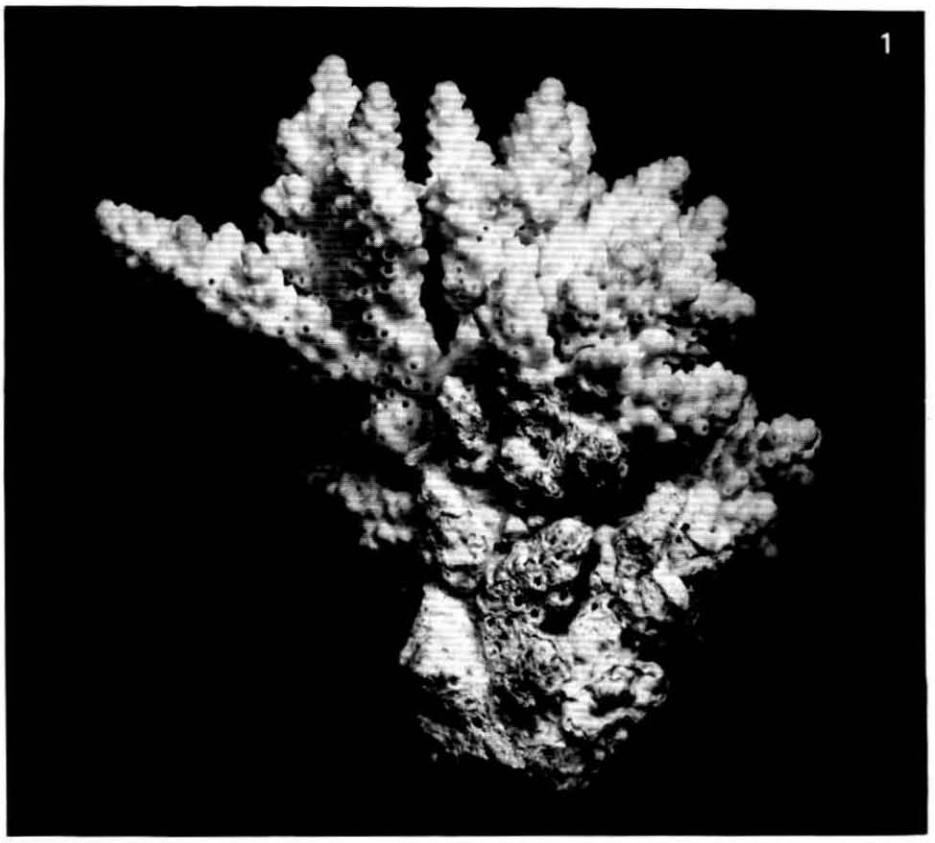
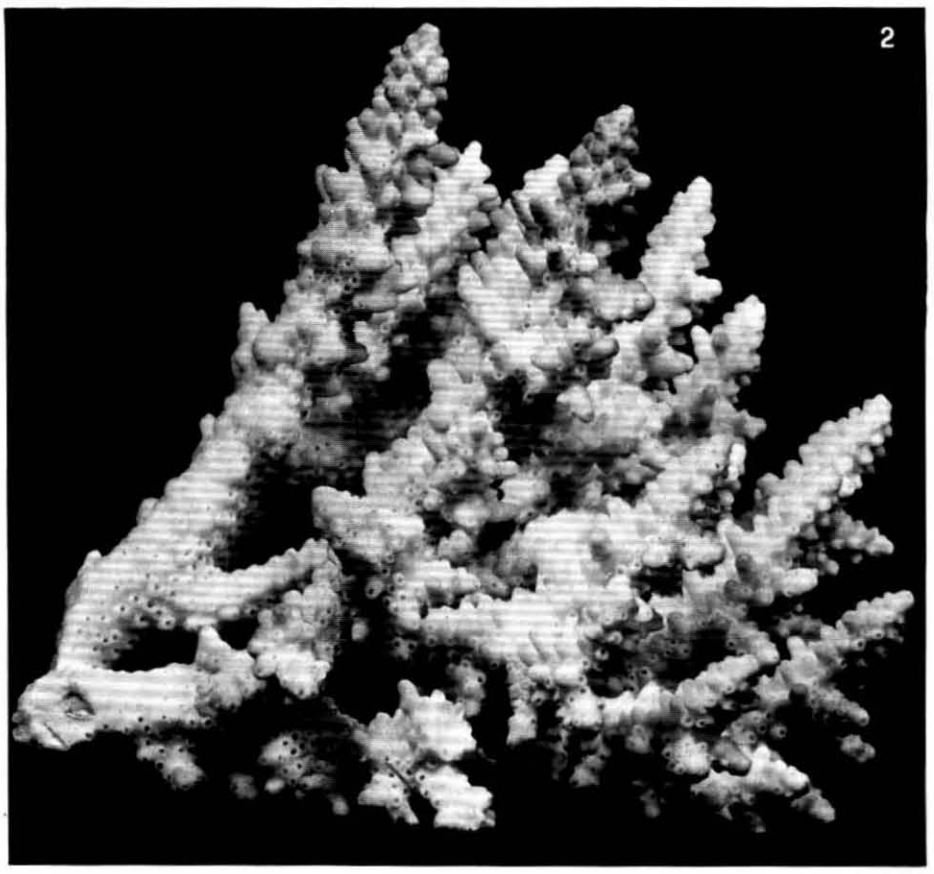
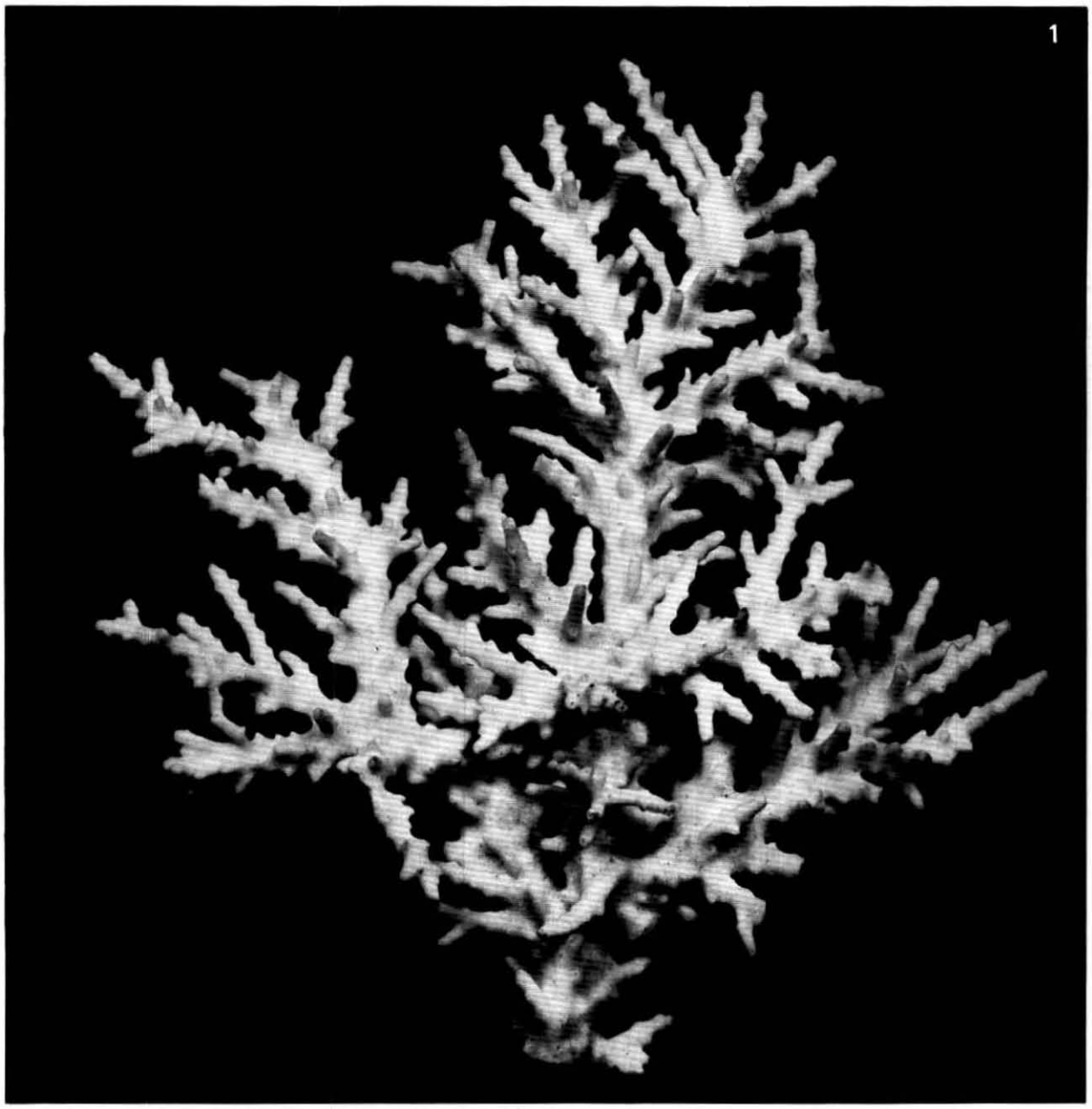


Fig. 2.
Acropora concinna, X2:82–2 (x1).





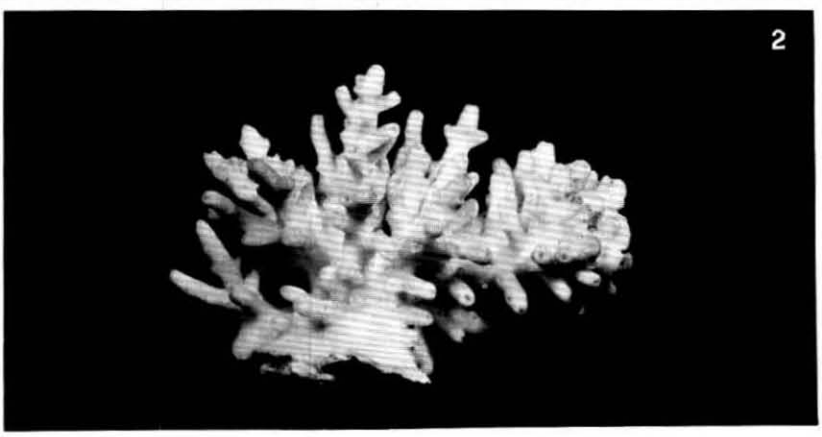
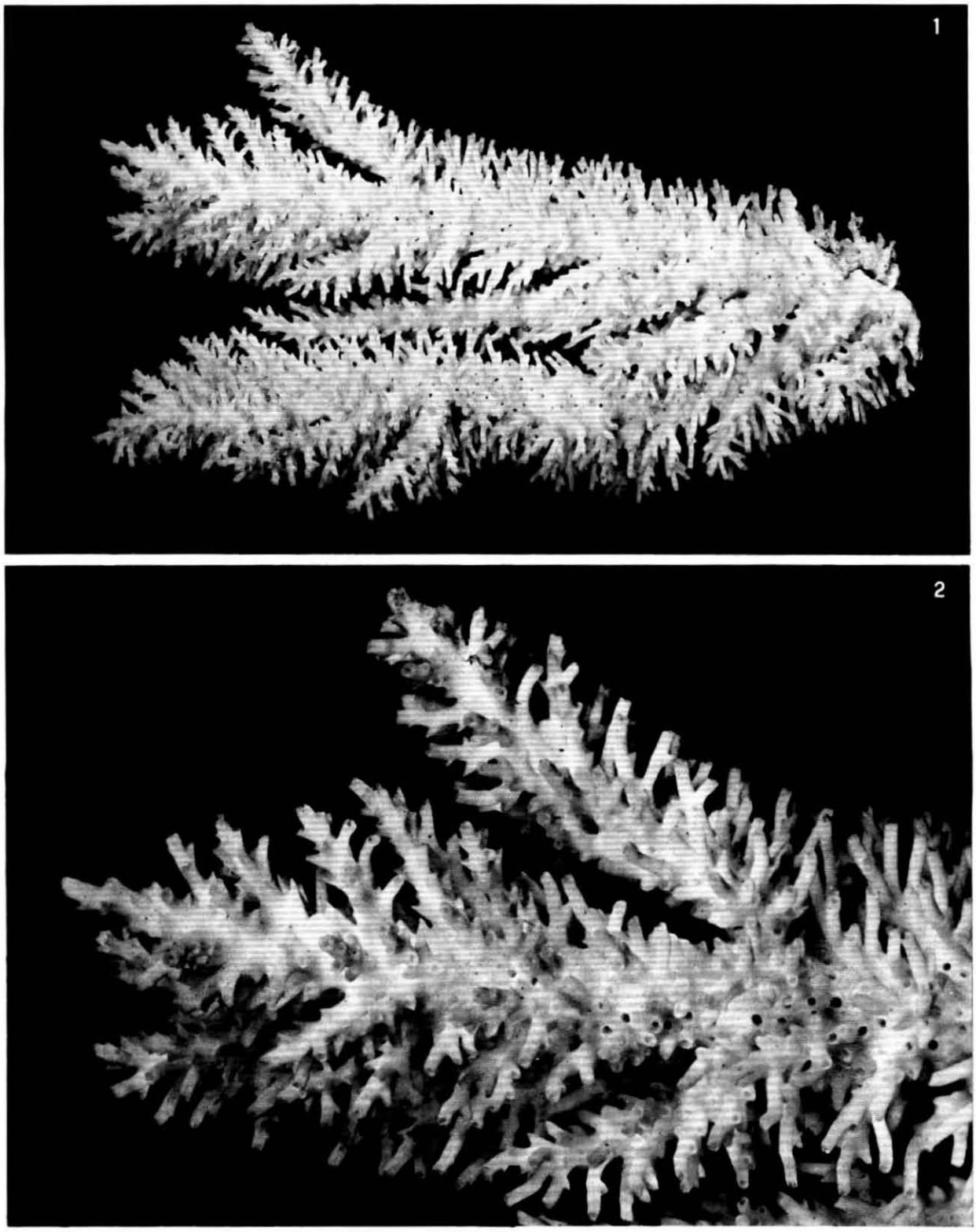
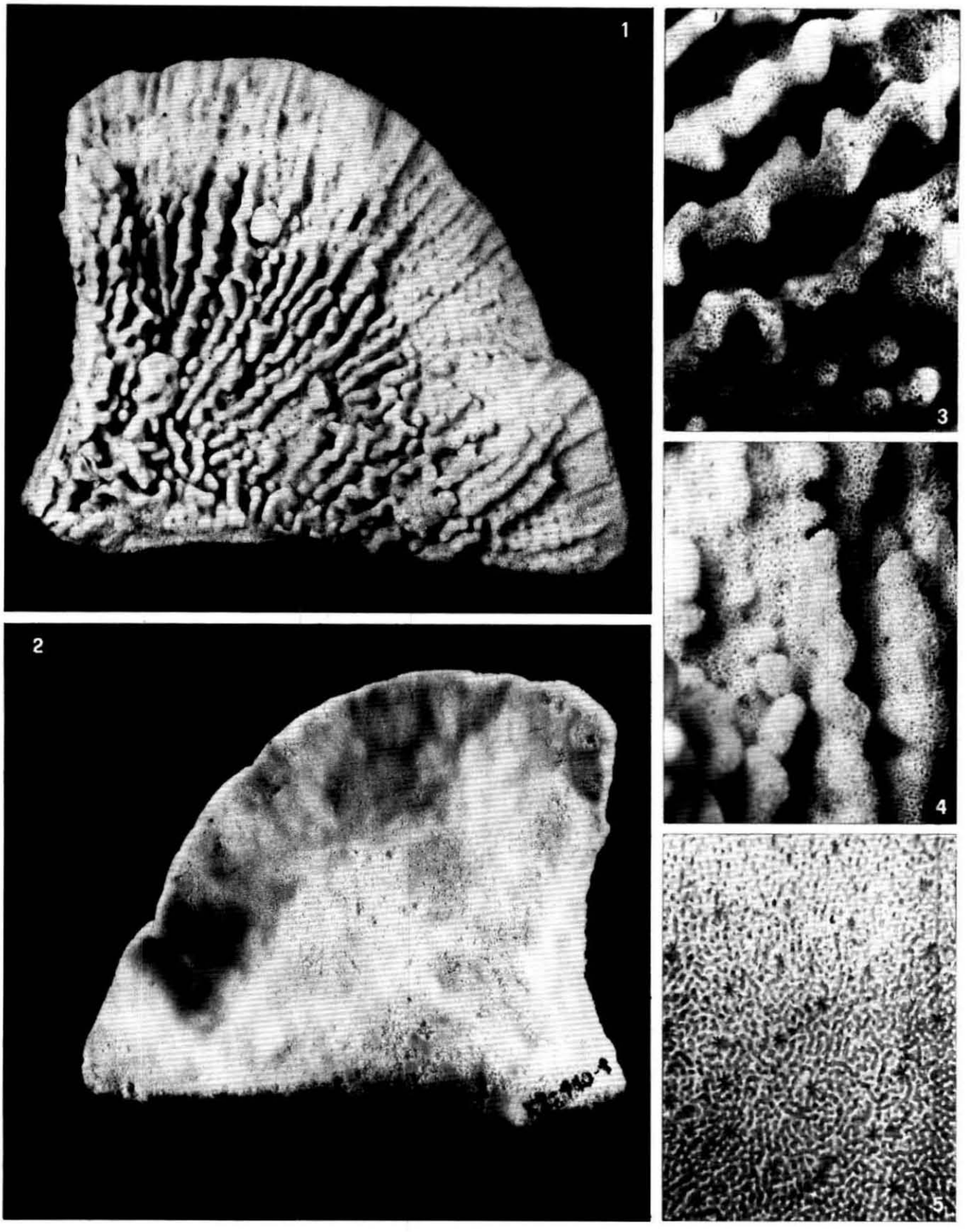


Fig. 1. *Acropora eibli*, X2:88–2 (x1.1).

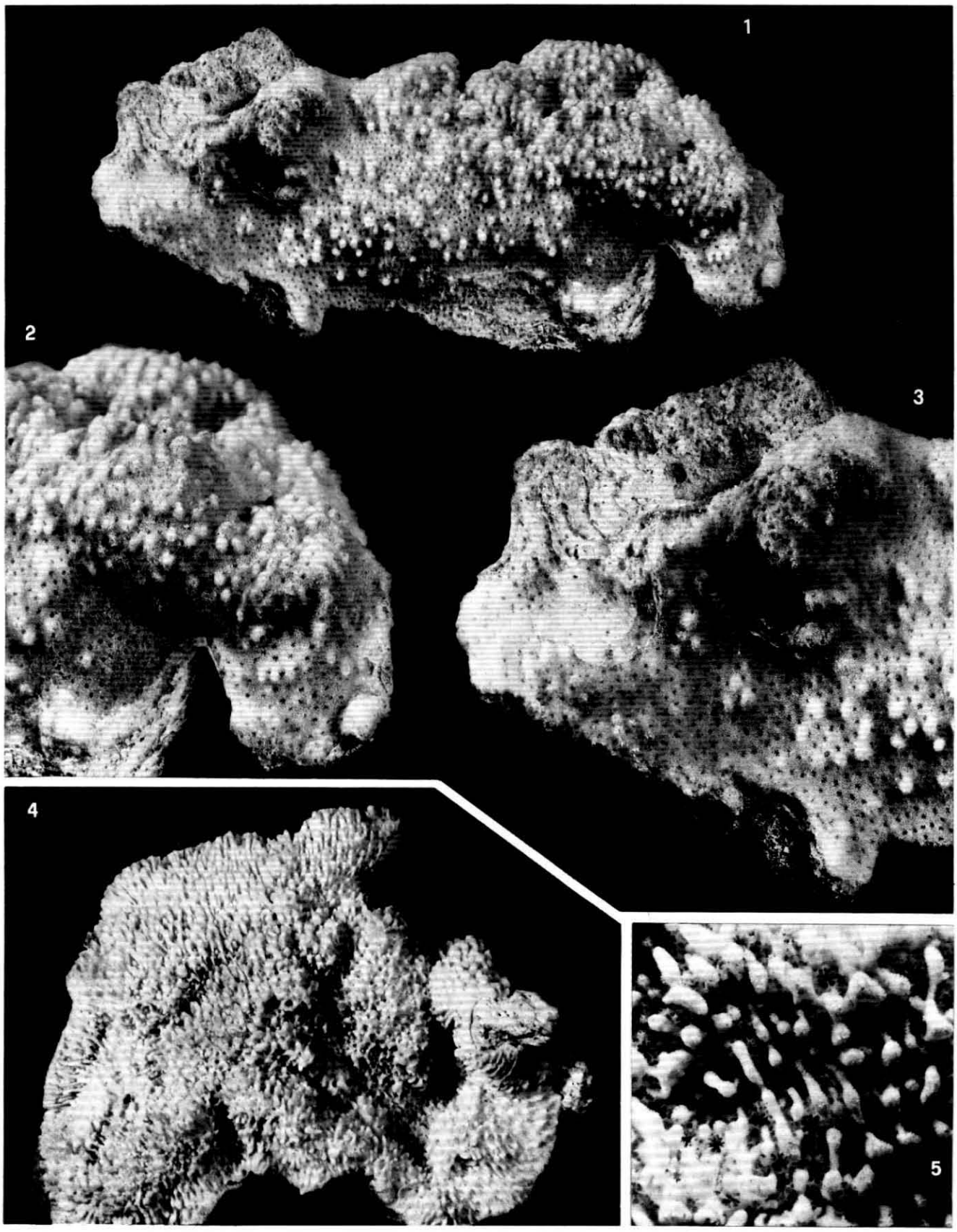
Fig. 2. *Acropora eibli*, X2:41–6 (x1.2).



Figs. 1, 2. *Acropora echinata*, X2:85–3a (1:x0.75; 2:x1.8).

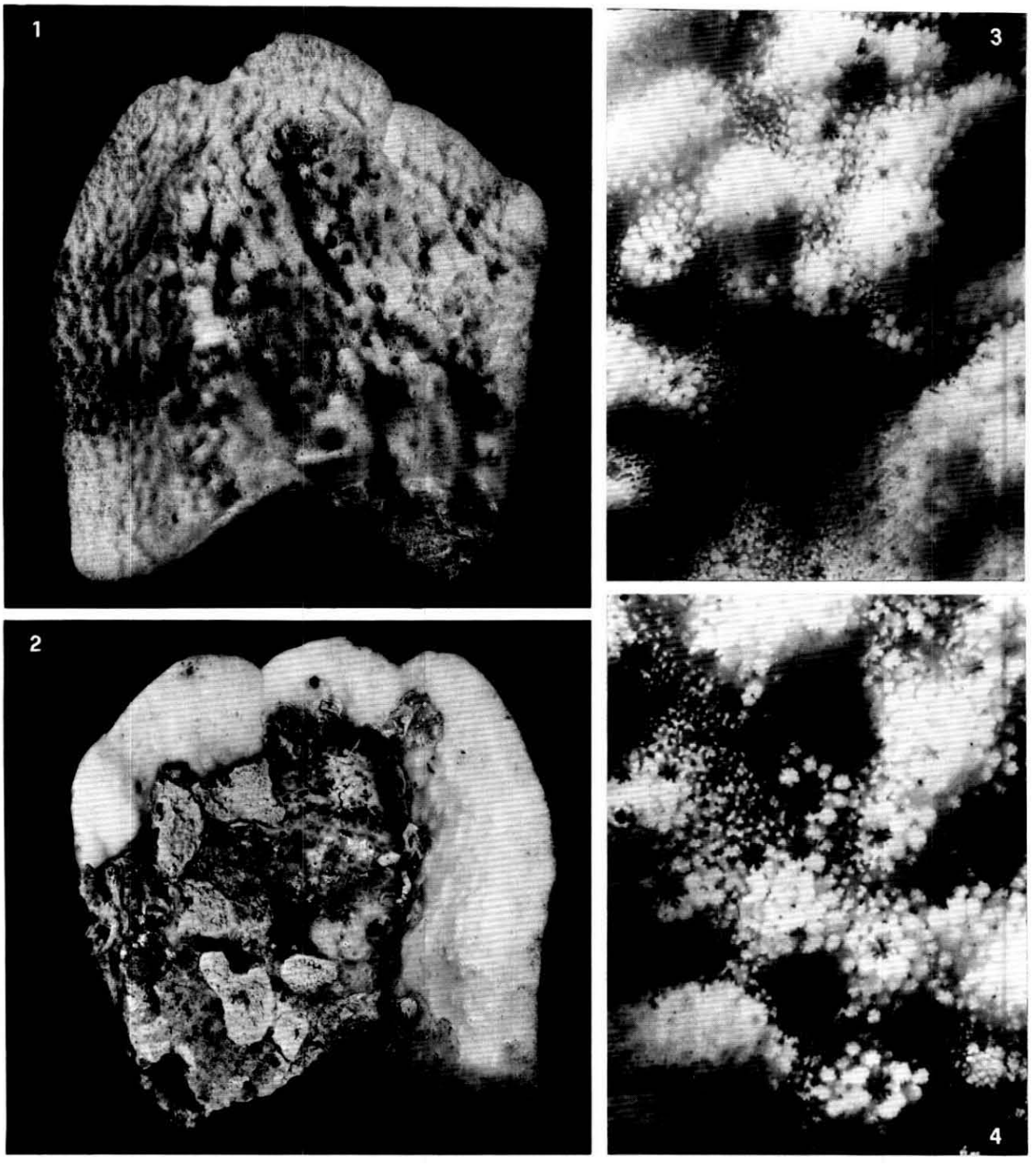


Figs. 1–5. *Montipora sinuosa*, X2:110–1 (1:x1.1; 2, back side:x1; 3, 4:x3; 5, back side:x6).

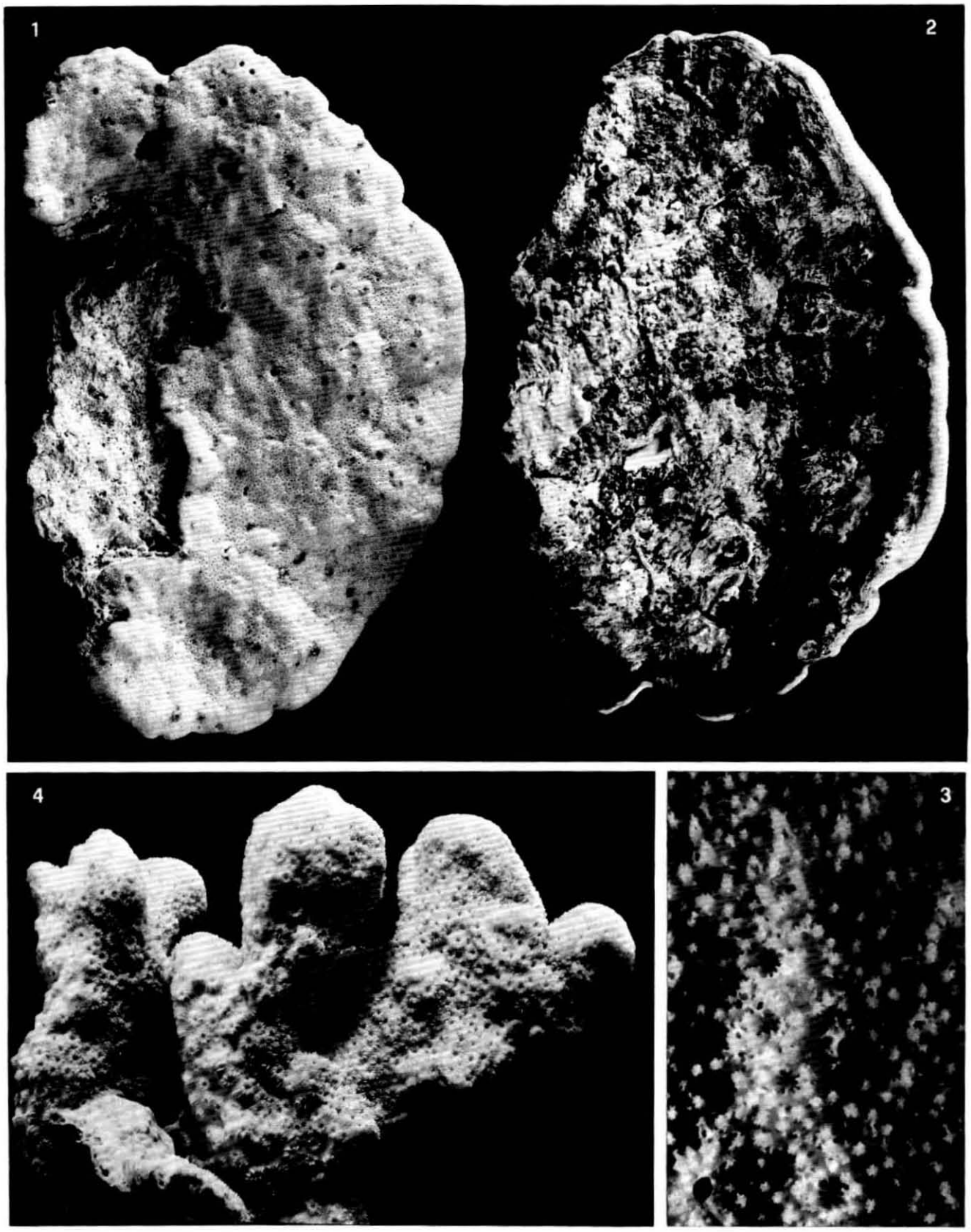


Figs. 1–3. *Montipora floweri*, X2:18–17 (1:x1; 2, 3:x1.7).

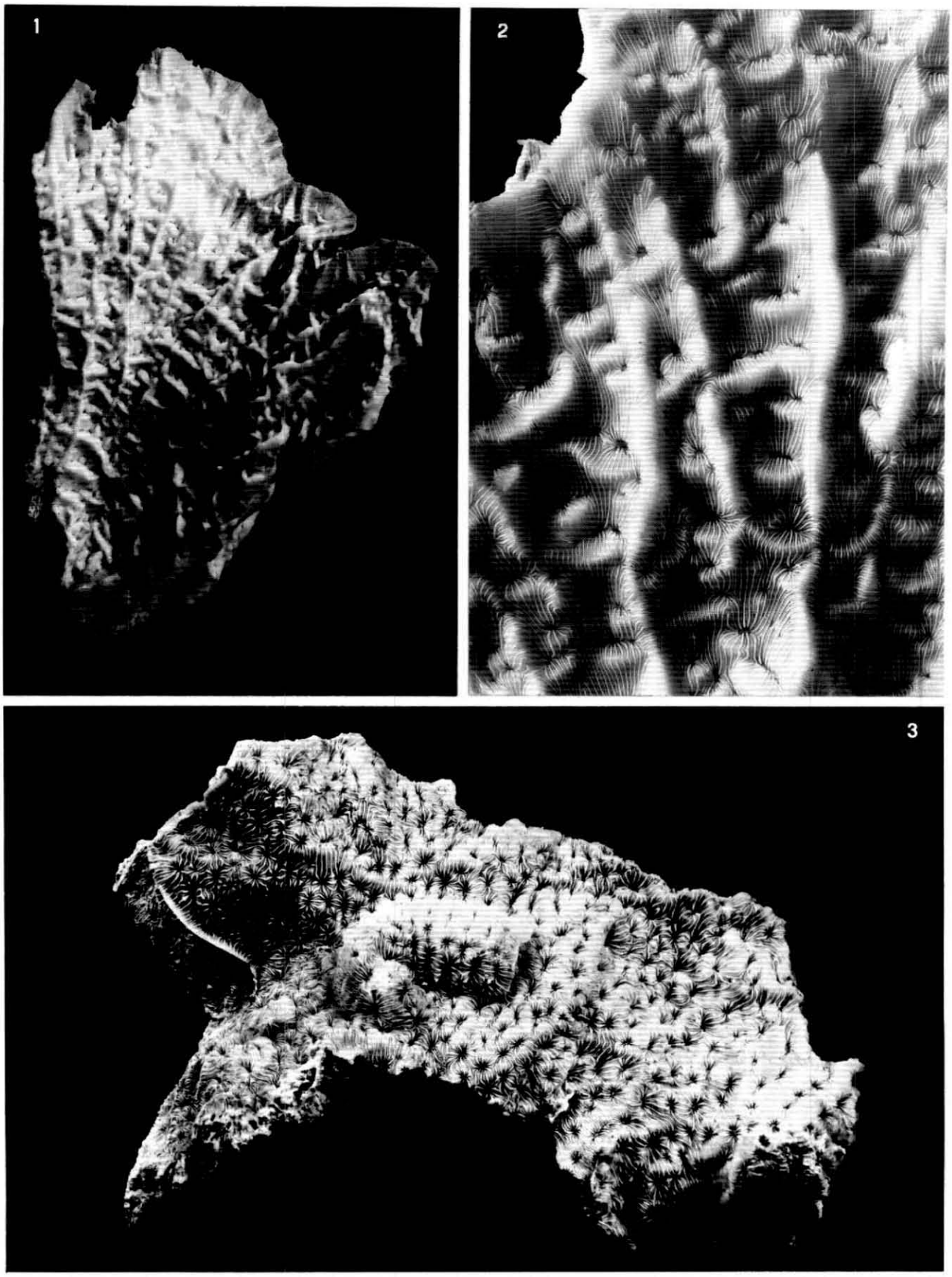
Figs. 4, 5. *Montipora prolifera*, X2:29–6 (4:x1.1; 5:x4).



Figs. 1–4. *Montipora suvadivae*, X2:63–1 (1:x1; 2, back side:x1; 3:x5; 4:x8).



Figs. 1–3. *Montipora maldivensis*, X2:101–4 (1:x0.5; 2, back side:x0.5; 3:x7).
Fig. 4. *Pavona (Pseudocolumnastrea) pollicata*, X2:100–12 (x1).



Figs. 1, 2. *Pavona yabei*, X2:97–2 (1:x0.6; 2:x2).

Fig. 3. *Pavona explanulata*, X2:100–3 (x1.1).

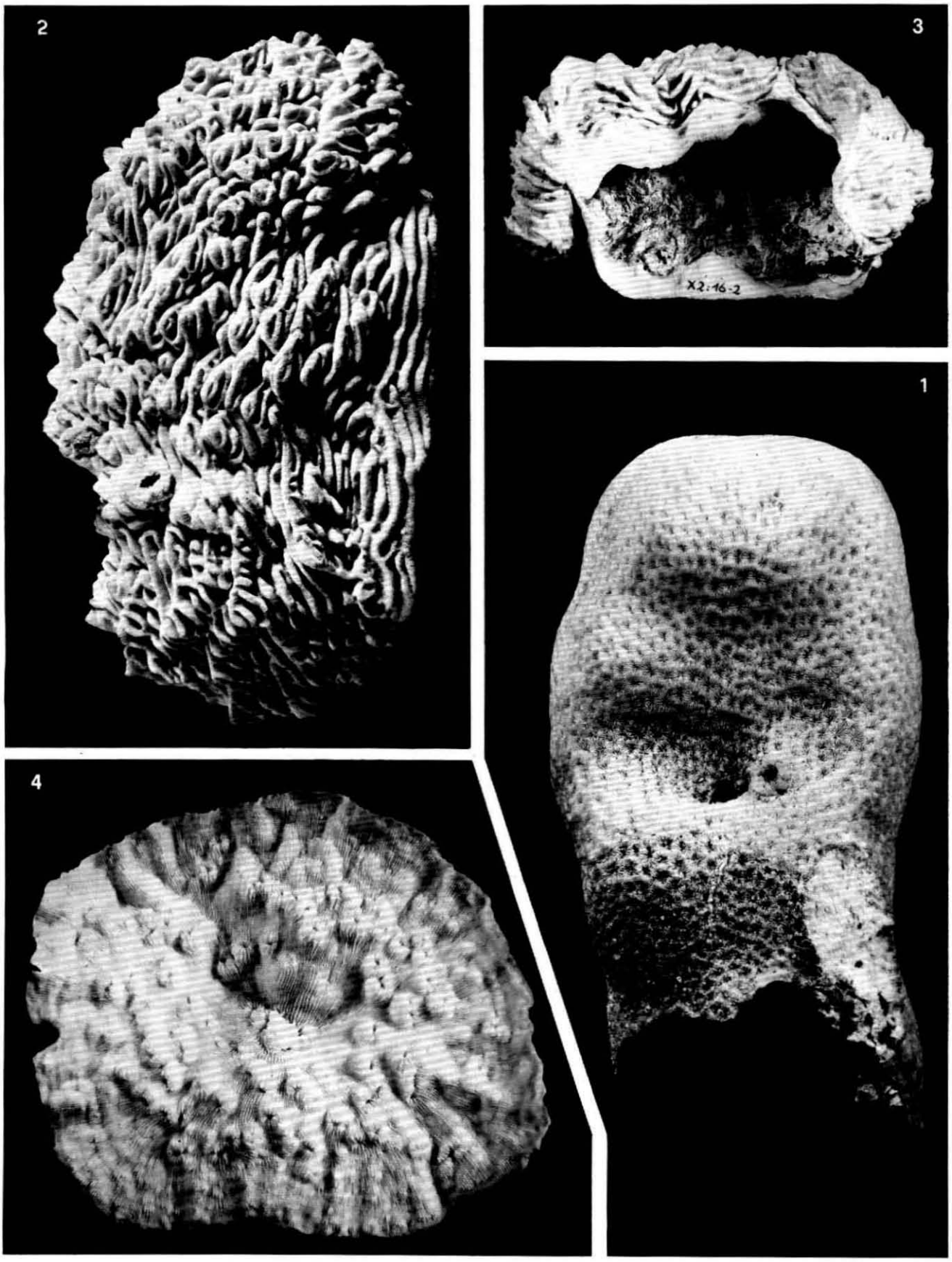


Fig. 1. *Pavona maldivensis,* X2:93–1 (x1.1).
Figs. 2, 3. *Pachyseris valenciennesi,* X2:16–2 (2:x1; 3, back side:x2/3).

Fig. 4. *Leptoseris scabra,* X2:76–7 (x2/3).

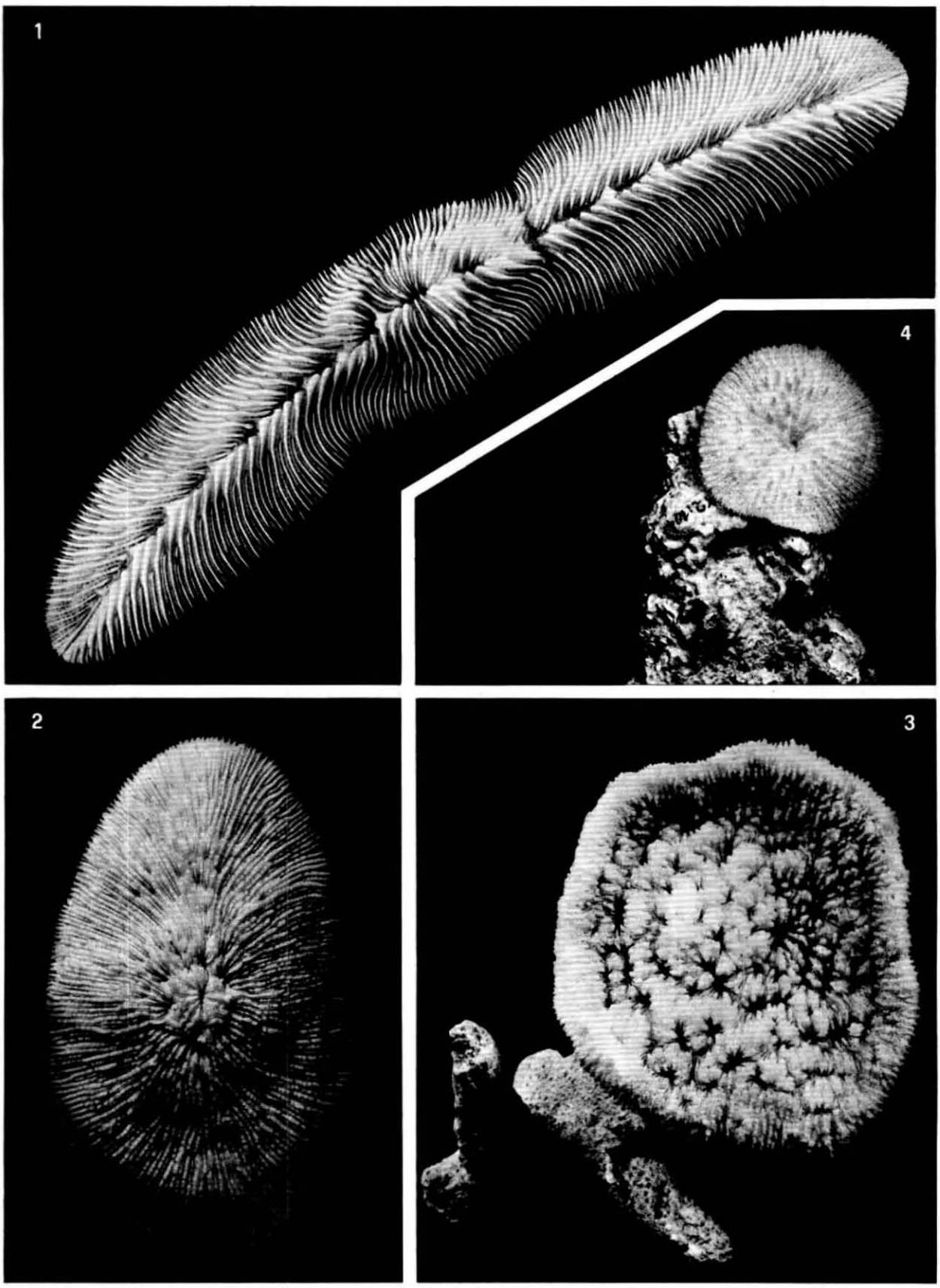


Fig. 1. *Herpolitha weberi*, X2:88–34 (x1).
Fig. 2. *Sandalolitha dentata*, X2:97–11 (x2/3).
Fig. 3. *Sandalolitha robusta*, X2:66–5 (x1).
Fig. 4. *Sandalolitha robusta*, X2:104–13 (x1).

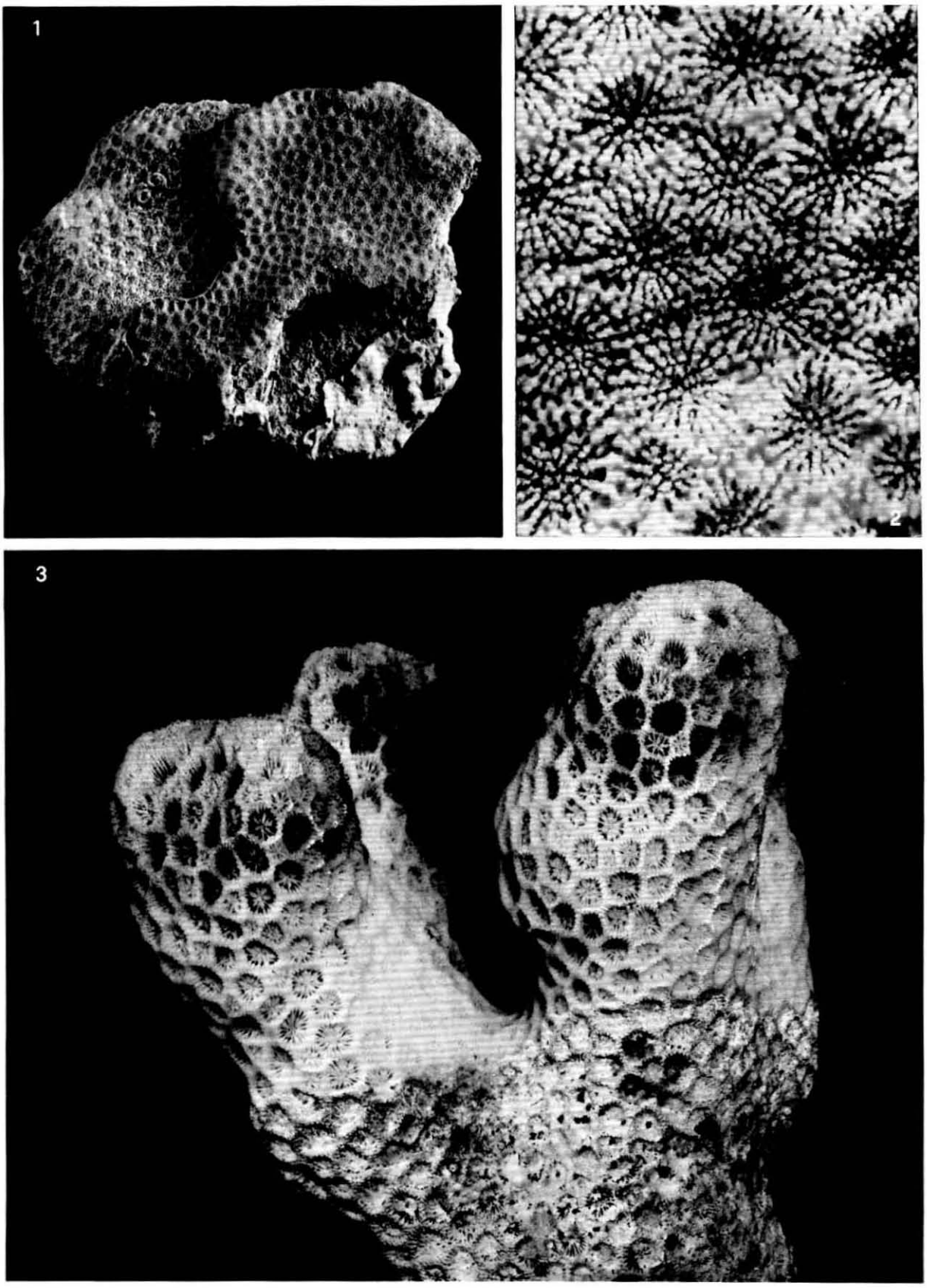
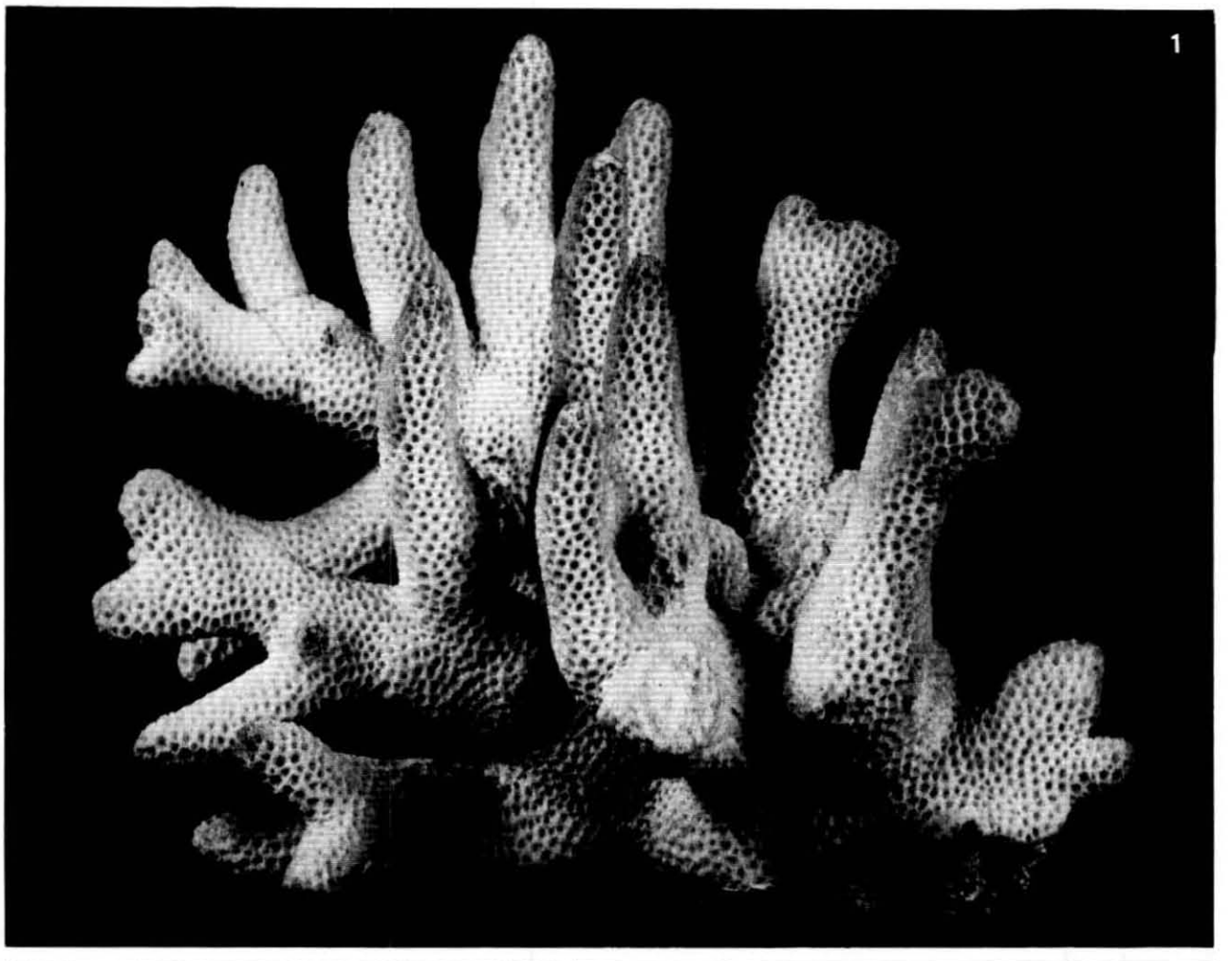
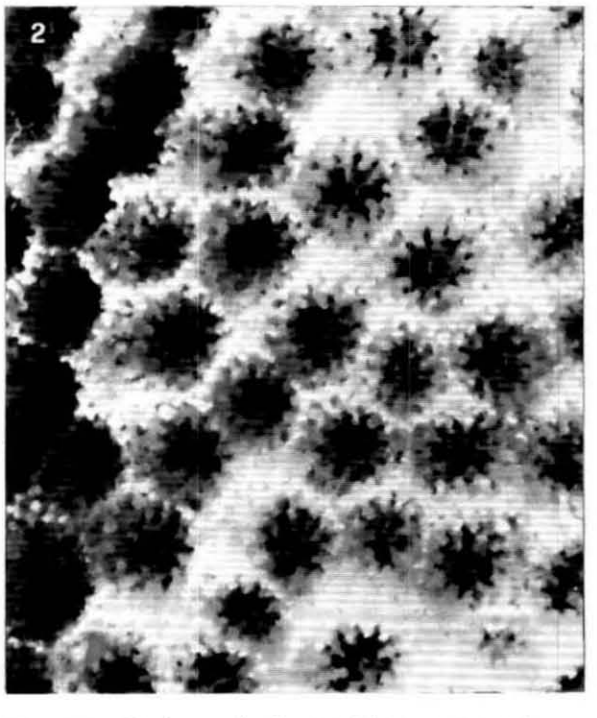
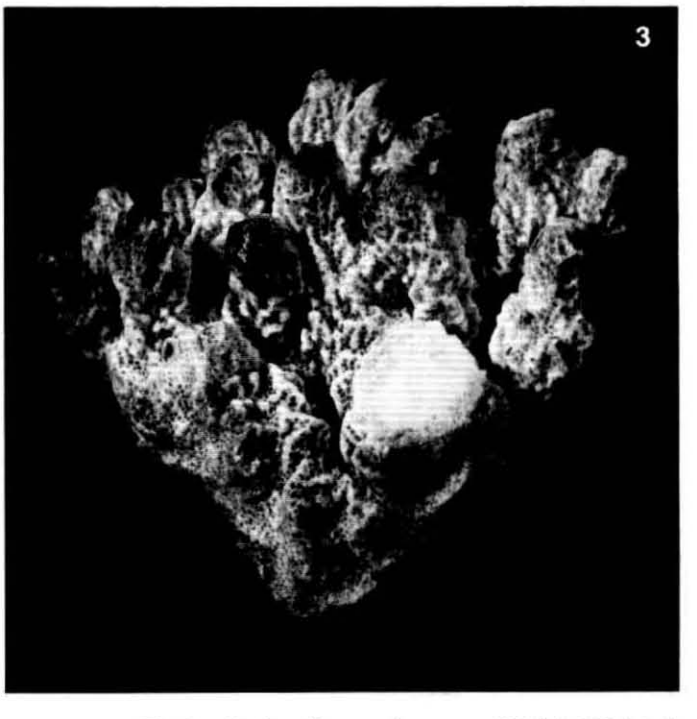


Fig. 1, 2. *Goniopora granulosa*, X2:88–35 (1:x1; 2:x6.5).
Fig. 3. *Goniopora planulata*, X2:66–2 (x1.6).

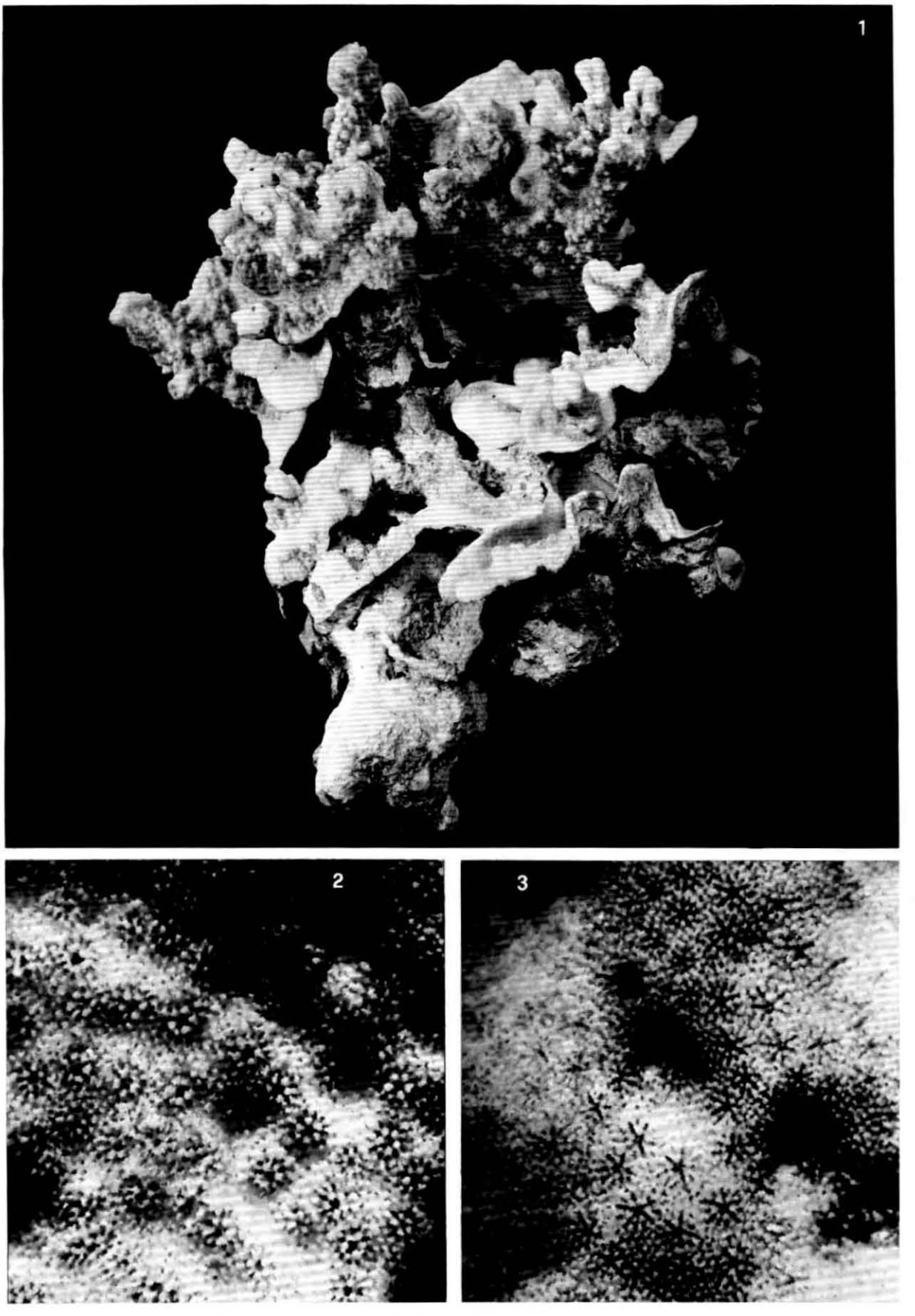






Figs. 1, 2. *Porites profundus*, X2:Sch 37 (1:x1; 2:x8).

Fig. 3. *Porites (Synaraea) convexa*, X2:Sch 9(2) (x1.1).



Figs. 1–3. *Porites (Synaraea) convexa*, X2:92–1 (1:x1; 2, 3:x9.5).

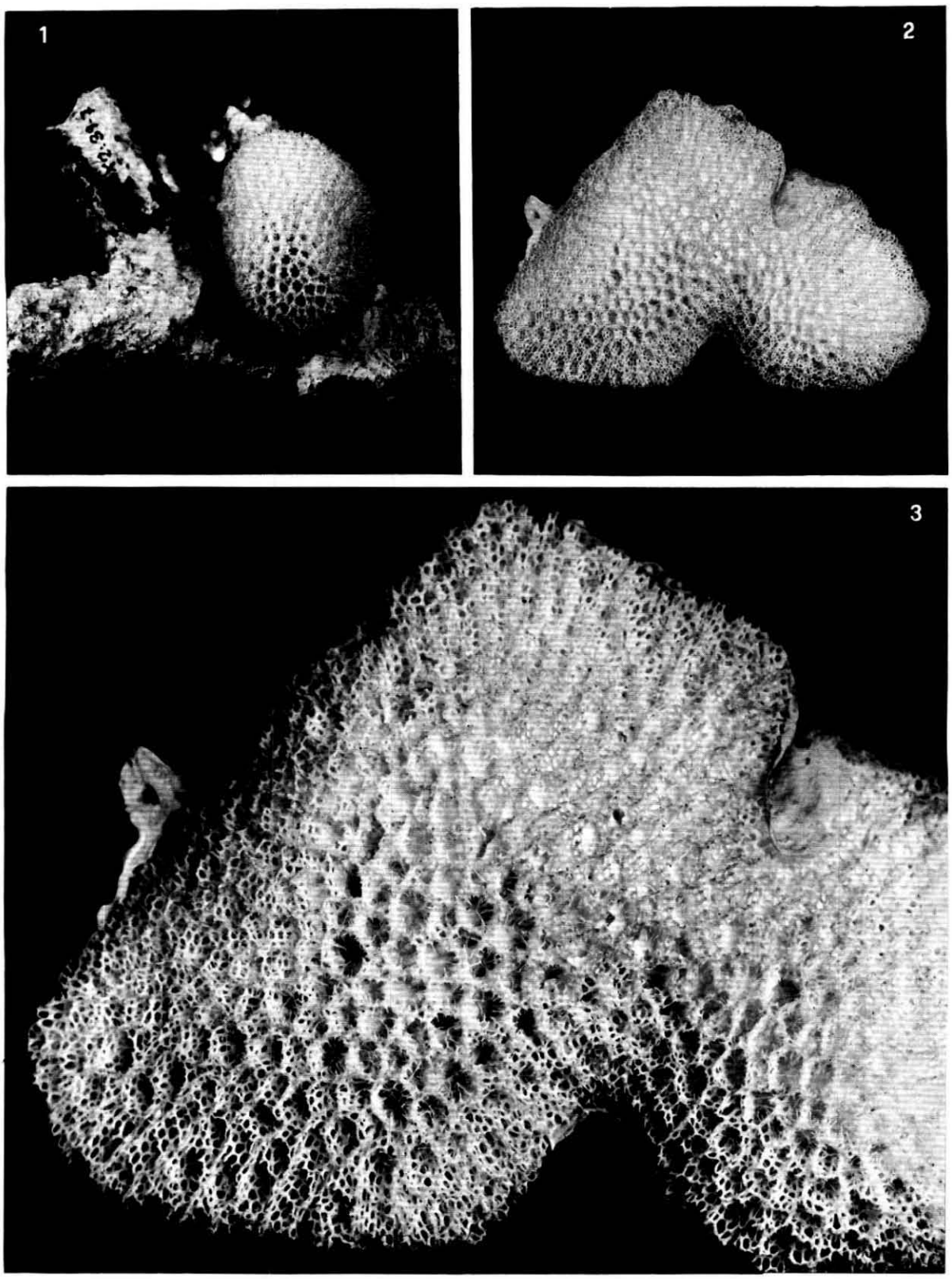
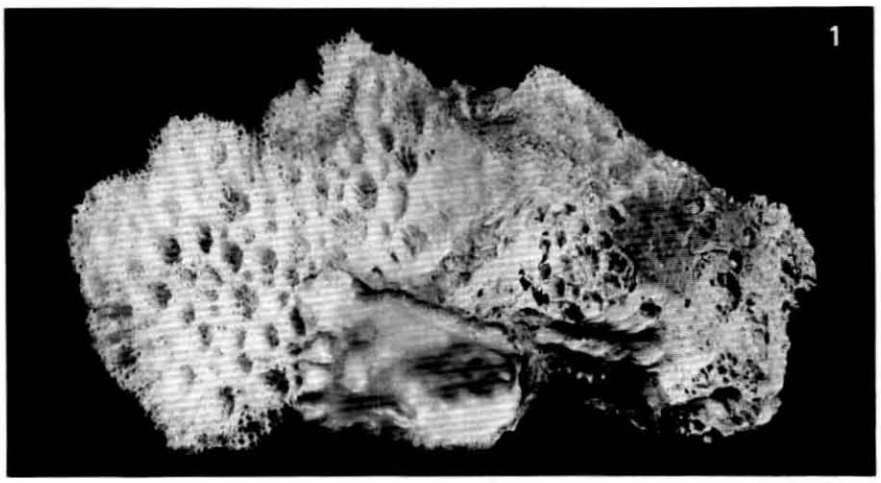
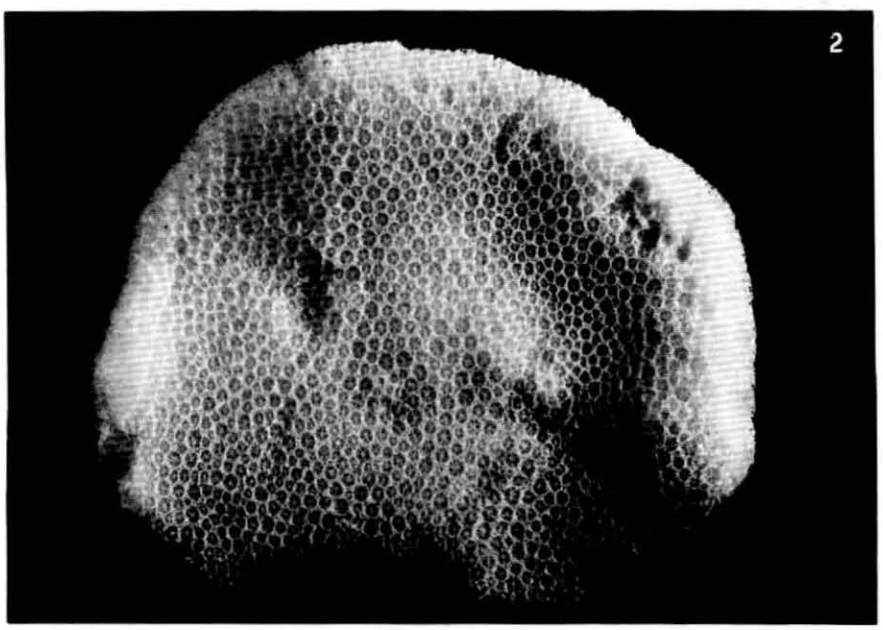
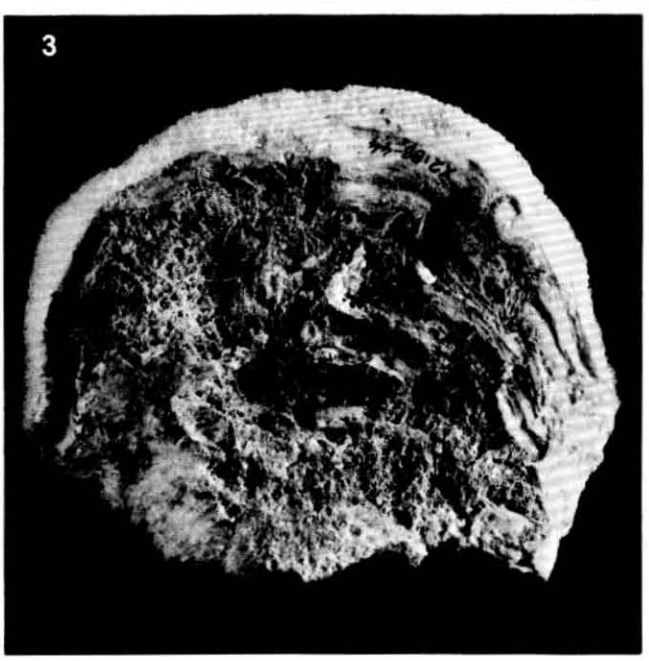


Fig. 1. *Alveopora daedalea*, X2:39–7 (x1).
Figs. 2, 3. *Alveopora mortenseni*, X2:88–49 (2:x0.9; 3:x2.5).







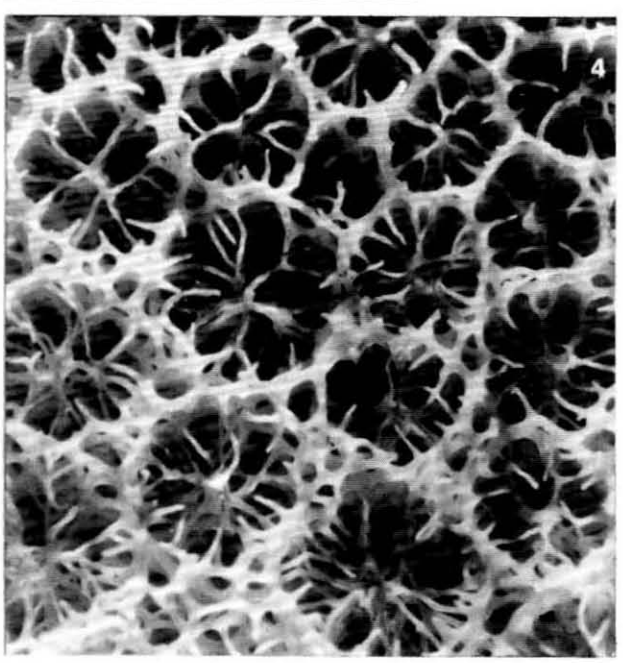
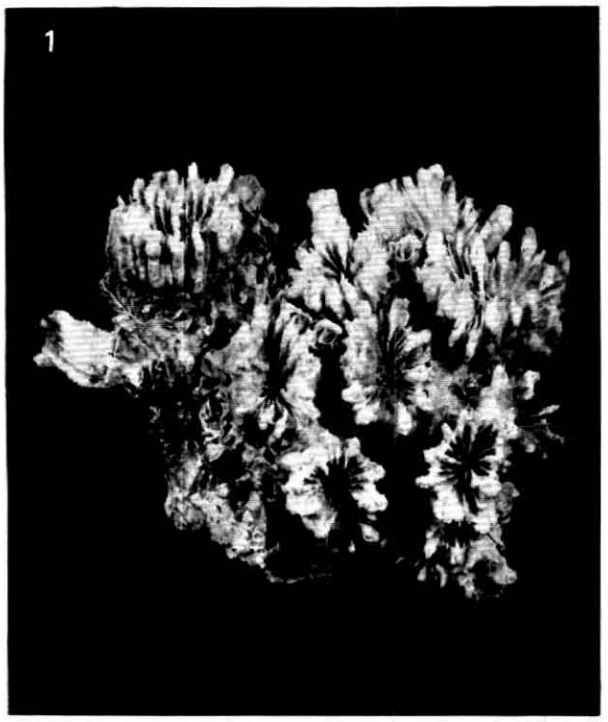
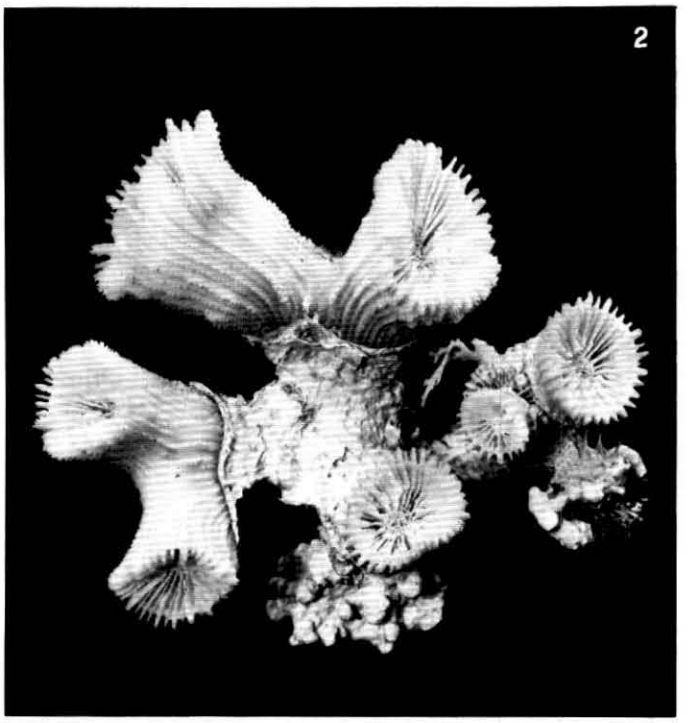


Fig. 1. *Alveopora allingi,* X2:88–31 (x1).
Figs. 2–4. *Alveopora superficialis,* X2:88–44 (2:x1.1; 3, back side:x1; 4:x13).





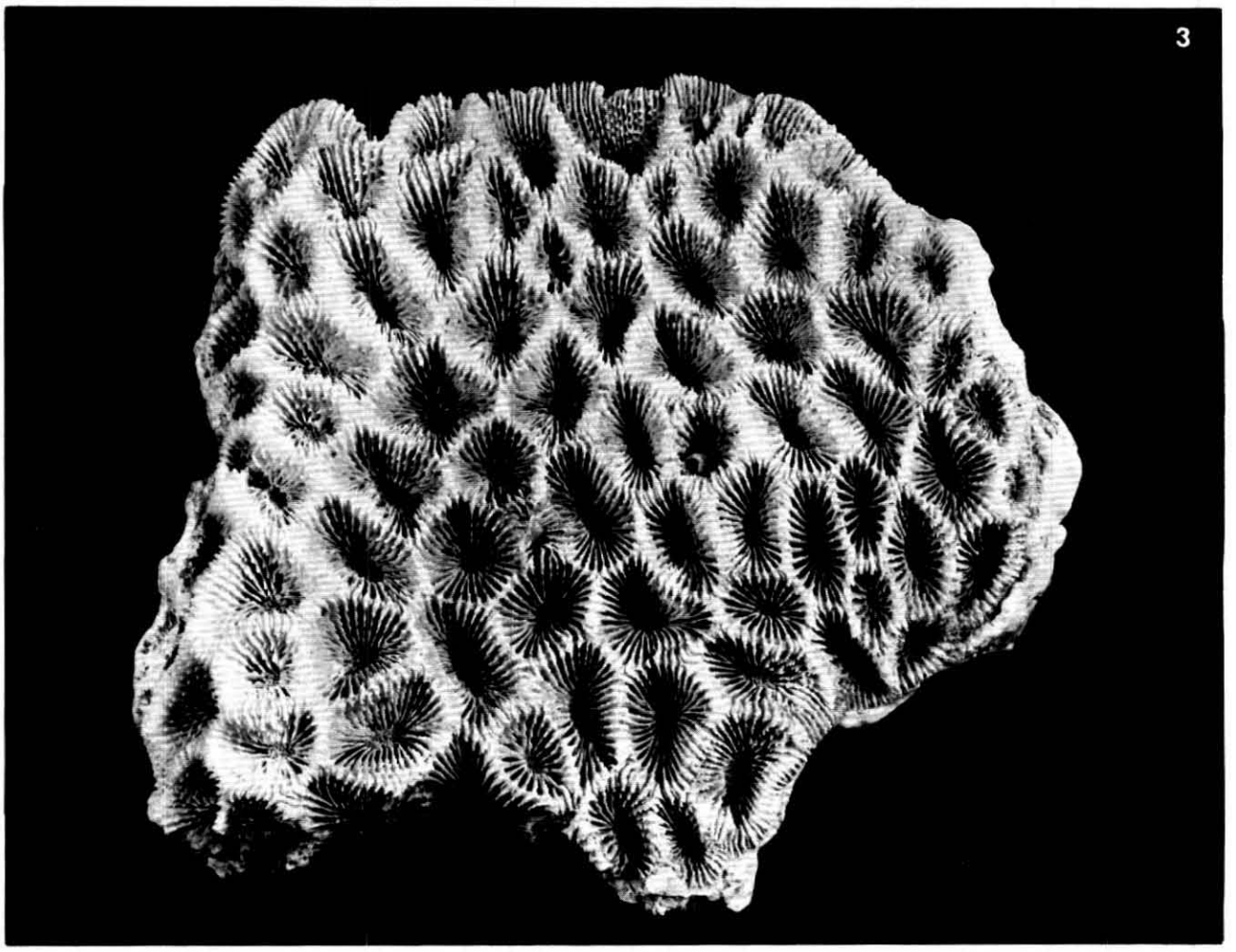


Fig. 1. *Caulastrea furcata*, X2:83–7 (x1).
Fig. 2. *Caulastrea tumida*, X2:88–40 (x1).
Fig. 3. *Favites virens*, X2:41–4 (x1).

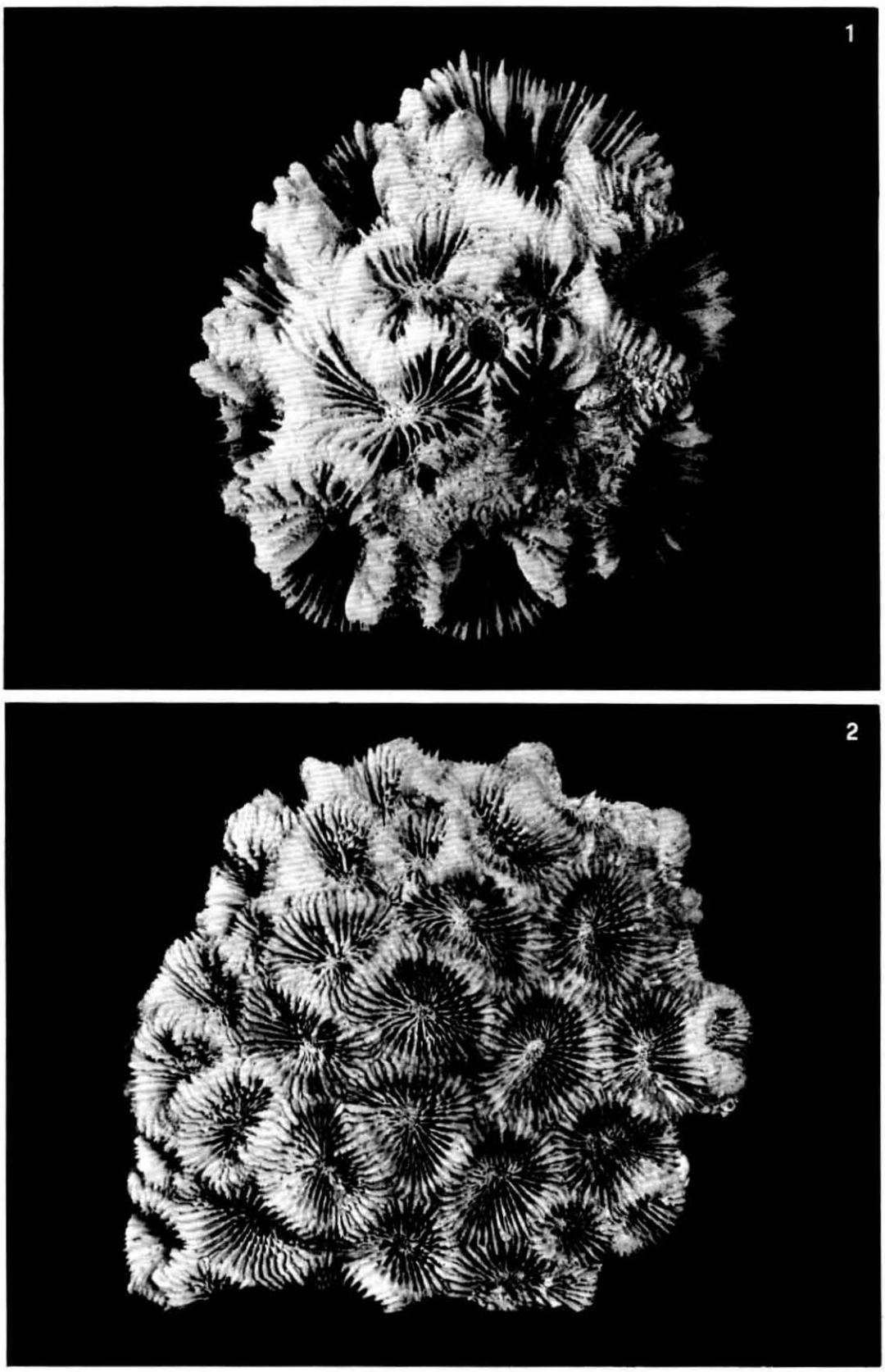
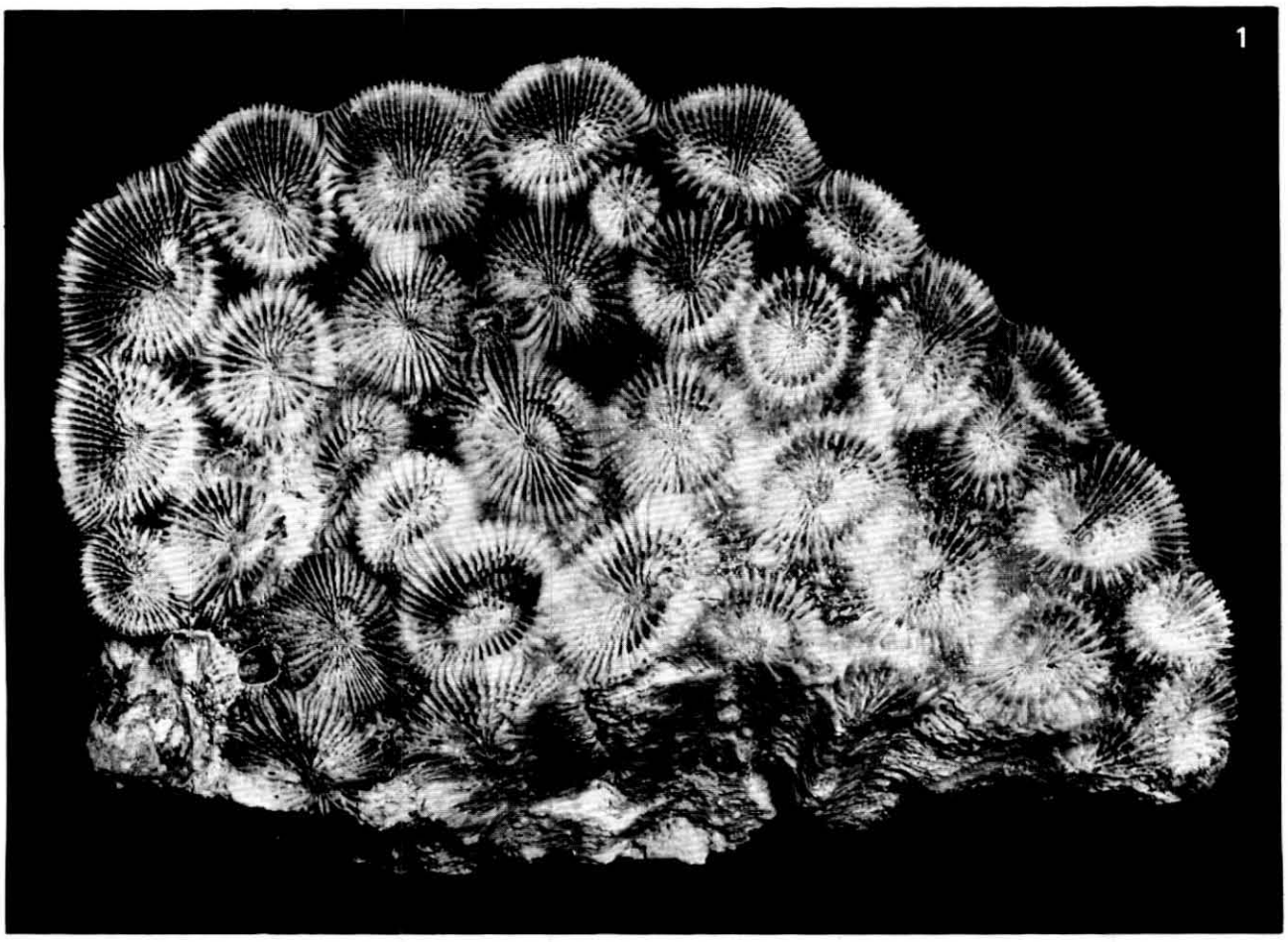


Fig. 1. *Favites flexuosa*, X2:31–19 (x1.2).
Fig. 2. *Favites flexuosa*, X2:50–4 (x1).



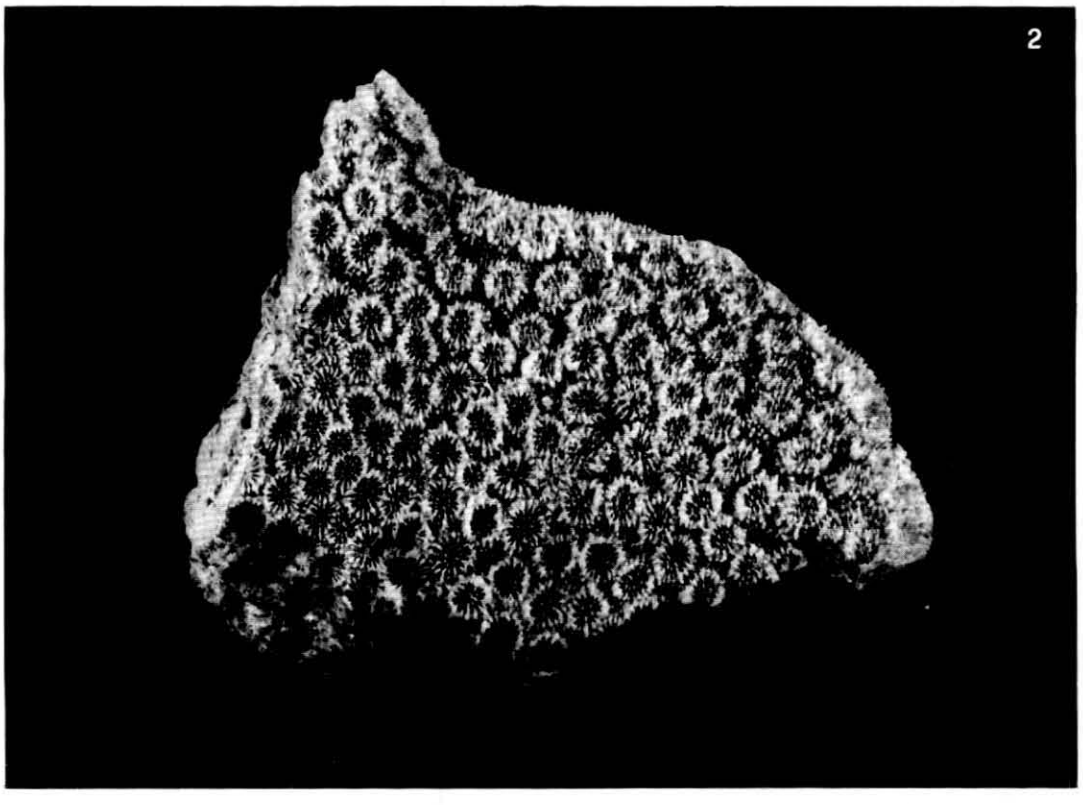


Fig. 1. *Favites flexuosa*, X2:63–4 (x1).

Fig. 2. *Echinopora hirsutissima*, X2:76–11 (x1).

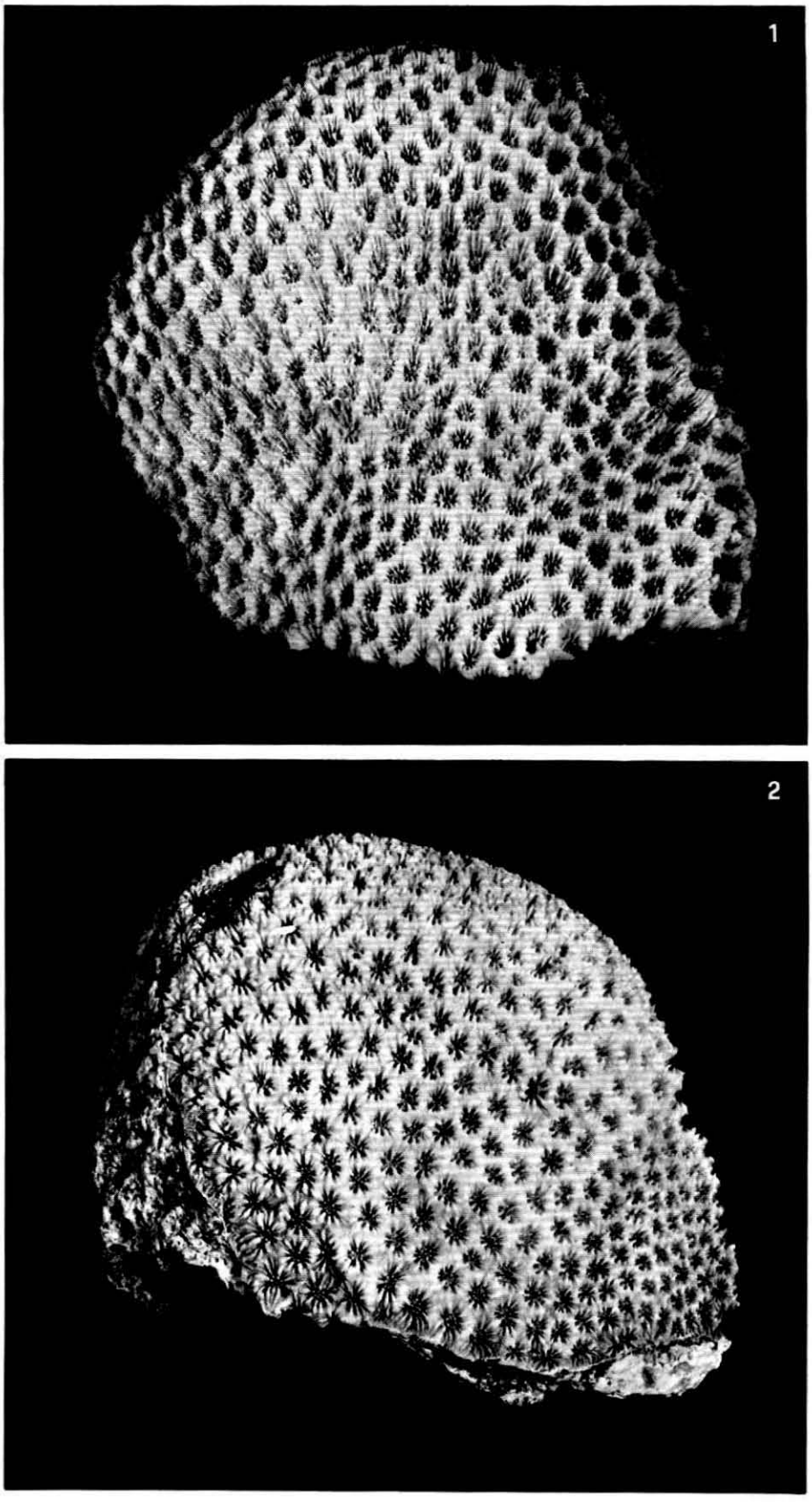
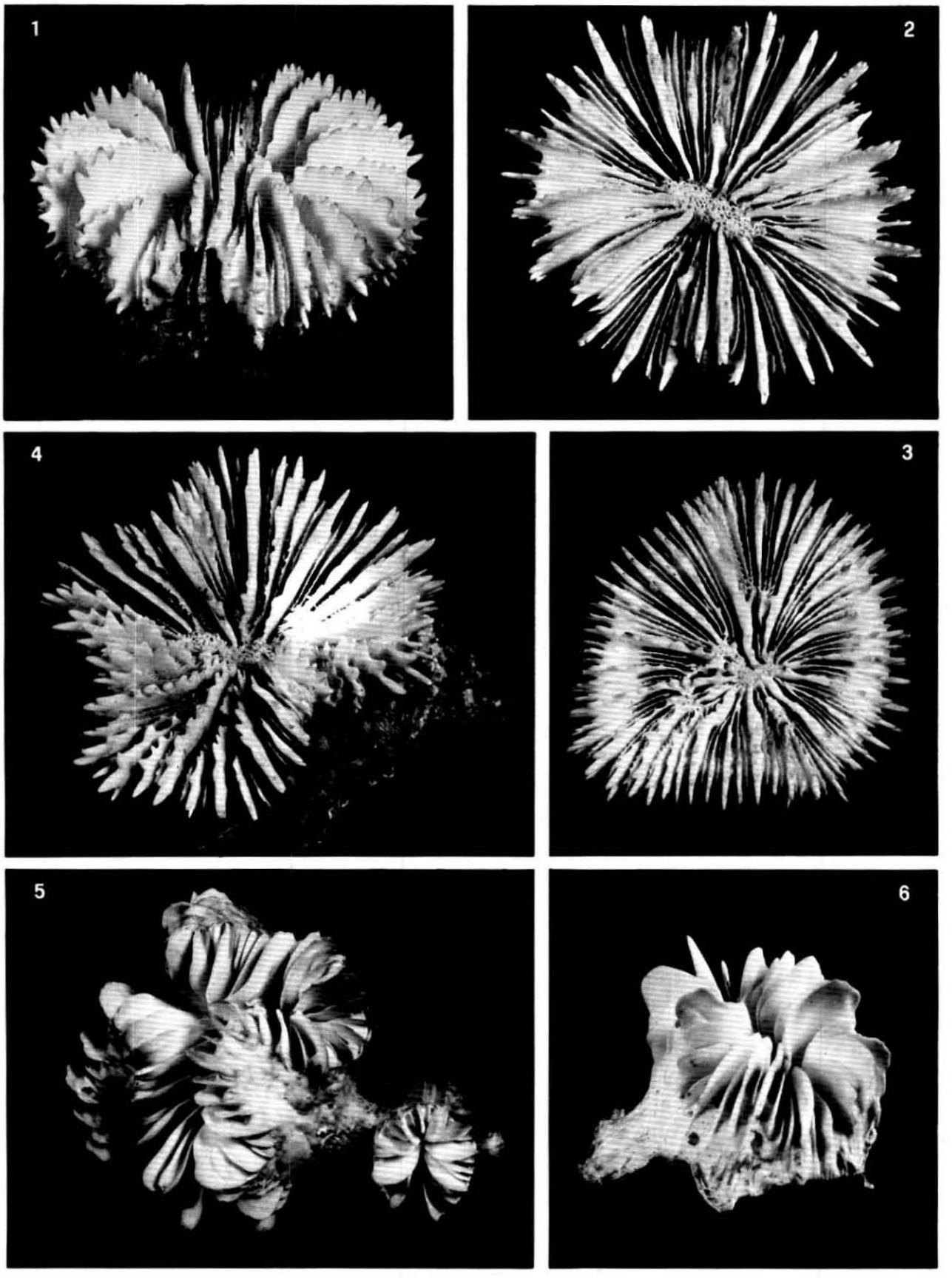


Fig. 1. *Favites melicerum*, X2:61–2 (x1).
Fig. 2. *Favites melicerum*, X2:61–3 (x1).



Figs. 1, 2. *Cynarina lacrymalis*, X2:31–30 (1, 2:x1).
Fig. 5. *Plerogyra sinuosa*, X2:31–12 (x0.9).

Figs. 3, 4. *Parascolymia vitiensis*, X2:31–25 (1 and 3). (3, 4:x1).
Fig. 6. *Plerogyra sinuosa*, X2:31–26(2) (x1).

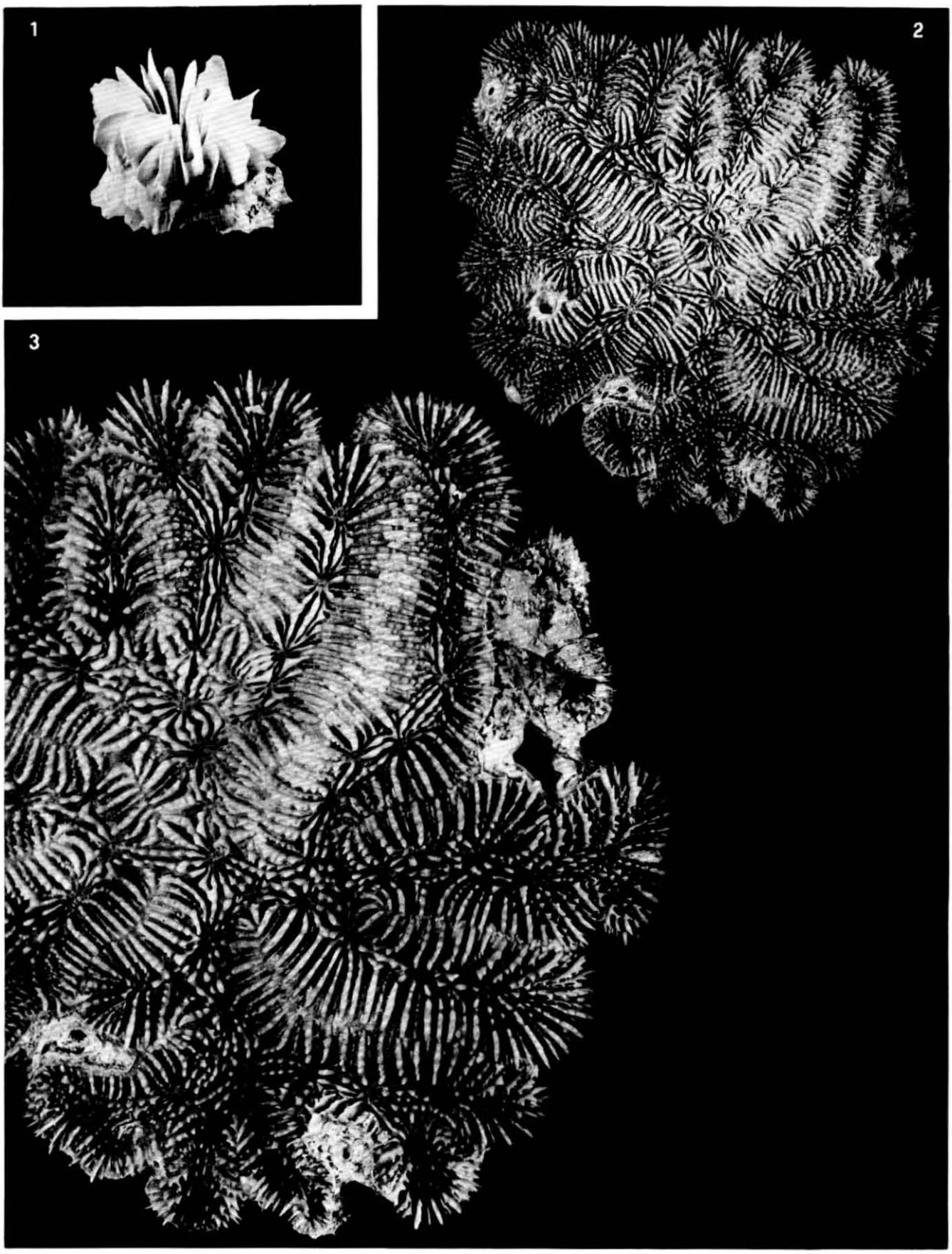
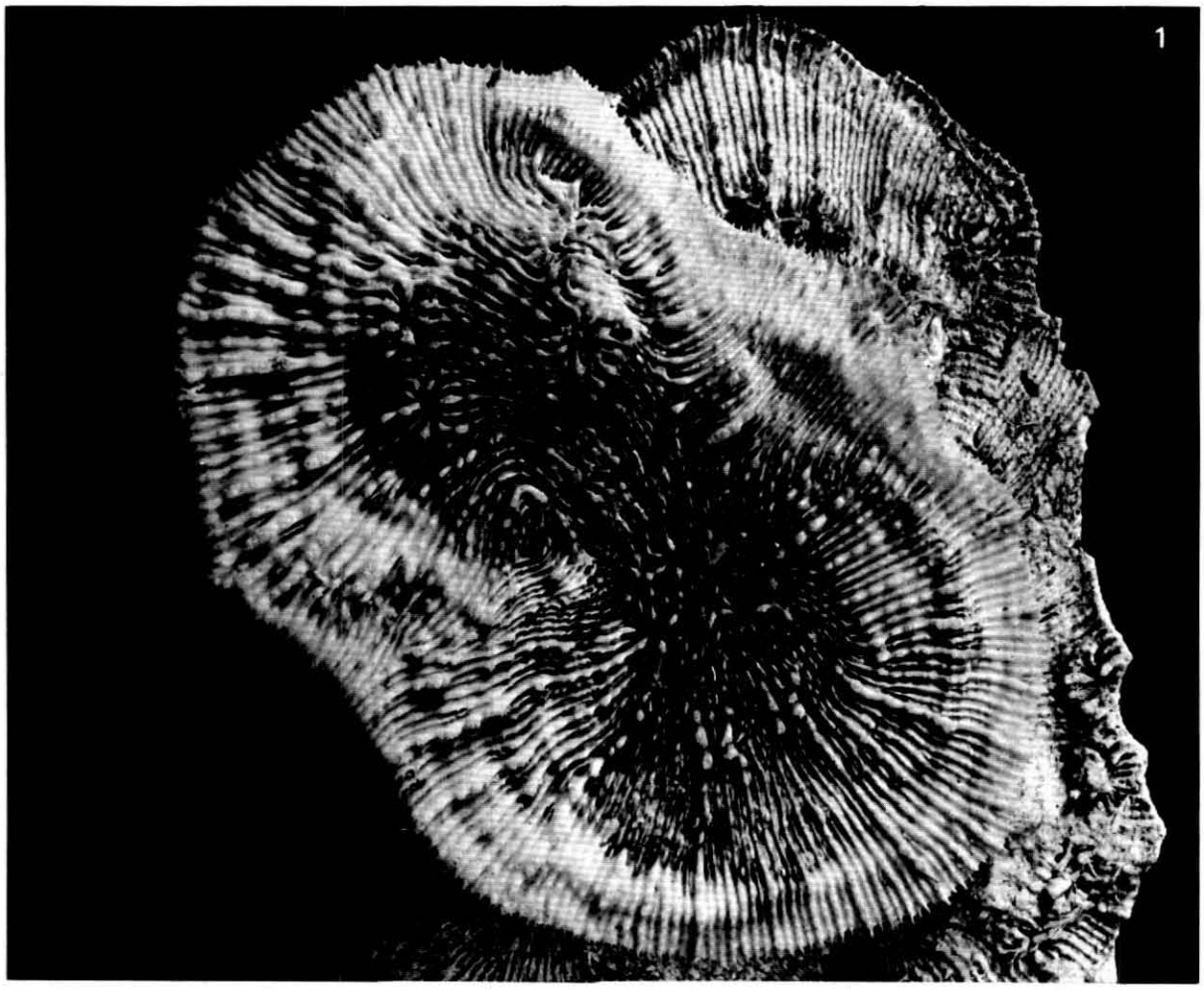


Fig. 1. *Plerogyra sinuosa*, X2:31–26(3) (x1).

Figs. 2, 3. *Symphyllia hassi*, X2:88–6 (2:x0.5; 3:x1).



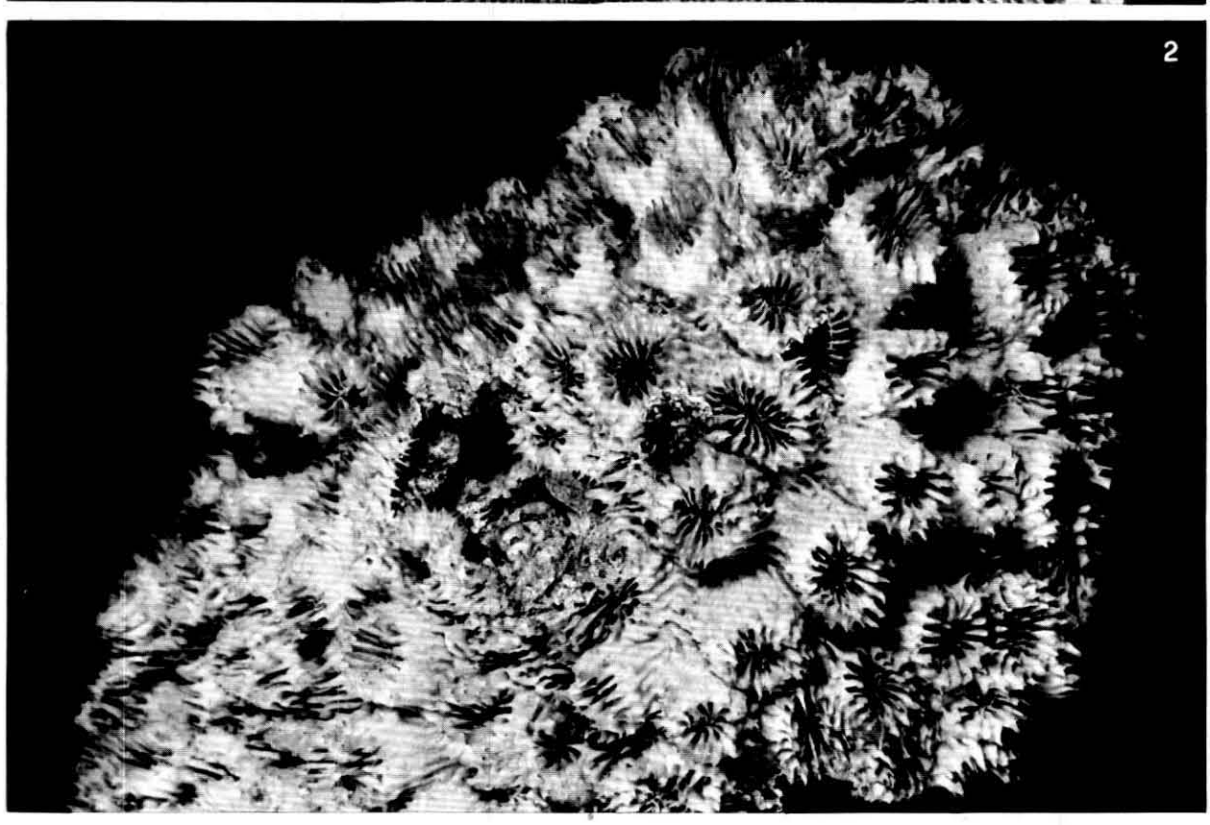


Fig. 1. *Echinophyllia aspera typica*, X2:88–3 (x1).

Fig. 2. *Echinophyllia aspera* var. *sugiyamai*, X2:50–1 (x1).

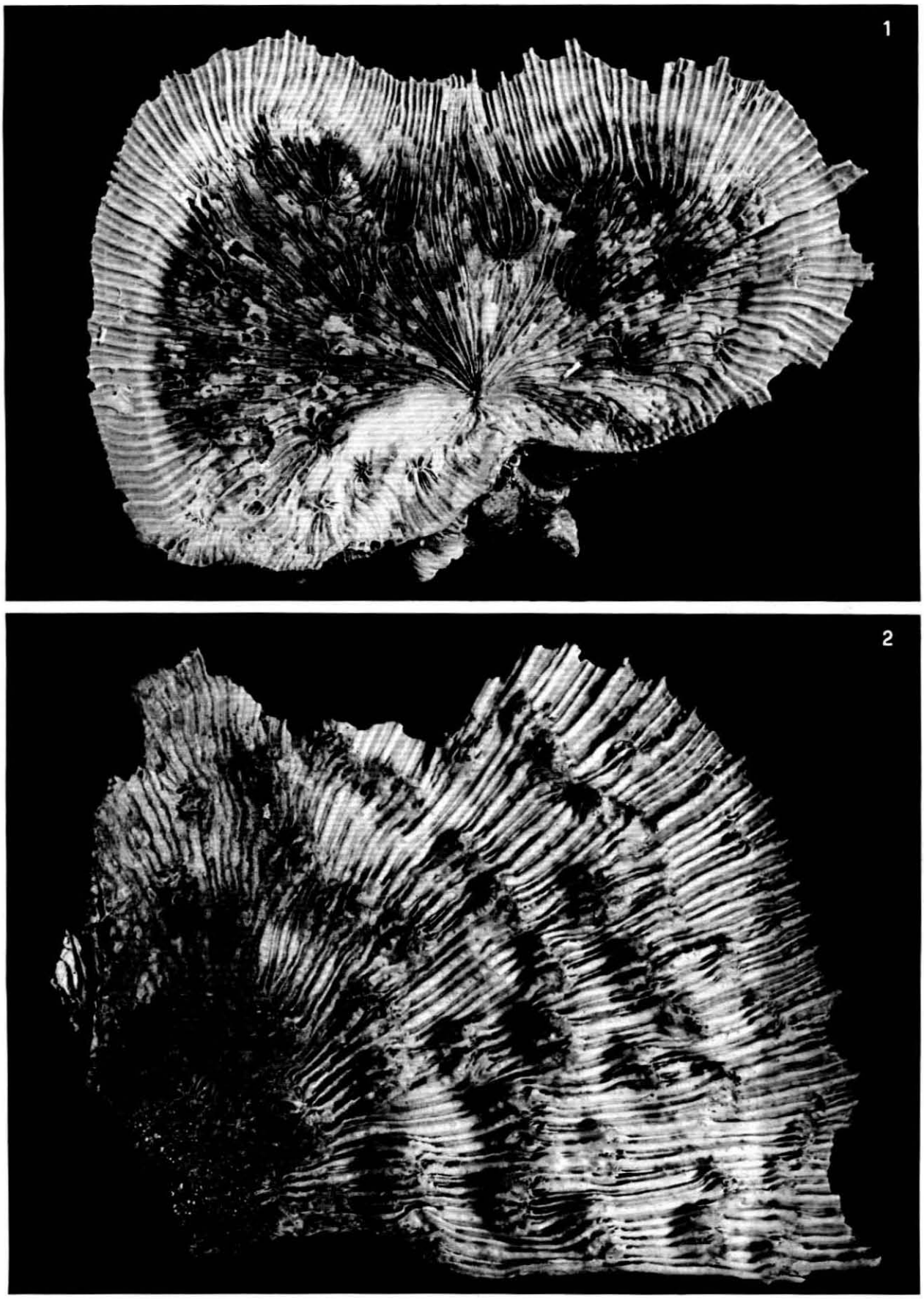
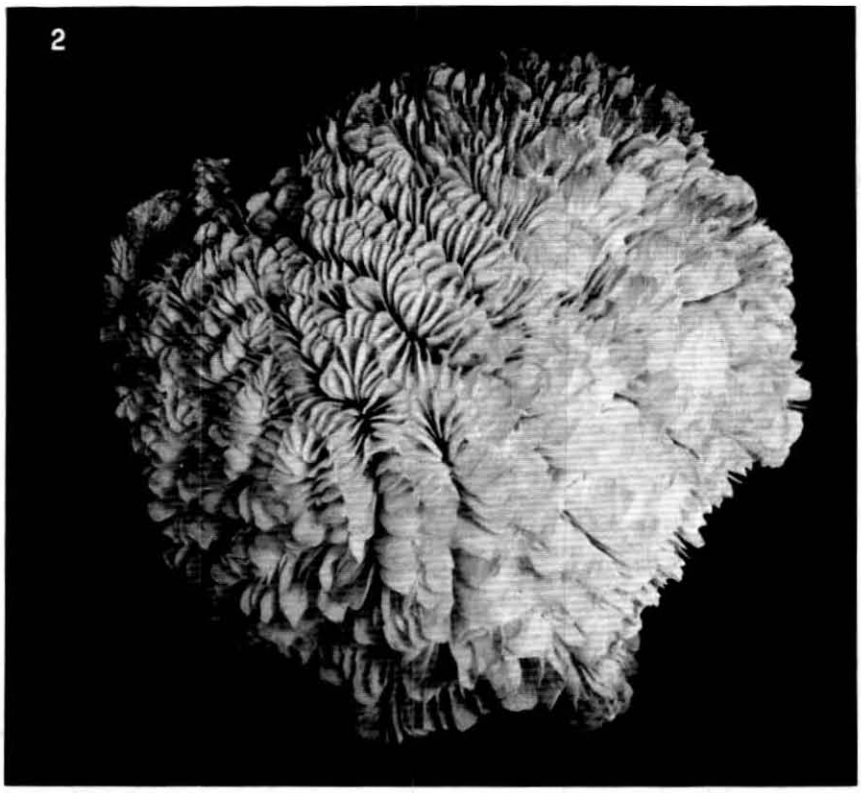
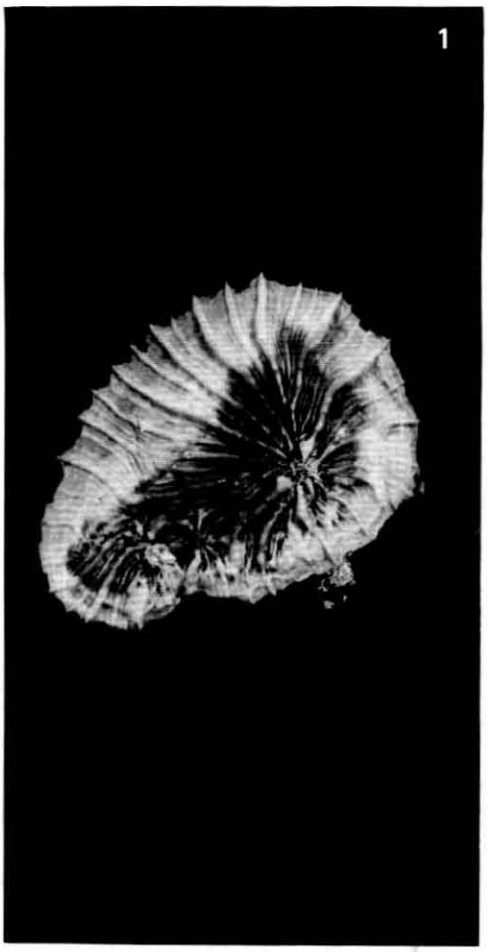
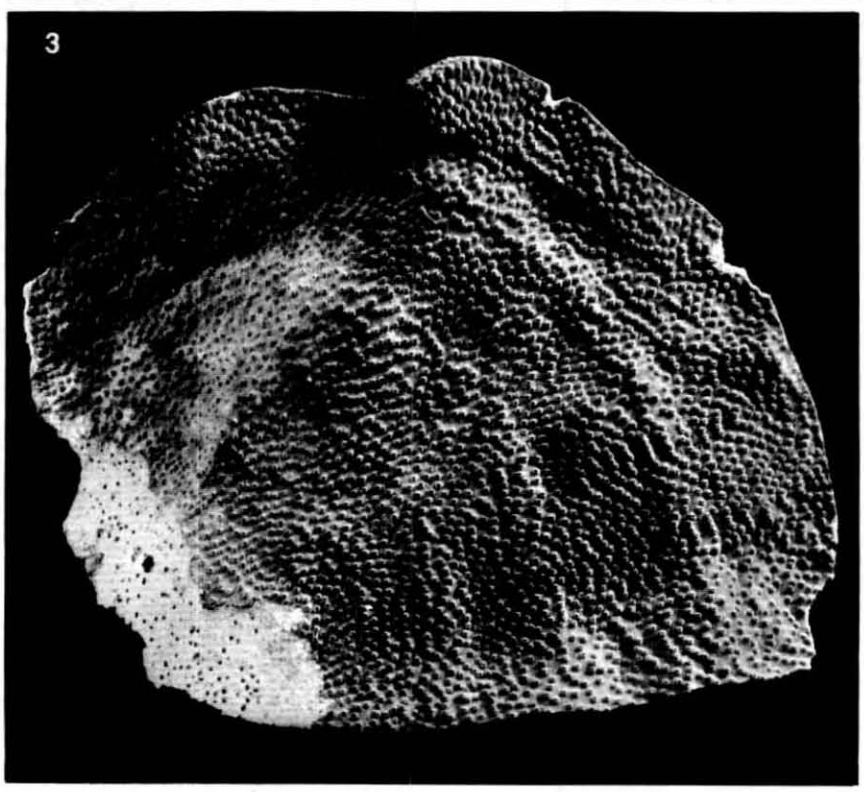


Fig. 1. *Physophyllia ayleni*, X2:88–4 (x1).

Fig. 2. *Mycedium tubifex*, X2:57–4 (x1).







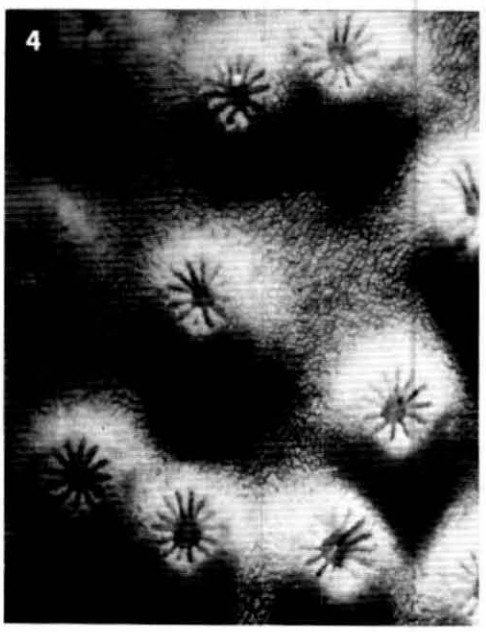


Fig. 1. *Mycedium tubifex*, X2:88–51 (x1).
Figs. 3, 4. *Turbinaria marmorea*, X2:69–4 (3:x1/3, 4:x6).

Fig. 2. *Physogyra lichtensteini*, X2:41–1 (x0.6).