the holotype is known, which has a broken base, the colonial nature of the species is unknown, but the arrangement of paliform lobes (P4), endothecal dissepiments, and epithecal rootlets at the broken pedicel, suggest a placement in *Rhizosmilia*. The holotype is deposited at the BM (1939.7.20.851).

Etymology

The species name *robusta* (from the Latin *robustus*, hard, strong, like oak) is an allusion to the thick pedicels of this species, which contribute to a robust colony.

Distribution

Off Zululand, South Africa; off south-eastern Mozambique; Mozambique Channel off Madagascar; 66–150 m. Type locality: 26°00′S 33°05′E (off south-eastern Mozambique), 135 m.

Family **Turbinoliidae**
Genus *Tropidocyathus*

Tropidocyathus lessoni (Michelin, 1842)

Fig. 7C

Flabellum lessoni Michelin, 1842: 119.
Tropidocyathus lessoni: Gardiner & Waugh, 1938: 194. Cairns, 1989*b*: 33–34, pl. 16 (figs d–l) [synonymy].

New records

MN–ZA51, 1, USNM 91692; MN–ZB24, 1, USNM 91693; MN–ZD4, 1, USNM 91694; MN–ZD6, 2, USNM 91695; MN–ZD7, 4, USNM 91696; MN–ZD8, 6, USNM 91697, 1, SAM–H4583; MN–ZDD3, 4 USNM 91706; MN–ZDD4, 7, USNM 91707, 2, SAM–H4588; MN–ZDD7, 1, USNM 91708; MN–ZH18, 1, USNM 91698; MN–ZH19, 1, USNM 91699; MN–ZH23, 4, USNM 91700; MN–ZH26, 3, USNM 91701; MN–ZK20, 1, USNM 91702; MN–ZK25, 1, USNM 91703; MN–ZV20, 2, USNM 91704; MN–ZV21, 3, USNM 91705.

Remarks

This is a commonly collected south-west Indian Ocean shallow-water azooxanthellate solitary coral, easily distinguished from all other species by its pale-orange corallum and prominent thecal edge crests. *Endopachys grayi* also has edge crests but always has a white corallum, the characteristic porous dendrophylliid theca, and a Pourtalès Plan.

Distribution

Indian Ocean: South Africa from off Natal to Zululand; off south-eastern Mozambique (Cairns 1989*b*); off Zanzibar, Tanzania (Gardiner & Waugh 1938); off Kenya and north-eastern Somalia (Cairns 1989*b*); 62–155 m. Elsewhere: western Pacific from East China Sea to Indonesia; 68–421 m (Cairns 1989*b*).

Genus *Thrypticotrochus*

Thrypticotrochus multilobatus Cairns, 1989*b*

Fig. 7F, I

Thrypticotrochus multilobatus Cairns, 1989*b*: 37, pl. 19 (figs b–g).

New records

AB–365D, 3, USNM 91709; AB–370G, 2, USNM 91710; AB–399A, 1, USNM (lost).

Remarks

All specimens were asexually regenerated from parent fragments, the largest corallum 4,4 mm in calicular diameter.

Distribution

Indian Ocean: off south-western Madagascar; off south-eastern Mozambique; 347–925 m. Elsewhere: South China Sea; Philippines; off south-eastern Australia (Cairns 1989*b*); 130–507 m.

Genus *Sphenotrochus*

KEY TO THE SOUTH-WEST INDIAN OCEAN SPECIES OF *SPHENOTROCHUS*

1A. Each costa composed of a single, elongate ridge 2

1B. Each costa composed of two or more irregular rows of short, narrow ridges .... *S. gilchristi* Gardiner, 1904

2A. Corallum cuneiform but full (appears swollen); full fourth cycle (48) of costae present; columella massive, rising well above upper septal edges .... *S. aurantiacus* von Marenzeller, 1904

2B. Corallum cuneiform but compressed; only four pairs of C_4 present in end half-systems (total = 32); columella only as thick as an S_1 and not as exsert as an S_1 3

3A. Costae rounded, equal in width, and do not overlap adjacent costae; intercostal striae broad (35–55 % width of a costa); corallum triangular, faces diverging at a constant angle from base ..... ***S. exexicostatus*** sp. nov.

3B. Costae flattened, unequal in width, and overlapping adjacent costae; intercostal striae narrow (only 8–18 % width of a costa); corallum roughly rectangular and more highly compressed basally ..... ***S. imbricaticostatus*** sp. nov.

Sphenotrochus (S.) aurantiacus von Marenzeller, 1904

Fig. 6D–E, G–H

Sphenotrochus aurantiacus von Marenzeller, 1904: 280–281, pl. 18 (fig. 15). Wells, 1935: 531. ?Boshoff, 1981: 38–39. Cairns, 1989*b*: 38.

New records

AB–358A, 13, USNM 77185, 1, SAM–H4589, 1, NM; AB–358C, 2, USNM 77182; MN–ZM8, 1, USNM 91719; 2 syntypes of *Sphenotrochus aurantiacus* examined from *Valdivia*–104, ZMB 5095.

Distribution

Agulhas Bank (Von Marenzeller 1904); off Durban and Zululand, South Africa; ?off south-eastern Mozambique (Boshoff 1981); 155–366 m. Bathymetric ranges of Boshoff's specimens not included because his specimens represent a mixed lot of two, if not three, species.

Sphenotrochus (S.) evexicostatus sp. nov.

Fig. 8A–H

?*Sphenotrochus intermedius*: Macnae & Kalk, 1958: 123.
?*Sphenotrochus* sp. Pichon, 1974: 176, text-fig. 5.
Sphenotrochus aurantiacus: Boshoff, 1981: 38–39 [*part.*—3 specimens from off Inhaca, 12 m].

Records

Holotype: AB–372B, 1, USNM 77186. Paratypes: AB–371G, 3, USNM 77194; AB–372B, 43, USNM 91712, 1, SAM–H4584; AB–391J, 6, USNM 77184; AB–392J, 12, USNM 77188; off Inhaca, 12,2 m, 3, USNM 77190.

Description

Corallum medium in size for the genus, the holotype measuring 5,25 × 3,20 mm in calicular diameter and 7,88 mm in height, but larger specimens up to 10,6 mm in height present in type series. Corallum cuneiform, the flat corallum faces diverging at a constant angle of about 12°. Viewed from the side, the corallum is triangular with a gently rounded base. Costae equal in width (0,15–0,17 mm), rounded, and smooth, only the principal C_1 and their adjacent C_4 being somewhat granular (Fig. 8H). Most costae continuous from calice to about 1,5 mm from base, where they either terminate or transform into discontinuous ridges. Costae usually not vertical in arrangement, but slanted inward toward the sand-grain substrate incorporated into its base. Intercostal striae broad and open, about 0,06–0,10 mm wide, or 35–55 per cent width of a costa, affording an easy view of underlying corallum theca (Fig. 8D–E). Freshly preserved coralla light yellow to brown.

Septa hexamerally arranged in three cycles. Pairs of C_4 occur in each half-system adjacent to the two principal septa (total = 32 costae), but rarely in half-systems beyond these, but septa (S_4) do not correspond to these costae. S_1 and S_2 equal in size, moderately exsert, and extend about three-quarters distance to columella, merging with columella only lower in fossa. Inner edges of S_1 and S_2 slightly sinuous. S_3 slightly less exsert and only about one-third width of S_1 and S_2. Septa and columella bear low, inconspicuous granules, producing relatively smooth faces.

Columella a solid, sharp-edged lamella rising almost to height of exsert septa, and of equal thickness to an S_1 (i.e. 0,15–0,16 mm).

Remarks

Although *S. evexicostatus* sp. nov. is of approximately the same size as *S. imbricaticostatus* sp. nov., has the same arrangement of septa and costae, similar columella, and they are often found living together, *S. evexicostatus* is distinguished by its rounded, non-imbricate costae of equal width, wider intercostal striae, smaller S_3 in relation to the S_1 and S_2, and smoother septal and columellar faces. *Sphenotrochus*

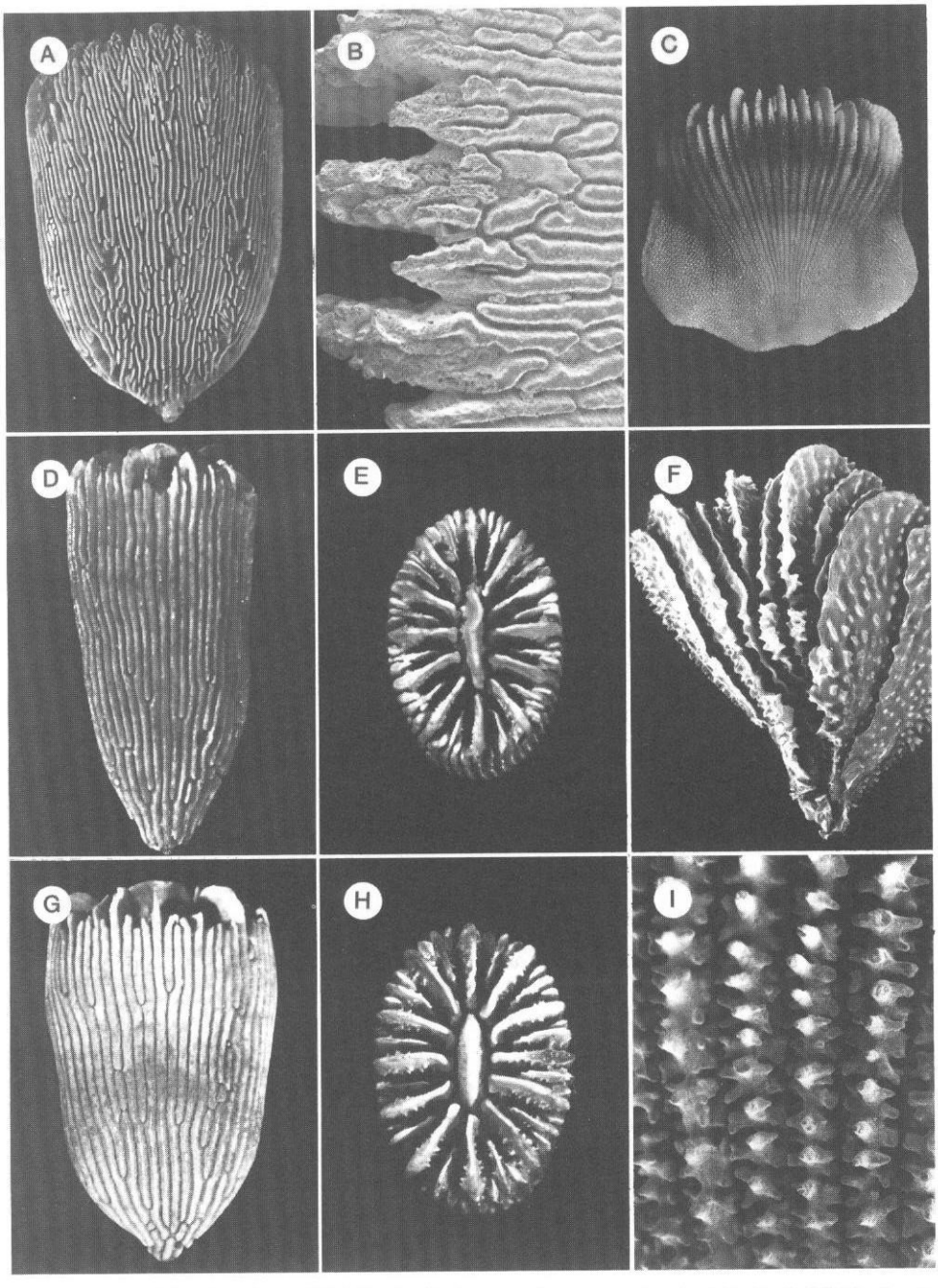

Fig. 7. A–B. *Sphenotrochus gilchristi*. A. *S. dentosus* (*nomen nudum*) of Boshoff (1981), South Africa, South African Museum. B. *Vema* 19–28, USNM 87610, costal granulations near calice. × 24. C. *Tropidocyathus lessoni*, MN–ZH18, USNM 91698, lateral view showing alate end costae. × 2,5. D–E, G–H. *Sphenotrochus aurantiacus*. D–E. Syntype from *Valdivia*–104, ZMB 5095, lateral and calicular views. D × 6,6, E × 10. G–H. AB–358A, USNM 77185, lateral and calicular views. G × 6,2, H × 8,0. F, I. *Thrypticotrochus multilobatus*, AB–365D, USNM 91709, corallum fragment. × 10,5, and enlargement of costae. × 35.

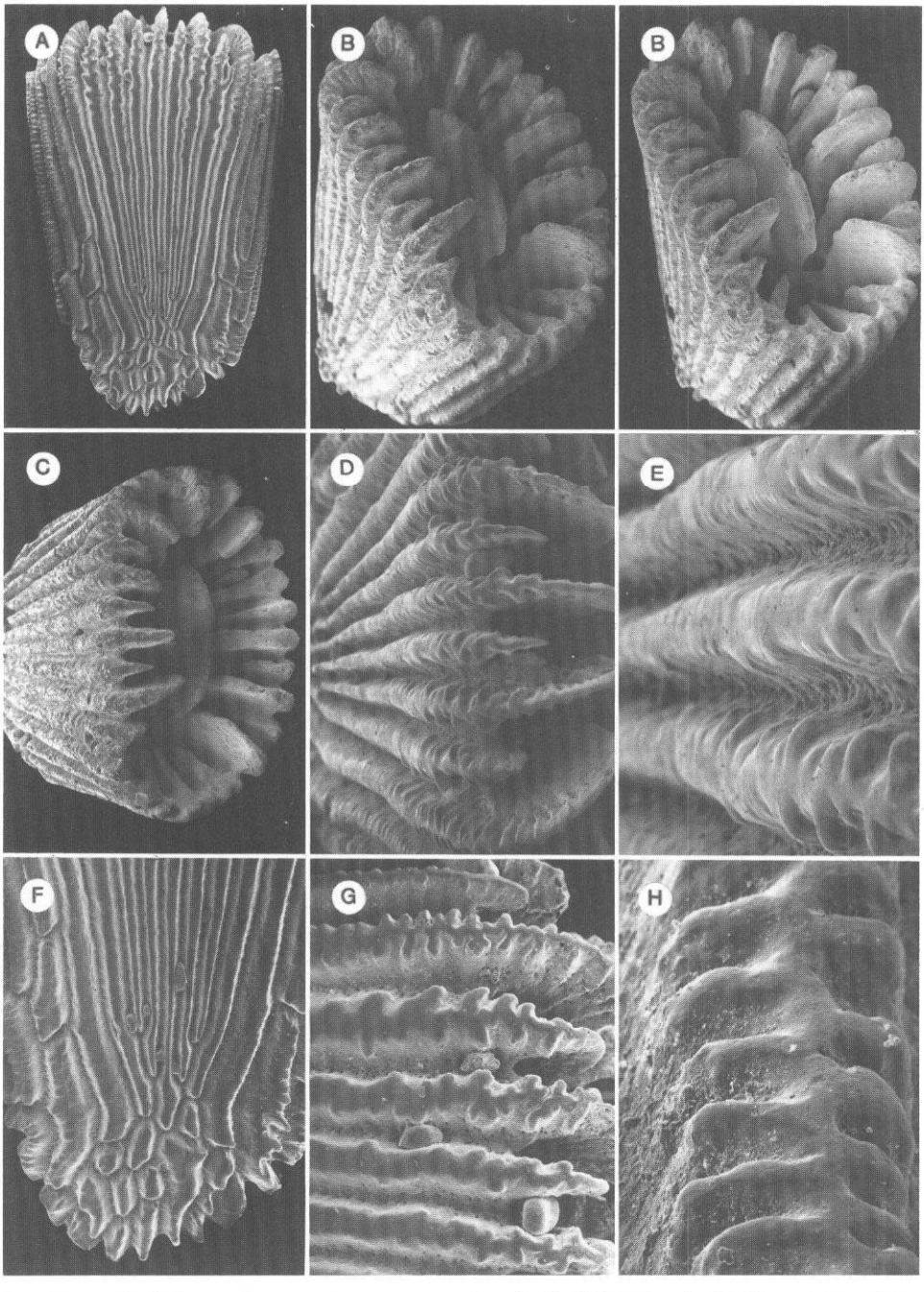

Fig. 8. A–H. *Sphenotrochus evexicostatus* sp. nov. (B–C, holotype; A, D–H, paratype from AB–392J). A. Lateral view of corallum. × 9,0. B. Stereo view of calice. × 11. C. Oblique view of calice. × 10. D–E. Longitudinal views of costae showing broad intercostal furrows and rounded costae. D × 24, E × 71. F–G. Costal details at corallum base and near calice. F × 16, G × 32. H. Granulated edge costa. × 175.

evexicostatus sp. nov. bears some resemblance to *S. andrewianus* Milne Edwards & Haime, 1848 (eastern Atlantic, 12–105 m), in size and shape, but differs in having some pairs of C_4, a more compressed corallum, and a consistently lamellar columella.

Etymology

The species name *evexicostatus* (from the Latin *evexus*, rounded at the top + *costatus*, having rib-like ridges) refers to the costae of this species, which are evenly rounded on top.

Distribution

Off South Africa from Durban to south-eastern Mozambique; ?off Madagascar (Pichon 1974); 12,2–73 m. Type locality: 24°48′S 34°59′E (off south-eastern Mozambique), 42 m.

Sphenotrochus (S.) imbricaticostatus sp. nov.

Fig. 9A–H

Sphenotrochus aurantiacus: Boshoff, 1981: 38–39 [*part.*—9 specimens from off Inhaca, 12,2 m].

Records

Holotype: MN–ZB27, 1, USNM 91715. Paratypes: AB–370G, 12, USNM 77183; AB–370H, 21, USNM 77181; AB–372B, 36, USNM 91716, 2, SAM–H4586; AB–372L, 29, USNM 77187; AB–372P, 20, USNM 77189; AB–391J, 2, USNM 91717; AB–392J, 7, USNM 91718; Inhaca, Mozambique, 12,2 m, 9, USNM 77190, and 24, currently deposited at Station Marine d'Endoume, Marseille.

Description

Corallum small, largest specimen (holotype) only 3,68 × 2,47 mm in calicular diameter and 6,55 mm in height. Corallum cuneiform: highly compressed in lower corallum where opposite faces are essentially parallel; upper corallum slightly flared. Viewed from the side, corallum is often rectangular (Fig. 9A, C), with only a slight rounding of the basal edges. Costae smooth, flat, and oriented vertically, most continuous from calice to base. In well-preserved coralla, 12–14 costae slightly overreach the base and meet their counterparts from the opposite face. Costae alternate in width near calicular edge, C_3 (0,30–0,35 mm wide) being broader than the C_1 and C_2 (0,14–0,18 mm wide, Fig. 9F–G). Intercostal striae narrow (0,030–0,035 mm wide), or only 8–18 per cent of costal width, not affording a view of underlying theca. Each costa has a thin (0,018–0,020 mm) lateral extension (Fig. 9G), which overlaps the extension of its two adjacent costae in alternating fashion such that the C_3 extensions are invariably higher than those of the C_1 and C_2 near the calicular edge. Lower on theca, the situation is reversed. These lateral costal extensions are particularly broad (up to 0,1 mm) on the lower, outer edges of the four C_2 near the principal C_1 and their adjacent C_4 near the base of the corallum (Fig. 9H). Colour of a fresh corallum light brown; theca procellaneous.

Septa hexamerally arranged in three complete cycles (24 septa). Pairs of C_4 occur in each half-system adjacent to the two principal S_1 (total = 32 costae), but S_4 do not correspond to them inside calice. S_1 and S_2 equal in size, moderately exsert, and

extend about four-fifths distance to columella, joining with columella only lower in fossa. Inner edges of S_1 and S_2 slightly thickened. S_3 equally exsert but only three-quarters as wide as S_1 and S_2. All septa, as well as columella, covered with tall (up to 0,060 mm), slender spines.

Columella a solid, sharp-edged lamella rising almost to height of exsert septa, equal to or slightly thicker (about 0,1 mm) than S_1 and S_2. Viewed from the side, the columella is rectangular.

Remarks

Sphenotrochus imbricaticostatus sp. nov. is distinguished from the nine other Recent species in the genus (eight listed by Cairns 1989*b*: 38, plus *S. evexicostatus* sp. nov.) by its extremely compressed rectangular–cuneiform corallum and its wide, flat costae, which alternate in width and imbricate with edges of adjacent costae.

Etymology

The species name *imbricaticostatus* (from the Latin *imbricatus*, overlapping + *costatus*, having rib-like ridges) is an allusion to the distinctive imbricate costae of this species.

Distribution

Off Durban, South Africa to south-eastern Mozambique; 37–347 m. Type locality: 27°03,9′S 32°53,0′E (off Zululand, South Africa), 44 m.

Sphenotrochus (Eusthenotrochus) gilchristi Gardiner, 1904

Fig. 7A–B

Sphenotrochus gilchristi Gardiner, 1904: 98–99, pl. 1 (figs a–g). Zibrowius & Gili, 1990: 44.
Eusthenotrochus moseri Wells, 1935: 530–532, pl. 18 (figs 5–6).
Sphenotrochus dentosus Boshoff, 1981: 39 (*nomen nudum*).
Sphenotrochus sp. (*incertae sedis*) Boshoff, 1981: 39 [= *S. 'dentosus'*].

New records

AB–358A, 3, USNM 77191; AB–392J, 2, USNM 77192; *Vema* 19–28, 1, USNM 87610; *Sardinops* CD32, 1, USNM 91714, 1, SAM–H4590.

Remarks

Three specimens identified as *S. dentosus* by Boshoff (1981) were borrowed from the ORI and found to be typical *S. gilchristi*.

Distribution

Agulhas Bank (Wells 1935); off Durban and Simon's Town; 24–165 m.

Genus *Peponocyathus*

Peponocyathus australiensis (Duncan, 1870)

Deltocyathus italicus var. *australiensis* Duncan, 1870: 297.
Deltocyathus minutus Gardiner & Waugh, 1938: 198, text-fig. 15. Scheer & Pillai, 1983: 156.
Peponocyathus australiensis: Cairns, 1989*b*: 30–32, pl. 14 (figs d–j), pl. 15 (figs a–d) [synonymy].

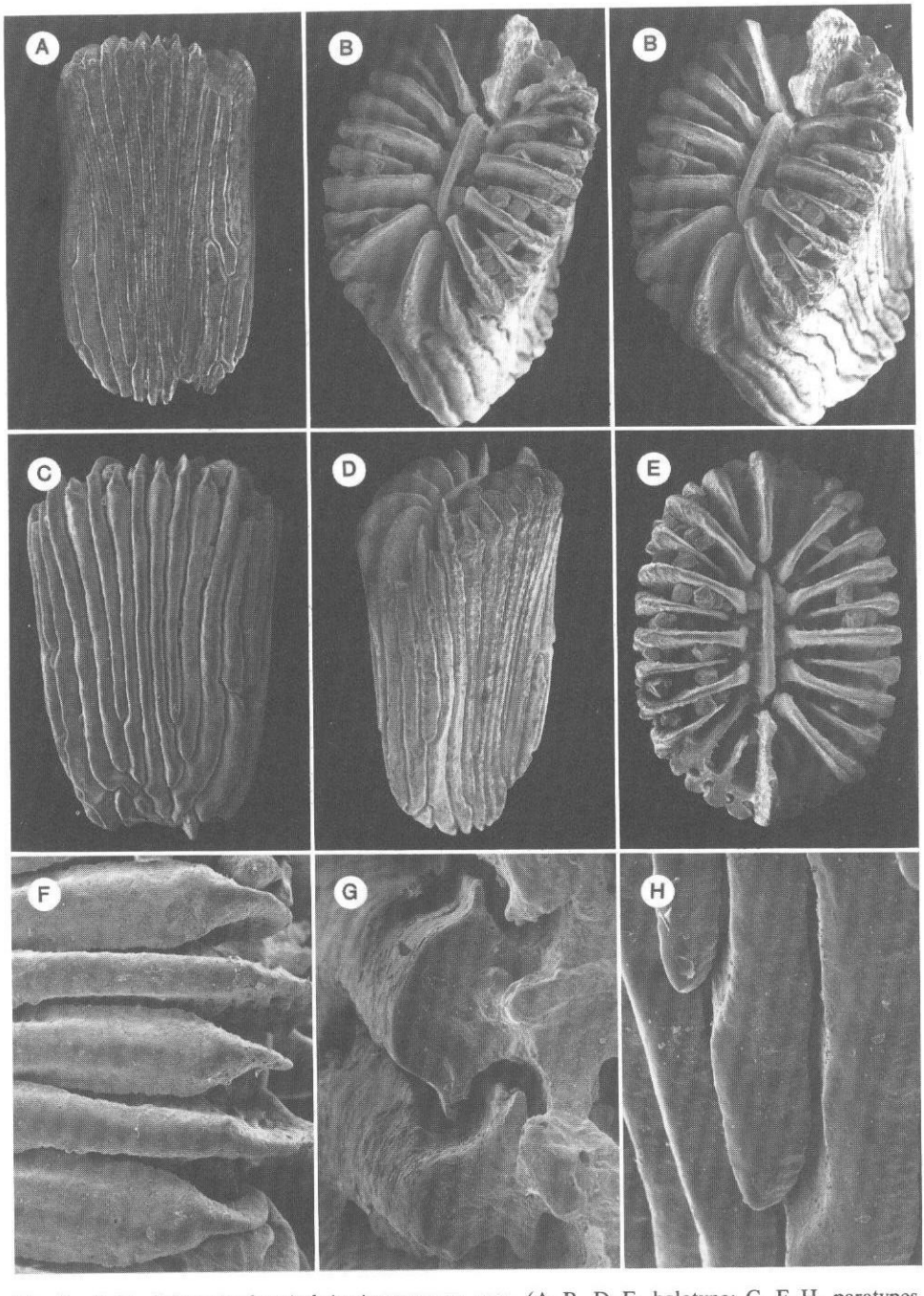

Fig. 9. A–H. *Sphenotrochus imbricaticostatus* sp. nov. (A–B, D–E, holotype; C, F–H, paratypes from AB–372P). A, C. Lateral views. A × 8,3, C × 11. B. Stereo view of calice at oblique angle, × 14,5. D. Oblique lateral view of corallum, × 9,7. E. Calicular view, × 15,5. F–G. Imbricate costae near calicular edge (exterior and cross sectional views). F × 41, G × 110. H. Imbricate costae near corallum base. × 60.

New record

AB–390S, 2, USNM 91711.

Distribution

Indian Ocean: off Natal, South Africa; off Zanzibar, Tanzania (Gardiner & Waugh 1938); Red Sea (Gardiner & Waugh 1938); 101–366 m. Elsewhere: widely distributed in Atlantic and Indo-West Pacific; 44–635 m (Cairns 1989*b*).

Family **Flabellidae**
Genus *Flabellum*

Flabellum (Ulocyathus) japonicum bythios subsp. nov.

Fig. 10A–B

Flabellum japonicum Wood Mason & Alcock, 1891*a*: 449–450. Alcock, 1898: 23. Gardiner, 1929: 306–308, pl. 13 (figs 1–6) [*part.*—not station 242].
Flabellum apertum: Keller, 1974: 205–208 [*part.*—V–4620, pl. 6 (figs 6–7)].
Flabellum japonicum sensu Alcock, 1898: Cairns, 1989*b*: 54, 56.

Records

Holotype: V–2815, 1, IOM. Paratypes: V–2653, 1, IOM; V–2814, 1, IOM; V–2815, 1, IOM; *Marion Dufresne* 27–4, 9, USNM 77203, 1, SAM–H4575; *Investigator*–133, 2, USNM 18156.

Description

Corallum elliptical in cross-section (GCD : LCD about 1,3), having a full, campanulate shape, the 12 C_1 and C_2 only slightly ridged at point of upward inflection of corallum. Corallum fragile and thus often collected damaged. Slightly damaged holotype 46,7 × 36,0 mm in calicular diameter (estimated) and slightly over 25 mm in height. Pedicel circular, about 2,5 mm in diameter. Freshly preserved coralla light reddish-brown, sometimes more intensely pigmented near thecal edges of S_1 and S_2. Lower corallum—that part probably submerged in soft substrate—usually corroded to a white or light grey colour.

Septa hexamerally arranged in five complete cycles; however, one large specimen (V–2653) of 55 mm GCD has 14 primary septa and a corresponding number of higher cycle septa for a total of 112 septa. S_1 and S_2 equal in size, their straight inner edges almost meeting in centre of fossa. S_3 about half width of S_1 and S_2; S_4 about half width of S_3; S_5 rudimentary, extending only several millimetres down thecal wall and having irregular, dentate inner edges. Calicular margins scalloped, each S_1 and S_2 and adjacent S_5 forming a triangular thecal extension about 3,5 mm tall, and each S_3 a smaller extension of about 1,5 mm in height. Inner edges of all septa straight and the septa themselves are planar; septal faces relatively smooth, covered with low, inconspicuous granules. All septa quite thin (about 0,3 mm) and well separated from adjacent septa by a distance of 4–5 septal thicknesses.

Fossa deep and elongate. Columella an elongate, concave fusion of lower, inner edges of S_1–S_3.

Remarks

Cairns (1989*b*: 56) suggested that the Indian Ocean specimens previously reported as *F. japonicum* (see synonymy) be considered as a new species, and listed four differences between them and typical *F. japonicum*. To reiterate, the Indian Ocean specimens have a campanulate corallum, higher thecal extensions, white coralla, and lack thecal edge crests. These differences still appear valid except for corallum colour, well-preserved Indian Ocean specimens having the same pigmentation as *F. japonicum*. However, another difference noted here is that the pedicel of *F. japonicum bythios* subsp. nov. is circular and larger than that of the typical subspecies. Gardiner (1929) noted small differences between *F. japonicum* and Indian Ocean specimens, but did not consider them to be of specific importance. Given the geographic and bathymetric isolation of the two forms (see Distribution) and the several minor but consistent morphological differences, the Indian Ocean specimens are considered to represent a subspecies of *F. japonicum*.

Etymology

The subspecies name *bythios* (from the Greek *bythios*, of the deep) is an allusion to the apparent deeper range of this subspecies than the typical subspecies.

Distribution

Off south-western Madagascar; Mascarene Plateau; Laccadive Sea (Gardiner 1929; Keller 1974); Gulf of Manaar (Gardiner 1929); Bay of Bengal (Alcock 1898; Gardiner 1929); 1 095–1 720 m. Type locality: 9°40′S 60°31′E (Mascarene Plateau), 1 520–1 720 m. Distribution of typical subspecies: off Japan; Philippines; Indonesia; 128–1 141 m (Cairns 1989*b*).

Flabellum (Ulocyathus) lowekeyesi Squires & Ralph, 1965

Fig. 10D–E

Flabellum lowekeyesi Squires & Ralph, 1965: 259 (figs 1–2). Squires & Keyes, 1967: 27, pl. 6 (figs 1–2). Cairns, 1989*b*: 54.

New records

V–2637, 1, IOM; V–2668, 11, IOM, 1, USNM 91734; V–2706, 4, IOM; V–2721, 95, IOM; V–2764, 2, IOM; V–2816, 30, IOM.

Remarks

The south-west Indian Ocean specimens are indistinguishable from typical specimens from off New Zealand.

Distribution

Indian Ocean: off south-eastern Mozambique; Mascarene Plateau; Madagascar Plateau; 835–1 030 m. Elsewhere: Campbell Plateau and off New Zealand; 278–732 m (Squires & Keyes 1967).

Flabellum (Ulocyathus) messum Alcock, 1902*c*

Fig. 10G–H

Flabellum lacianiatum var. *messum* Alcock, 1902*c*: 31.
Flabellum (U.) messum: Cairns, 1989*b*: 58–59, pl. 30 (figs f–i, k) [synonymy].

New record

V–2816, 1, USNM 91735.

Remarks

Flabellum messum is very similar to *F. lowekeyesi*, but differs in having a reddish-brown corallum; a rough, granular thecal texture; better defined thecal extensions; and independent S_4 (see also Cairns 1989*b*: 58).

Distribution

Indian Ocean: Mascarene Plateau; 430–835 m. Elsewhere: off Philippines (Cairns 1989*b*); Indonesia (Alcock 1902*c*); 368–949 m.

Flabellum (Flabellum) pavoninum Lesson, 1831

Flabellum pavoninum Lesson, 1831: 2. Gardiner, 1902: 123–125, pl. 4 (figs 18–21); 1904: 98. Gardiner & Waugh, 1938: 174. Zibrowius *et al.*, 1975: 98–99, pl. 2 (figs D–E). ?Boshoff, 1981: 35. Zibrowius & Grygier, 1985: 122. Cairns, 1989*b*: 46–50, pl. 23 (figs g–l), pl. 24 (figs a–d) [synonymy].
Flabellum pavoninum sensu Gardiner, 1902. Cairns, 1989*b*: 47, pl. 24 (figs g–h).
Flabellum sp. 6 Cairns, 1989*a*: 63, 67, text-fig. 2.

New records

V–2662, 1, IOM; V–2686, 1, IOM; V–2724, 16, IOM; V–2767, 8, IOM; V–2804, 3, IOM; AB–371E, 2, USNM 91724; AB–372L, 10, USNM 91726; AB–390S, 24, USNM 91727; AB–421G, 1, USNM 91728; *Manihine* 381–63, 1, USNM 91722; MN–ZD4, 1, USNM 91738; MN–ZCC1, 2, USNM 91732; MN–ZU13, 6, USNM 91729; MN–ZU15, 11, USNM 91730, 1, SAM–H4582; MN–ZW6, 1, USNM 91731. Reference specimens: Gardiner & Waugh's (1938) specimens from: JM–104, 1, BM 1950.1.9.1; JM–106, 3, BM 1950.1.9.11–35; JM–123, 1, BM 1950.1.9.2–3; JM–157, 2, 1950.1.9.36–40.

Remarks

Although I (Cairns 1989*a*, 1989*b*) previously distinguished the western Indian Ocean specimens of *Flabellum* from *F. pavoninum*, based on discriminant analysis, additional specimens of typical *F. pavoninum* recently examined from off Japan convince us that these specimens are conspecific. Almost all characters analysed of *F. pavoninum* and *F. pavoninum* sensu Gardiner (1902) in the discriminant analysis (Cairns 1989*a*, table 5) were overlapping.

Distribution

Indian Ocean: off Durban (Gardiner 1902) to Zululand, South Africa; off Zanzibar and Pemba, Tanzania (Gardiner & Waugh 1938); off Kenya (Cairns 1989*b*); off western Madagascar (Zibrowius *et al.* 1975); Madagascar Plateau; Mascarene Plateau; Arabian Sea (Gardiner & Waugh 1938); Maldive Islands (Gardiner & Waugh 1938);

98–665 m. Elsewhere: off Japan; South China Sea; Hawaii; 223–271 m (Cairns 1989*b*).

Genus *Truncatoflabellum*

KEY TO THE SOUTH-WEST INDIAN OCEAN SPECIES OF *TRUNCATOFLABELLUM*

1A. Corallum small (GCD < 13 mm); septa few (some S_5 may be present, but never a full cycle) 2

1B. Corallum medium- to large-sized, robust (adult GCD usually over 15 mm); septa more numerous (usually > 80, often with S_6) 4

2A. Coralla with only three cycles of septa, often with some S_4 (i.e. 32 septa) ..... *T. pusillum* Cairns, 1989*b*

2B. Coralla with four cycles of septa, often with some S_5 (i.e. 56 septa) 3

3A. Thecal edges carinate (not spinose); anthocyathus and anthocaulus invariably separate ..... ***T. gardineri*** sp. nov.

3B. Thecal edges rounded (also usually non-spinose); anthocyathus and anthocaulus often remain attached ..... ***T. zuluense*** sp. nov.

4A. Thecal edges rounded, no thecal spines 5

4B. Thecal edges not rounded: either spinose or carinate 6

5A. Thecal edge angle large (about 68); anthocyathus basal scar small (3,5 × 2,5 mm) ..... *T. stabile* (von Marenzeller, 1904)

5B. Thecal edge angle less than 60; anthocyathus scar larger, 5,1–6,7 × 4,0–4,8 mm ..... *T. inconstans* von Marenzeller, 1904

6A. Thecal edges of anthocyathus spinose, with up to 7 pairs of spines ..... ***T. multispinosum*** sp. nov.

6B. Thecal edges of anthocyathus acute, often carinate, having no spines ..... *T. formosum* Cairns, 1989*b*

Truncatoflabellum sp. cf. *T. stabile* (von Marenzeller, 1904)

Fig. 10C, F

New record

V–2629, 1, IOM.

Diagnosis

A unique specimen measures 47,6 × 25,8 mm in calicular diameter and 61,3 mm tall. Angle of thecal edges a constant 68°; inclination of thecal faces 32°. Theca worn, although septa are freshly preserved. Thecal edges rounded; no thecal edge spines or crests present. Basal scar small, only 3,5 × 2,5 mm in diameter. Corallum dense and white, with an evenly arched upper calice. Septa hexamerally arranged according to the formula: S_1–S_3>S_4>S_5. Four pairs of S_6 occur in four random half-systems, for a total of 104 septa. Inner septal edges straight; septa concave near junction with calice. Fossa quite deep, containing a rudimentary columella composed of lower, inner edges of S_1–S_4.

Remarks

This specimen corresponds to the description and illustrations of *Truncatoflabellum stabile* (von Marenzeller, 1904: 273–274, pl. 17 (fig. 12)); however, no comparative specimens have been examined of this species, since the type apparently is missing (Zibrowius 1980). Although similar to the *Truncatoflabellum* reported by Zibrowius & Gili (1990) from Walvis Ridge in shape and in having a small basal scar, it differs in having five cycles of septa, not four. It is most similar to *T. inconstans*, especially in corallum size, number of septa, and in lacking thecal edge spines, but appears to differ in having a higher thecal edge angle (and thus a much more open calice) and a smaller anthocyathus basal scar (see Key).

Distribution

Off south-eastern Mozambique; 1 250–1 520 m. Distribution of *T. stabile*: Cape Verde, Selvagems, and Madeira islands; 1 450–3 010 m (Zibrowius & Gili 1990).

Truncatoflabellum formosum Cairns, 1989*b*

Fig. 10I, 11A

Truncatoflabellum formosum Cairns, 1989*b*: 69–70, pl. 35 (figs j–k), pl. 36 (figs a–b) [synonymy].

New records

V–2635, 2, IOM, 1, USNM 91757; MN–ZCC2, 1, USNM 91760.

Remarks

The Indian Ocean specimens were compared to the types of *T. formosum* and found to be indistinguishable. The illustrated specimen measures 20,0 × 13,6 mm in calicular diameter and 23,7 mm in height.

Distribution

Indian Ocean: off Zululand, South Africa; off south-eastern Mozambique; 150–230 m. Elsewhere: Korea Strait; Philippines; Celebes; 37–933 m (Cairns 1989*b*).

Truncatoflabellum pusillum Cairns, 1989*b*

Fig. 11E

Truncatoflabellum pusillum Cairns, 1989*b*: 71–72, pl. 37 (figs a–e).

New records

AB–371E, 1, USNM 91755; AB–371F, 35, USNM 91756, 1, SAM–H4587.

Remarks

The specimens from Mozambique agree in all respects with the type specimens of *T. pusillum* from the Philippines, the largest anthocyathus measuring 8,39 × 6,22 mm in calicular diameter and 12,2 mm in height.

Distribution

Indian Ocean: off south-eastern Mozambique; 110–132 m. Elsewhere: Philippines; 143–146 m (Cairns 1989*b*).

Truncatoflabellum gardineri sp. nov.

Fig. 11B–D

Records

Holotype: AB–390S, 1, USNM 91736. Paratypes: AB–390S, 132, USNM 91737, 3, SAM–H4577.

Description

Lower half of anthocyathi compressed, their lateral edges carinate in a series of low, thin, discontinuous ridges projecting outward up to 1,3 mm; upper half of anthocyathi less compressed (GCD : LCD = 1,30–1,47), their edges evenly rounded and essentially parallel. Inclination of convex thecal faces 14–18°. Coralla small and elongate: holotype (an anthocyathus) 10,9 × 8,3 mm in calicular diameter and 17,4 mm in height, with a basal scar diameter of 5,5 × 3,2 mm. Largest anthocyathus 12,7 mm in GCD and 18,7 mm in height. Basal anthocyathus scar elliptical: 4,1–5,3 × 2,8–3,3 mm in diameter. Corallum white. Anthocauli also have carinate edges, a pedicel diameter of 2,1–2,5 mm, four cycles of septa, and rarely exceed 10 mm in height.

Septa hexamerally arranged in four complete cycles (S_1–$S_2 > S_3 > S_4$), only the largest specimens having four pairs of rudimentary S_5 in the end quarter-systems (56 total septa). Inner edges of S_1 and S_2 vertical and highly sinuous, their lower, inner edges fusing deep in fossa to form a rudimentary columella. S_3 half to three-quarters width of S_1 and S_2 and less sinuous; S_4 much smaller than S_3, with dentate to laciniate inner edges. All septal faces covered with prominent granules. Fossa deep and elongate.

Remarks

T. P. Lowe observed living specimens of this species shortly after capture and observed that each anthocyathus had two tentacular rings, the outer composed of small, white tentacles, the inner composed of larger tentacles with white tips and blood-red bases. Furthermore, he noted six orange stripes on the calice extending from the calicular edge to the outer tentacular ring.

Of the 28 species of *Truncatoflabellum* listed by Cairns (1989*a*), almost all have one or more pairs of thecal edge spines on their anthocyathi. In the few non-spinose species, the lateral edges are either rounded or sharp-edged. *Truncatoflabellum gardineri* sp. nov. is therefore unique in having non-spinose, carinate thecal edges. It is further distinguished by its relatively small size, parallel thecal edges, and low number of septa. It is similar to *T. pusillum* in corallum and scar size, but can be distinguished by its greater number of septa (48 vs 32) and in having non-spinose, parallel thecal edges.

Etymology

Named in honour of John Stanley Gardiner, who published significant papers on the deep-water corals of the south-west Indian Ocean (see Introduction and Table 1).

Distribution

Known only from the type locality: 29°34′S 31°42′E (off Durban, South Africa), 138 m.

Truncatoflabellum zuluense sp. nov.

Fig. 11F–G

Records

Holotype: MN–ZK21, 1, USNM 91747. Paratypes: MN–ZC9, 2, USNM 91748, 1, SAM–H4581; MN–ZC10, 2, USNM 91749; MN–ZC11, 1, USNM 91750; MN–ZDD2, 1, USNM 91753; MN–ZDD3, 1, USNM 91754; MN–ZK20, 2, USNM 91751; MN–ZK21, 2, USNM 91752.

Description

In all 13 specimens examined, the anthocyathi and anthocauli remained together as one corallum, but a difference in corallum colour and an incipient fracture line usually indicated where the separation would occur. Corallum compressed (GCD : LCD = 1,4–*1,65*–1,8), with rounded thecal edges diverging at a constant angle of 28–38°. Inclination of thecal faces 18–22°. Coralla small: holotype 13,2 × 7,9 mm in calicular diameter and 17,2 mm in height, with a pedicel diameter of 1,9 mm. Lower 6 mm of corallum (presumed anthocaulus) white and usually non-spinose but sometimes bearing one pair of short thecal edge spines. At corallum height of about 6 mm and a calicular diameter of about 6,0–6,5 × 4,5 mm, the corallum bears a transverse crease, which is presumed to be the incipient fracture line, above which the corallum (anthocyathus) is reddish-brown. Anthocyathi also usually non-spinose but occasionally bear one pair of short thecal edge spines basally.

Septa hexamerally arranged in four cycles (S_1–S_2>S_3>>S_4), larger specimens also having pairs of S_5 in the end half-systems (total of 56 septa). Inner edges of S_1 and S_2 vertical and sinuous, defining a deep and narrow fossa. S_3 about two-thirds width of larger septa; S_4 much smaller, usually with finely dentate inner edges. All septa covered with tall granules.

Remarks

Truncatoflabellum zuluense sp. nov. is distinguished from most other species in the genus by its small size and by having only 48–56 septa; rarely having thecal spines; and in maintaining the anthocaulus–anthocyathus connection long into ontogeny. *Truncatoflabellum zuluense* is most similar to *T. gardineri* sp. nov., another relatively shallow-water, south-west Indian Ocean species, especially in corallum size and septal number, but can be distinguished by its rounded, sometimes spinose, divergent thecal edges (not carinate and parallel); retention of the anthocaulus stage; and reddish-brown corallum colour.

Etymology

The species name *zuluense* is an allusion to the area of capture of the type series: off Zululand, South Africa.

Distribution

Known only from off Zululand, South Africa; 62–84 m. Type locality: 27°47,6′S 32°39,1′E, 62–84 m.

Truncatoflabellum multispinosum sp. nov.

Figs 11H, 12A–C

Records

Holotype: V–2634, 1, USNM 91739. Paratypes: AB–372L, 55, USNM 91741, 1, SAM–H4580; AB–409E, 2, USNM 91742; MN–ZB11, 1, USNM 91743; MN–ZB17, 1, USNM 91744; MN–ZDD4, 1, USNM 91746; MN–ZH18, 2, USNM 91745; CH11–329–10, 2, USNM 91740.

Description

Angle of acute thecal edges 41–56°; inclination of convex thecal faces 19–32°. Largest anthocyathus (holotype) 32,2 × 15,7 mm in calicular diameter and 28,1 mm in height, with a basal scar diameter of 7,3 × 4,8 mm. Up to seven pairs of slender spines project from thecal edges, usually regularly occurring from scar to calice, the number determined by size of corallum. Basal scar of anthocyathus elliptical: 5,6–7,3 × 4,2–4,8 mm in diameter. Calice elliptical, GCD : LCD = 1,67–*1,83*–2,05. Theca of anthocyathus reddish-brown, often more intensely striped vertically; septa of anthocyathus and entire anthocaulus white. Anthocauli rarely greater than 7,5 mm in height, having the calicular diameter of the anthocyathus basal scar. Anthocauli have a pedicel diameter of 1,8–2,0 mm, 24 septa, and one pair of thecal edge spines.

Septa of large coralla (e.g. over 23 mm GCD) hexamerally arranged in five cycles according to the formula: S_1–S_3>S_4>S_5, often with four pairs of S_6 in the four quarter-systems adjacent to the two principal S_1; however, the large holotype lacks two pairs of S_5 in lateral half-systems, resulting in 100 septa. In medium-sized anthocyathi (e.g. GCD = 10–22 mm), symmetry appears to be decameral, coralla often having the formula: 20 : 20 : 40 (80 septa), with irregular development of tertiary septa in lateral half-systems and accelerated development in the end half-systems. S_1–S_3 have finely sinuous, vertical inner edges, which define a narrow, elongate fossa. S_4 only slightly smaller, their inner edges sometimes also reaching the columella. S_5 about one-third width of S_4; S_6 rudimentary. Columella a trabecular fusion of lower, inner edges of S_1–S_3 and occasionally the S_4.

Remarks

Among the 30 described species of *Truncatoflabellum* (see Cairns 1989*b*), *T. multispinosum* sp. nov. most closely resembles *T. candeanum* (Milne Edwards & Haime, 1848), particularly in thecal colour, number of septa, and in having relatively widely divergent thecal edges. *Truncatoflabellum multispinosum* sp. nov. differs consistently, however, in having a smooth calicular edge (that of *T. candeanum* is scalloped); larger S_4 in relation to the S_1–S_3; a larger anthocyathus scar; and slightly less divergent thecal edges and faces. *Truncatoflabellum vanuatu* (Wells, 1984) is the only species known to have up to five pairs of thecal spines, but differs in having a much smaller anthocyathus

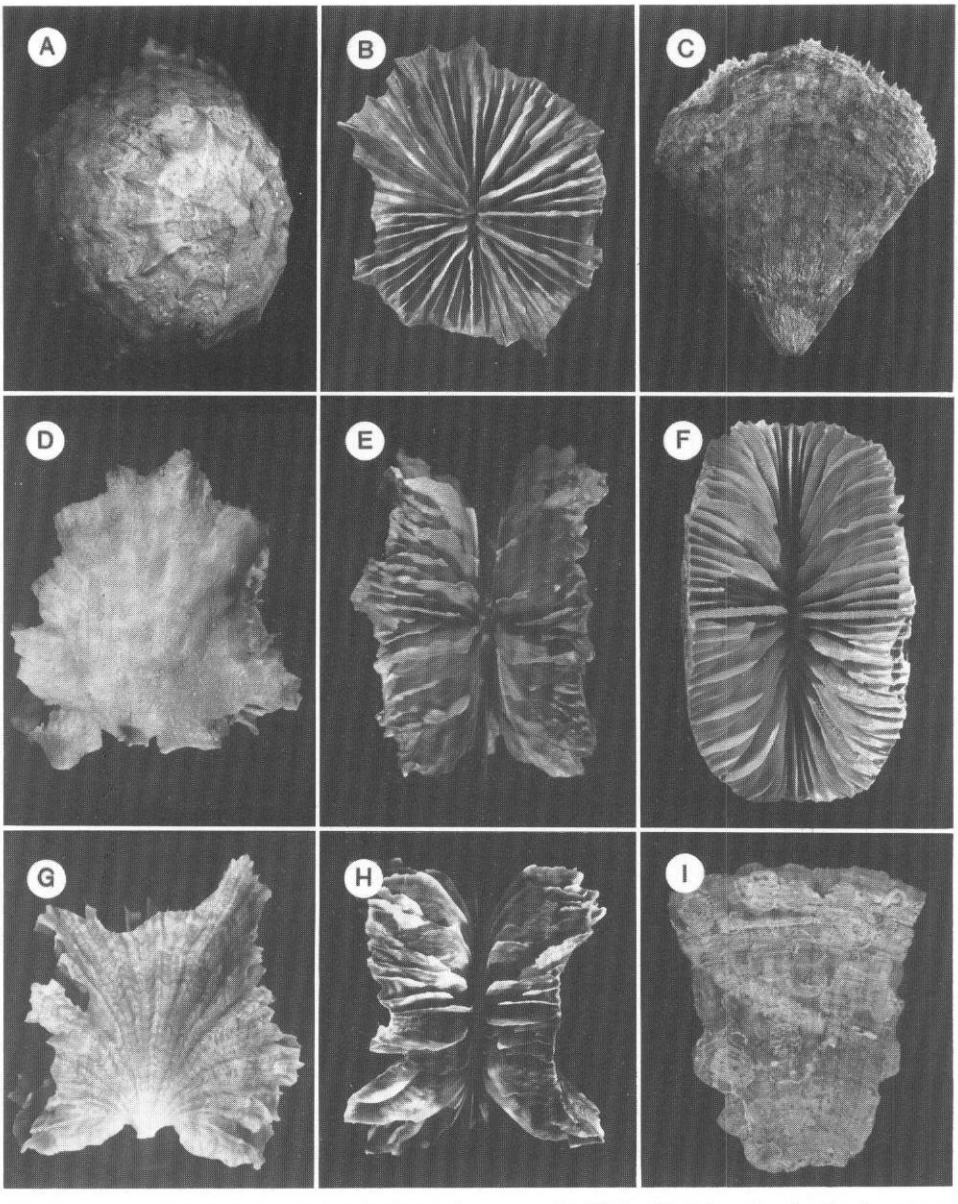

Fig. 10. A–B. *Flabellum japonicum bythios* subsp. nov., V–2815, IOM, basal and calicular views. Both × 1,0. C, F. *Truncatoflabellum* sp. cf. *T. stabile*, V–2629, IOM, lateral and calicular views. C × 0,8, F × 1,1. D–E. *Flabellum lowekeyesi*, V–2668, USNM 91734, lateral and calicular views. D × 1,2, E × 1,7. G–H. *Flabellum messum*, V–2816, USNM 91735, lateral and calicular views. G × 1,0, H × 1,3. I. *Truncatoflabellum formosum*, V–2635, USNM 91757, lateral view. × 1,8.

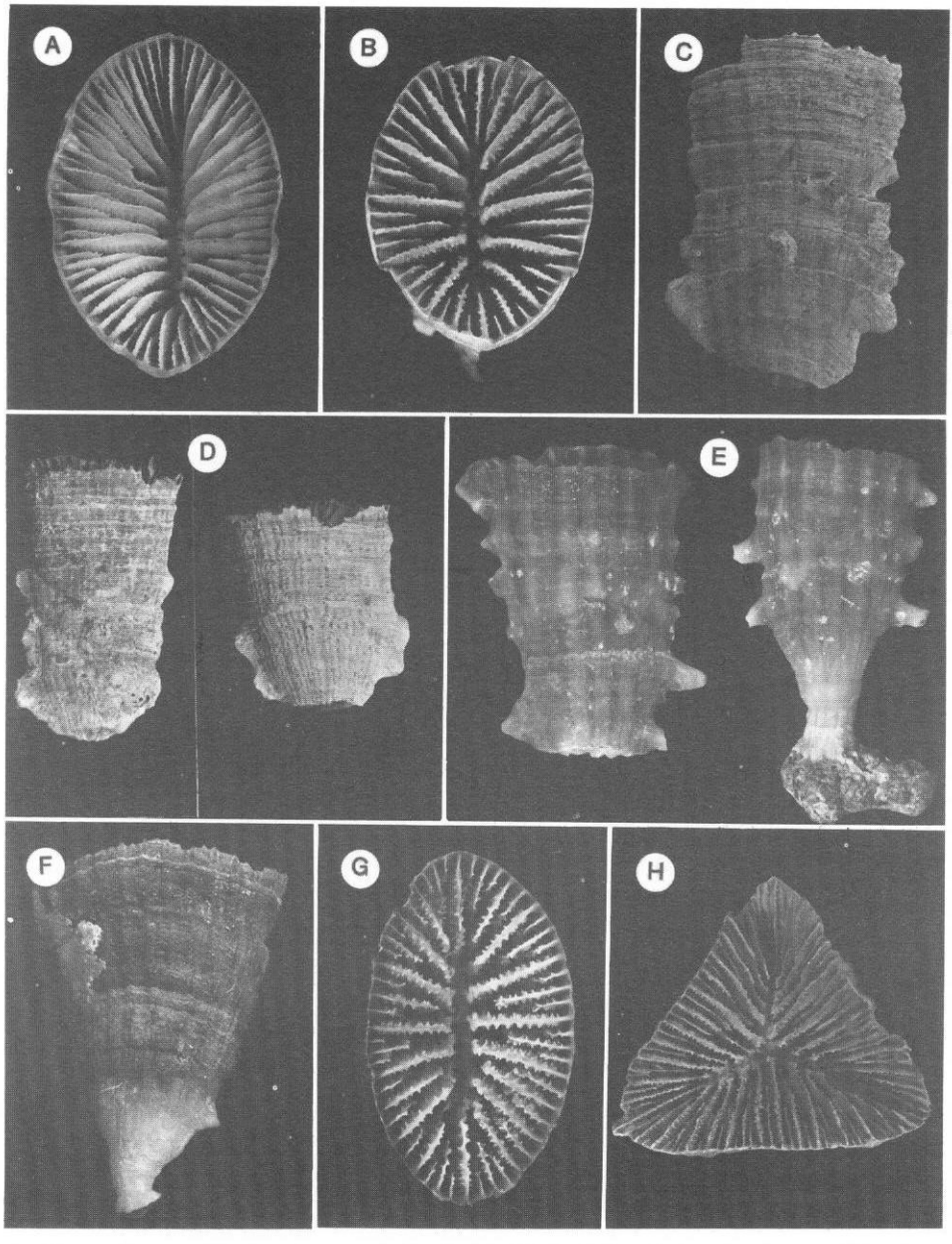

Fig. 11. A. *Truncatoflabellum formosum*, V–2635, USNM 91757, calicular view. × 2,4. B–D. *Truncatoflabellum gardineri* sp. nov. from AB–390S. B–C. Calicular and lateral views of holotype. B × 3,9, C × 2,9. D. Lateral view of two paratypes. × 2,2. E. *Truncatoflabellum pusillum*, AB–371F, USNM 91756, lateral view of anthocyathus and anthocaulus. × 5,2. F–G. *Truncatoflabellum zuluense* sp. nov., MN–ZK21 (holotype), lateral and calicular views. F × 2,9, G × 3,8. H. *Truncatoflabellum multispinosum* sp. nov., aberrant paratype from AB–372L. × 2,2.

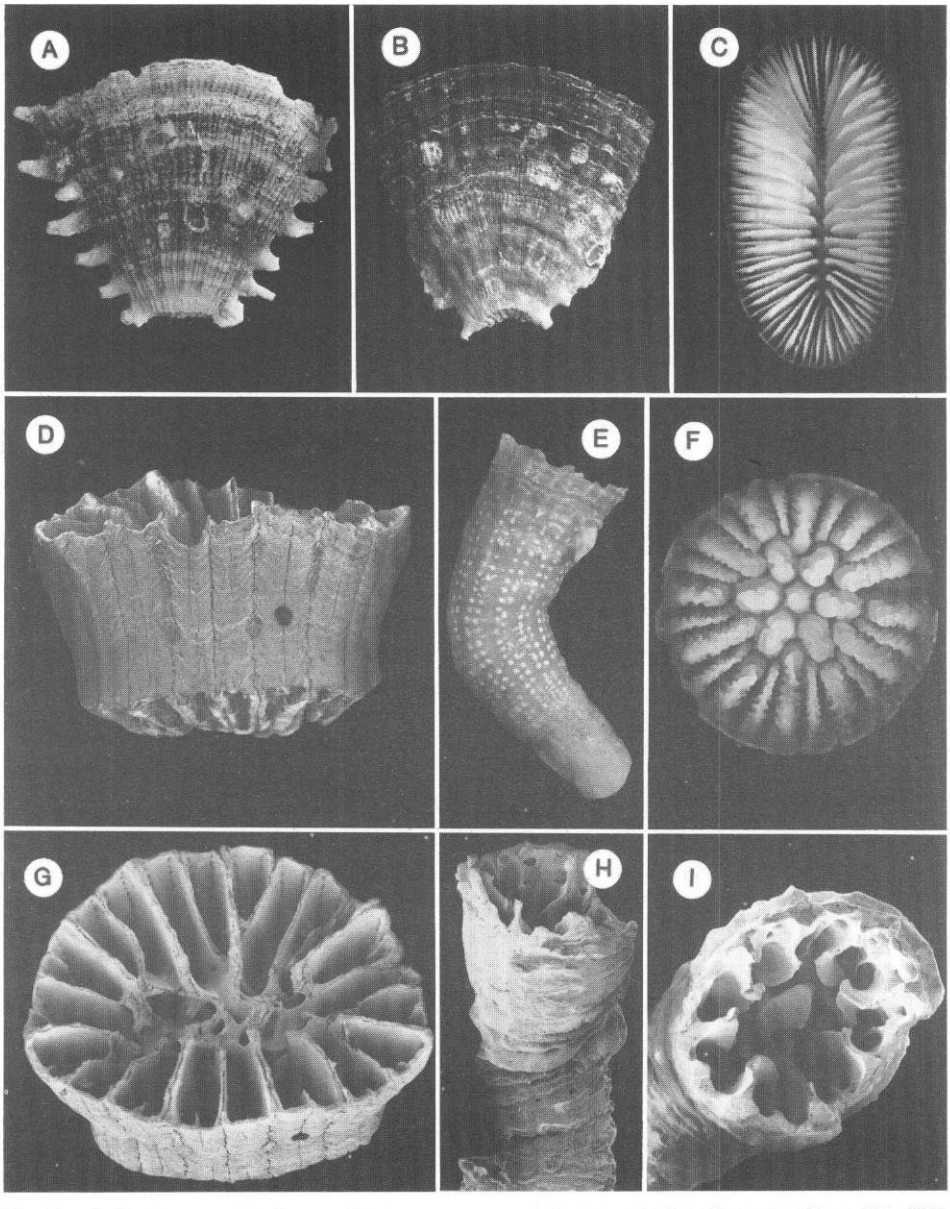

Fig. 12. A–C. *Truncatoflabellum multispinosum* sp. nov. A. Lateral view of paratype from AB–372L (USNM 91741) showing seven pairs of lateral spines. × 1,7. B–C. V–2634, lateral and calicular views of holotype. B × 1,2, C × 1,5. D, G. *Placotrochides scaphula*, AB–389C, USNM 91772, lateral and calicular views. D × 8,1, G × 8,4. E–F. *Stenocyathus vermiformis*, V–2722, USNM 91775, lateral and calicular views. E × 3,7, F × 7,4. H–I. *Guynia annulata*, AB–390S, USNM 77201, lateral and calicular views. H × 17, I × 23.

scar; having a much narrower anthocyathus (edge angle only 20–27°); and in having fewer septa.

Etymology

The species name *multispinosum* (from the Latin *multus*, more + *spina*, spine) is an allusion to the numerous thecal edge spines characteristic of this species.

Distribution

Off Zululand, South Africa; off south-eastern Mozambique; Mozambique Channel off western Madagascar; off Zanzibar, Tanzania; 62–183 m. Type locality: 25°05′S 34°50′E (south-eastern Mozambique), 90–92 m.

Genus *Javania*

Javania insignis Duncan, 1876

Javania insignis Duncan, 1876: 435, pl. 39 (figs 11–13). Von Marenzeller, 1907*b*: 23, pl. 2 (fig. 6). Zibrowius, 1974*b*: 8–9, pl. 1 (figs 1–6). Fricke & Schuhmacher, 1983: 184. Scheer & Pillai, 1983: 165–166, text-fig. 4, pl. 37 (figs 9–12). Cairns, 1989*b*: 77–78, pl. 40 (figs d–e, h, j, k) [synonymy].
Flabellum weberi Alcock, 1902*a*: 107. Cairns, 1989*b*: 77. [syn. nov.]

New records

AB–371F, 1, SAM–H4591; MN–ZC11, 1, USNM 91768; MN–ZDD3, 2, USNM 91770; MN–ZQ8a, 1, USNM 91769. Reference specimen: holotype of *Flabellum weberi*, *Siboga*–310, ZMA 1232.

Distribution

Indian Ocean: off Natal and Zululand, South Africa; off south-eastern Mozambique (Cairns, 1989*b*); off north-western Madagascar (Zibrowius 1974*b*); Red Sea (Von Marenzeller 1907*b*; Fricke & Schuhmacher 1983; Scheer & Pillai 1983); 74–255 m. Elsewhere: off Japan; Philippines; Indonesia; Hawaiian Islands; 46–825 m (Cairns 1989*b*).

Genus *Placotrochides*

Placotrochides scaphula Alcock, 1902*b*

Fig. 12D, G

Placotrochides scaphula Alcock, 1902*b*: 121–122; 1902*c*: 34, pl. 4 (fig. 32, 32a). Cairns, 1989*b*: 78–79, pl. 40 (fig. l), pl. 41 (figs a–e) [synonymy].

New records

AB–365D, 1, USNM 91771; AB–389C, 4, USNM 91772; AB–389E, 1, USNM 91773.

Remarks

The south-west Indian Ocean specimens are similar to the holotype of *P. scaphula* from Indonesia, more so than those specimens reported by Cairns (1989*b*) from

the Philippines, which are considerably larger and have more septa. The figured specimen measures 6,43 × 4,97 mm in calicular diameter and has 18 major septa.

Distribution

Indian Ocean: off Natal, South Africa; off south-western Madagascar; 475–1 360 m. Elsewhere: Philippines; Indonesia; 462–1 628 m (Cairns 1989*b*).

Family **Guyniidae**
Genus *Guynia*

Guynia annulata Duncan, 1872

Fig. 12H–I

Guynia annulata Duncan, 1872: 32, pl. 1 (figs 1–8). Cairns, 1984: 23, pl. 5 (figs A–B); 1989*b*: 42, pl. 21 (fig. f), pl. 22 (figs a–e) [synonymy]. Cairns & Parker, 1992: 42–43, pl. 14 (figs g–h).
Pyrophyllia inflata Hickson, 1910: 1–7, text-figs 1–4; 1911: 1 038–1 042. Harrison, 1911: 1 020, pl. 57 (figs 8–11), pl. 58 (figs 18–19).

New records

AB–372L, 3, USNM 77202; AB–390S, 2, USNM 77201.

Distribution

Indian Ocean: off Durban, South Africa; off south-eastern Mozambique; Gulf of Oman (Hickson 1910, 1911; Harrison 1911); 112–286 m. Elsewhere: probably cosmopolitan—amphi-Atlantic; Indonesia; Philippines; New Caledonia; Hawaiian Islands; southern Australia; 28–653 m (Cairns & Parker 1992).

Genus *Stenocyathus*

Stenocyathus vermiformis (Pourtalès, 1868)

Fig. 12E–F

Coenocyathus vermiformis Pourtalès, 1868: 133.
Stenocyathus vermiformis: von Marenzeller, 1904: 298–300, pl. 18 (fig. 16). Zibrowius, 1974*a*: 769–770. Cairns, 1979: 168–170, pl. 32 (figs 8–10), pl. 33 (figs 1–2) [synonymy]; 1982: 52, pl. 16 (figs 8–11); 1984: 23–25, pl. 5 (fig. c). Cairns & Parker, 1992: 43–44, pl. 14 (figs b–c).

New records

V–2722, 1, USNM 91775; V–2723, 1, IOM.

Distribution

Indian Ocean: Madagascar Plateau near Walters Shoal; St Paul and Amsterdam Islands (Von Marenzeller 1904; Zibrowius 1974*a*); 80–672 m. Elsewhere: amphi-Atlantic, off New Zealand; Tasmania; Great Barrier Reef; 80–1 229 m (Cairns & Parker 1992).

Suborder DENDROPHYLLIINA
Family **Dendrophylliidae**
Genus *Balanophyllia*

Balanophyllia stimpsonii (Verrill, 1865)

Eupsammia stimpsonii Verrill, 1865: 150.
Rhodopsammia socialis: Alcock, 1893: 147.
Balanophyllia socialis: Bourne, 1905: 210, pl. 2 (fig. 8, 8a). Harrison & Poole, 1909: 902.
Balanophyllia imperialis: van der Horst, 1926: 48.
Balanophyllia affinis: van der Horst, 1931: 10. Gardiner & Waugh, 1939: 240.
Balanophyllia cumingii: Gardiner & Waugh, 1939: 238, pl. 1 (fig. 1).
Balanophyllia stimpsonii: Zibrowius, 1985: 234–235 [synonymy]. Zibrowius & Grygier, 1985: 126–127, figs 27–29.

New records

V–2634, 1, IOM; AB–372L, 2, USNM 77228.

Distribution

A common, free-living, shallow-water Indo-West Pacific species. Indian Ocean: False Bay and off Natal, South Africa (Zibrowius 1985); off Mozambique; off Somalia (Zibrowius & Grygier 1985); Seychelles and Reunion (Zibrowius 1985); Gulf of Oman (Zibrowius & Grygier 1985); off Sri Lanka (Van der Horst 1926; Gardiner & Waugh 1939); Gulf of Manaar (Bourne 1905); Maldive Islands (Gardiner & Waugh 1939); Andaman Sea (Alcock 1893); Mergui Archipelago (Harrison & Poole 1909); 11–112 m. Elsewhere: Philippines; Indonesia; Chesterfield Islands; eastern Australia (Zibrowius 1985).

Balanophyllia ponderosa van der Horst, 1926

?*Eupsammia regalis* Alcock, 1893: 144–145, pl. 5 (fig. 8, 8a).
Balanophyllia ponderosa van der Horst, 1926: 49–50, pl. 3 (figs 6–7). Eguchi, 1968: C54 [*part.*— pl. C17 (figs 6–11, 13–14)]. ?Boshoff, 1981: 41.

New record

MN–ZA48, 1, USNM 91777. Reference specimen: holotype of *B. ponderosa* (BM 1939.7.20.62).

Remarks

This specimen, measuring 20,4 × 15,8 mm in calicular diameter and 26,7 mm in height, is identical to the holotype of *B. ponderosa* van der Horst (1926), except that the specimen lacks epitheca and is unattached, perhaps both the result of damage early in ontogeny. In this regard, however, it is very similar to the original illustration of *B. regalis* (Alcock, 1893), which may prove to be the senior synonym if the type of *B. regalis* can be obtained.

Distribution

Indian Ocean: ?off Durban (Boshoff 1981); off Zululand, South Africa; Seychelles (Van der Horst 1926); Maldive Islands (Van der Horst 1926); ?off Sri Lanka (Alcock 1893); 51–59 m. Elsewhere: off Japan; 10–250 m (Eguchi 1968).

Balanophyllia diffusa Harrison & Poole, 1909

Fig. 13A, D

Balanophyllia diffusa Harrison & Poole, 1909: 906, pl. 85 (fig. 4a, b). Gardiner & Waugh, 1939: 239–240. ?Pillai & Scheer, 1976: 16.
Non *Balanophyllia diffusa* Harrison & Poole. Scheer & Pillai, 1983: 168.

New records

AB–372L, 2, USNM 91781; AB–390S, 1, USNM 91782; EAMFRO–C13, 2, USNM 78637; Cr. 329, Sta. 15, 2, USNM 78594 and 78639; MN–ZC10, 1, USNM 91780. Reference specimens: *B. diffusa* of Gardiner & Waugh (1939): JM–112, 4, BM 1939.7.13.67; JM–157, 10, BM 1950.1.6.35.

Remarks

Eight specimens appear to be conspecific with *B. diffusa*, based on the original description and figures of this species. The quasi-colonial nature of the *B. diffusa* reported by Gardiner & Waugh (1939) from Tanzania, Red Sea, and Maldive Islands, is simply due to specimens settling close to one another.

Distribution

Off Durban and Zululand, South Africa; off south-eastern Mozambique; off Pemba (Gardiner & Waugh 1939) and Zanzibar, Tanzania; north Kenya Banks; Mergui Archipelago (Harrison & Poole 1909); Maldive Islands (Gardiner & Waugh 1939; Pillai & Scheer 1976); 6–274 m.

Genus *Trochopsammia*

Trochopsammia togata (van der Horst, 1927) comb. nov.

Balanophyllia togata van der Horst, 1927: 5–6, pl. 2 (figs 10–11), text-fig. 3.
Thecopsammia togata: Wells, 1935: 531.

New records

AB–358A, 1, USNM 77237; MN–SM226, 1, USNM 91792, 1, SAM–H4592; MN–SM232, 4, USNM 91791.

Remarks

Trochopsammia togata cannot be placed in the genus *Balanophyllia*, because its septa are not arranged in a Pourtalès Plan. For the same reason, it cannot be placed in *Thecopsammia*, even though Vaughan & Wells (1943) and Wells (1956) incorrectly assumed that *Thecopsammia socialis* (type species of that genus) has normally arranged septa (see Cairns 1979). *Trochopsammia togata* is more similar to *Trochopsammia*, which is known from only the type species, *T. infundibulum* Pourtalès, 1878, differing primarily in not having well-defined costae. *Trochopsammia togata* can be diagnosed as having a slender, epithecate elongate corallum; fewer than four cycles of normally arranged septa, the four lateral S_1 being wider than the other two; and lacking a columella.

Distribution

Agulhas Bank (Wells 1935) to Durban, South Africa (Van der Horst 1927); 155–775 m.

Genus *Endopachys*

Endopachys grayi Milne Edwards & Haime, 1848*b*

Endopachys grayi Milne Edwards & Haime, 1848*b*: 82–83, pl. 1 (fig. 2). Van der Horst, 1926: 51; 1927: 6–7, pl. 2 (fig. 12). Gardiner & Waugh, 1939: 241. Boshoff, 1981: 42 [*part.*]. Cairns, 1984: 27, pl. 5 (fig. E) [synonymy]. Zibrowius & Grygier, 1985: 128, figs 39–42. Cairns, 1989*b*: 34.
Endopachys weberi Alcock, 1902*a*: 109–110 [syn. nov.].

New records

V–2634, 12, IOM; V–2809, 6, IOM, 1, USNM 91811; AB–371F, 1, USNM 77247; AB–372J, 3, USNM 77251; AB–372L, 82, USNM 77245; AB–390S, 15, USNM 77248, 2, SAM–H4593, 2, NM; AB–391H, 1, USNM 77252; AB–391J, 3, USNM 77246; *Vema* 14–SAT6, 5, USNM 77254; MN–ZDD2, 1, USNM 91813; MN–ZW8, 3, USNM 91812.

Remarks

The specimen from V–2809, measuring 38,9 × 32,7 mm in calicular diameter and 34,0 mm in height, is believed to be the largest recorded, yet only slightly larger than the holotype. It nonetheless has only five cycles of septa (96).

Distribution

Indian Ocean: off South Africa from off Bisho (Van der Horst 1927) to Zululand (Van der Horst 1927; Zibrowius & Grygier 1985); off south-eastern Mozambique; off Zanzibar, Tanzania (Cairns 1989*b*); off Mauritius (Van der Horst 1926) and Saya de Malha; north-eastern Arabian Sea (Gardiner & Waugh 1939); 57–274 m. Elsewhere: Western Pacific; Hawaiian Islands; Gulf of California; 37–274 m (Cairns 1984).

Genus *Rhizopsammia*

Rhizopsammia annae (van der Horst, 1933)

Fig. 13C

Balanophyllia annae van der Horst, 1933: 156–158, pl. 7 (figs 14); 1938, pl. 5 (fig. 1). Boshoff, 1981: 40.
Rhizopsammia annae: Zibrowius & Gili, 1990: 44.

New record

AB–391J, 1 colony, USNM 91790.

Distribution

Known only from off South Africa from the Cape of Good Hope (Van der Horst 1933) to Port Shepstone (Boshoff 1981); 0–80 m.

Rhizopsammia compacta Sheppard & Sheppard, 1991

Fig. 13B, E

Rhizopsammia compacta Sheppard & Sheppard, 1991: 153, fig. 179.

New records

AB–357B, 2, USNM 91794; AB–371F, 6, USNM 91795; MN–ZA43, 1, USNM 91796; MN–ZA48, 3, USNM 91797, 1, SAM–H4578; MN–ZA49, colony of 9 corallites, USNM 91793; MN–ZB11, 1, USNM 91798; MN–ZB14, 1, USNM 91799; MN–ZB17, 1, USNM 91800; MN–ZB18, 1, USNM 91801; MN–ZB20, 2, USNM 91802; MN–ZB23, 1, USNM 91803; MN–ZB25, 1, USNM 91804; MN–ZD5, 1, USNM 91805; MN–ZD7, 4, USNM 91806; MN–ZD10, 2, USNM 91807; MN–ZDD2, 2, USNM 91808; MN–ZDD3, 3, USNM 91809, 2, SAM–H4579; MN–ZDD5, 1, USNM 91810.

Redescription

Colonies irregularly shaped, composed of clumps of corallites interconnected by narrow stolons or consisting of small corallites budded from lower edge zone of larger corallites. Individual corallites broken from the substrate are indistinguishable from *Balanophyllia*. Corallites cylindrical to ceratoid in shape, the calice usually circular in young corallites but often becoming highly compressed in larger corallites, with a GCD : LCD up to 3,0. Largest colony examined (MN–ZA49) composed of 9 corallites, the largest 21,1 × 7,3 mm in calicular diameter and 27,2 mm in height, with slightly concave thecal faces. Costae equal in width, covered with fine spines; no epitheca. Corallum white, but often encrusted basally with red foraminifera.

Septa hexamerally arranged in five cycles (96 septa), only the largest corallites having pairs of S_6, e.g. the large corallite from MN–ZA49 has 8 pairs of S_6 in three of its half-systems for a total of 112 septa. S_1–S_3 equal in size, only slightly exsert, and have vertical inner edges descending into a deep fossa. S_4–S_6 slightly less exsert than S_1–S_3, the S_4 being the narrowest of the septa, flanked by pairs of S_5, which are slightly less wide than S_1–S_3 in the upper fossa, but equal in width to S_1–S_3 in lower fossa, where each pair of S_5 joins before its enclosed S_4. Septa closely spaced, giving a crowded aspect; septal faces covered by tall, robust granules. All inner septal edges straight: entire in upper fossa, finely dentate in lower fossa. Paliform lobes absent.

Fossa contains an elongate, spongy, flat columella that fuses to lower, inner edges of S_1–S_3, and S_5.

Remarks

This recently described species is redescribed herein, the original account being based on only one specimen. The equally wide, vertically-edged S_1–S_3 and S_5 of *R. compacta* produce a well-delineated fossa, which is characteristic of the species and helps to distinguish it from all others. Furthermore, it differs from the 11 other valid species in the genus (see Wells (1982) for listing of 8 species; plus *R. annae* (van der Horst, 1933); *R. wettsteini* Scheer & Pillai, 1983; and *R. eguchi* (Wells, 1982)) by having relatively large corallites with compressed calices; five full cycles of septa; S_1–S_3 equal in size; and no pali. It is perhaps most similar to *R. manuelensis* Chevalier, 1966, particularly in corallum shape and corallite size, but *R. manuelensis* differs

in having paliform lobes; exsert septa; one less cycle of septa; and a discrete columella. *Rhizopsammia compacta* differs from *R. wettsteini*, known from the Red Sea, in having larger, compressed corallites and in having equally-sized S_1–S_3.

Distribution

Known only from the Indian Ocean off Durban to south-eastern Mozambique (43–110 m) and the Gulf of Oman (35 m). Type locality: off Musandam, Gulf of Oman, 35 m.

Genus *Dendrophyllia*

Dendrophyllia sp. cf. *D. horsti* Gardiner & Waugh, 1939

Fig. 13F, I

?*Dendrophyllia arbuscula* van der Horst, 1922: 53, pl. 8 (fig. 6).
?*Dendrophyllia horsti* Gardiner & Waugh, 1939: 237–238, pl. 2 (figs 5–6). Pillai & Scheer, 1976: 16. Fricke & Schuhmacher, 1983: 184, fig. 14d. Scheer & Pillai, 1983: 171–172, pl. 39 (figs 11–12).
Dendrophyllia coccinea: van der Horst, 1926: 45–46, pl. 3 (figs 1–3). Gardiner & Waugh, 1939: 236.

New records

AB–372G, 1 colony, USNM 91814; MN–XX153, 1 colony, USNM 91815; MN–ZB11, 3 colonies, USNM 91816; MN–ZB18, 1 colony, USNM 91817; MN–ZB20, 2 colonies, USNM 91818; MN–ZC11, 1 colony, USNM 91819; MN–ZD6, 1 colony, USNM 91820. Reference specimens of Gardiner & Waugh's (1939) *D. coccinea*: JM–112, 1 colony, BM 1939.7.13.83.

Remarks

The south-west Indian Ocean specimens may be characterized as small irregular colonies, usually less than 5 cm in height, composed of 2–5 thick (about 12 mm in diameter), cylindrical corallites budded at angles of 45–80° from the parent corallite. Septa arranged in four cycles ($S_1>S_2>S_4>S_3$), with occasional S_5; fossa deep; columella discrete, convex. Because the types of *D. horsti* were not examined, the identification of these specimens must remain tentative. *Dendrophyllia arbuscula* may well be a larger colony of the same species.

Distribution

Off South Africa from Natal to Zululand; off Pemba, Tanzania (Gardiner & Waugh 1939); 50–113 m. Distribution of *D. horsti*: Red Sea (Fricke & Schuhmacher 1983; Scheer & Pillai 1983); Maldive Islands (Gardiner & Waugh 1939; Pillai & Scheer 1976); ?Indonesia (Van der Horst 1922); 45–229 m.

Dendrophyllia dilatata van der Horst, 1927

Dendrophyllia dilatata van der Horst, 1927: 2–3, pl. 1 (figs 2–4), text-fig. 1. Zibrowius & Gili, 1990: 44.

New records

AB–371E, 4 colonies, USNM 71865; AB–371F, 8 colonies, USNM 71866, 1 colony, SAM–H4571.

Remarks

Dendrophyllia dilatata is similar to the previous species in corallum size, septal arrangement, and geographic distribution, but can be distinguished by having a slightly larger (up to 7 cm), usually arborescent colony composed of up to a dozen sympodially arranged corallites; only four cycles of septa; smaller, ceratoid corallites; and a shallower fossa.

Distribution

Off Durban, South Africa (Van der Horst 1927) to off south-eastern Mozambique; 97–132 m.

Dendrophyllia cladonia van der Horst, 1927

Dendrophyllia cladonia van der Horst, 1927: 3–4, pl. 1 (figs 5–6), pl. 2 (fig. 7), text-fig. 2. Zibrowius & Gili, 1990: 44.

New records

AB–357B, 2 corallites, USNM 91826; AB–357E, 7 corallites, USNM 91825; AB–371F, 3 corallites, USNM 91824; AB–390S, 48 colonies or isolated corallites, USNM 91823.

Remarks

Dendrophyllia cladonia is very similar to *Dendrophyllia* sp. cf. *D. horsti* diagnosed above, especially in colony shape, size, and budding, number of septa, and in having cylindrical corallites. *Dendrophyllia cladonia* differs in having smaller corallites (about 8 mm in GCD), endothecal dissepiments, and in having a highly developed Pourtalès Plan, in which the two S_4 in every system that are adjacent to the S_1 are quite large and unite before the S_2, merging with the columella as one lamella. The S_1 of this species do not quite reach the columella. In *Dendrophyllia* sp. cf. *D. horsti*, S_4 do not join one another and the S_1 are the widest septa.

Distribution

Known only from Port Shepstone, South Africa (Van der Horst 1927) to off south-eastern Mozambique; 49–457 m.

Dendrophyllia gaditana (Duncan, 1873)

Balanophyllia gaditana Duncan, 1873: 333.
?*Dendrophyllia minuscula*: Bourne, 1905: 213, pl. 2 (fig. 11, 11A).
Dendrophyllia praecipua Gardiner & Waugh, 1939: 240, pl. 1 (fig. 2).
?*Dendrophyllia* cf. *gaditana*: Best *et al.*, 1980: 621.
Non *Dendrophyllia minuscula*: Gardiner & Waugh, 1939: 237 (= *Enallopsammia rostrata*).
Non *Dendrophyllia minuscula*: Boshoff, 1981: 42 (= *Dendrophyllia ijimai*).
Non *Dendrophyllia* cf. *minuscula*: Fricke & Schuhmacher, 1983: 184, fig. 14a.
Dendrophyllia gaditana: Cairns, 1979: 181–182, pl. 36 (figs 5–10); 1984: 25, pl. 4 (fig. I) [synonymy].

New records

AB–371F, 1 branch, USNM 91821; AB–401B, 3 colonies, USNM 91822; V–2697, 1 colony, IOM; V–2753, 1 colony, IOM.

Distribution

Indian Ocean: off south-eastern and central Mozambique; off Pemba, Tanzania (Gardiner & Waugh 1939); ?Seychelles (Best *et al.* 1980); Madagascar Plateau near Walters Shoal; ?Gulf of Manaar (Bourne 1905); 65–480 m. Elsewhere: amphi-Atlantic, Java Sea, off Queensland, Hawaiian Islands (Cairns 1984), off Japan (Cairns in prep.); 73–505 m.

Dendrophyllia ijimai Yabe & Eguchi, 1934

Fig. 13G

Dendrophyllia ijimai Yabe & Eguchi, 1934: 2026. Eguchi, 1968: C65–C66, pl. C16 (figs 1–2), pl. C22 (fig. 1), pl. C30 (figs 4–5).
Dendrophyllia cf. *minuscula*: Scheer & Pillai, 1983: 170–171, pl. 39 (figs 5–10).
Dendrophyllia minuscula: Boshoff, 1981: 42.

New records

AB–394B, 1 colony, USNM 91844; Cruise 333, sta. 14, 1 colony, USNM 78543; off Zanzibar, 84 m, 1 colony, USNM 78544; MN–ZK21, 1 colony, USNM 91843. Reference material: 2 colonies from off Moroisa, Sagami Bay, USNM.

Diagnosis

Coralla large and arborescent, up to 23 cm wide and 20 cm in height, with a massive base up to 4 cm in diameter. Branches relatively straight and circular in cross-section, each gradually attenuating to a distal axial corallite 5–6 mm in diameter. Non-axial corallites circular to slightly elliptical and smaller (4,5–5,5 mm in diameter) than axials, arranged in three or four irregular rows along branch, each corallite projecting 2–8 mm perpendicular to branch or slightly tilted anteriorly. Theca striate, with well-delineated costae. Corallum white; dried tissue dark brown. Septa hexamerally arranged in four cycles; however, fourth cycle rarely complete in non-axial corallites, whereas some S_5 do occur in axials. S_1 independent and by far the largest septa. S_2 also independent but much smaller. S_3 smallest of septa, each enclosed by a larger pair of S_4. Columella large and spongy.

Remarks

These specimens appear to be identical to those reported as *Dendrophyllia* cf. *D. minuscula* by Scheer & Pillai (1983) from the Red Sea. *Dendrophyllia minuscula* Bourne, 1905, has much smaller corallites. Among the approximately 30 valid Recent species of *Dendrophyllia*, these south-west Indian Ocean specimens are indistinguishable from *D. ijimai*, previously known only from off Japan at 37–366 m. Superficially, this species resembles *Tubastraea micrantha* in colour and size, but differ in having septa arranged in the Pourtalès Plan.

Distribution

Off Durban (Boshoff 1981) and Zululand, South Africa; off Zanzibar, Tanzania; off Kenya; Red Sea (Scheer & Pillai 1983); 62–223 m. Elsewhere: off Japan, 37–366 m (Eguchi 1968).

Dendrophyllia fistula (Alcock, 1902*a*)

Balanophyllia (Thecopsammia) fistula Alcock, 1902*a*: 109; 1902*c*: 42, pl. 5 (fig. 36, 36a).
Thecopsammia fistula: von Marenzeller, 1907*a*: 8–9, text-fig. 6; 1907*b*: 16–17, pl. 1 (figs a–h).
Dendrophyllia fistula: Gardiner & Waugh, 1939: 237. Pillai & Scheer, 1976: 16. Scheer & Pillai, 1983: 170 [synonymy].
Non *Dendrophyllia fistula*: Wells, 1954: 472–473, pl. 180 (figs 1–3).
Non *Dendrophyllia fistula*: Eguchi, 1968: C63, pl. C12 (figs 4–6).

New record

V–2635, 1 colony, IOM. Reference material: 3 syntypes of *B. fistula* from *Siboga*–105, ZMA Coel. 564.

Remarks

Like *D. cornucopia* Pourtalès, 1871, *D. fistula* is an unattached, recumbent corallum bearing numerous buds of variable length and position on the primary corallite, rarely, if ever, having an intact third generation. The specimen reported by Wells (1954) from the Marshall Islands differs in colony and costal shape and in having higher generation buds present.

Those species of *Dendrophyllia* having an unattached, recumbent corallum with irregular budding of smaller coralla from its theca (as opposed to attached, sympodially branching colonies more typical of *Dendrophyllia*) were placed in the new subgenus *Dendrophyllia (Alcockia)* by Eguchi (1968), but the name *Alcockia* is a junior homonym of a fish genus (Goode & Beane 1895) and thus will require a replacement name.

Distribution

Indian Ocean: off south-eastern Mozambique; off Zanzibar, Tanzania (Gardiner & Waugh 1939); Red Sea (Von Marenzeller 1907*a*, 1907*b*; Gardiner & Waugh 1939; Scheer & Pillai 1983); Maldive Islands (Gardiner & Waugh 1939); 210–900 m. Elsewhere: Sulu Sea (Alcock 1902*a*, 1902*c*); 270–275 m.

Genus *Enallopsammia*

Enallopsammia rostrata (Pourtalès, 1878)

Amphihelia rostrata Pourtalès, 1878: 204, pl. 1 (figs 4–5).
Anisopsammia rostrata: von Marenzeller, 1904: 314–315, pl. 18 (fig. 23).
Madrepora ramea: Gardiner & Waugh, 1939: 226–227.
Dendrophyllia minuscula: Gardiner & Waugh, 1939: 237.
Non *Dendrophyllia amphelioides*: Gardiner & Waugh, 1939: 238.
Enallopsammia rostrata: Cairns, 1982: 57, pl. 18 (figs 1–4) [synonymy]; 1984: 27–28. Zibrowius & Gili, 1990: 39–42, pl. 6 (figs A–F), pl. 7 (figs A–F).
Enallopsammia amphelioides: Zibrowius, 1973: 45–48, figs 16–20 [synonymy]; 1980: 203–204, pl. 106 (figs D–I) [synonymy]. Zibrowius & Grygier, 1985: 131, 134, fig. 51.

New record

V–2731, 1 branch, IOM.

Distribution

Indian Ocean: off Comores Islands (Zibrowius 1982; Zibrowius & Grygier 1985); off Reunion (Zibrowius & Grygier 1985); Madagascar Plateau off Walters Shoal (Zibrowius 1982); off Maldive Islands (Gardiner & Waugh 1939); off Nicobar Islands (Von Marenzeller 1904); 229–805 m. Elsewhere: amphi-Atlantic, west and central Pacific, New Zealand region; 229–2 165 m (Cairns 1982).

Genus *Tubastraea*

Tubastraea micrantha (Ehrenberg, 1834)

Oculina micranthus Ehrenberg, 1834: 304.
Dendrophyllia nigrescens Dana, 1846: 387.
Coenopsammia viridis Milne Edwards & Haime, 1848*b*: 110.
Dendrophyllia micranthus: van der Horst, 1926: 43–44, pl. 2 (figs 6–7). Scheer & Pillai, 1974: 63, pl. 29 (fig. 3). Pillai & Scheer, 1976: 16.
Dendrophyllia cf. *micrantha*: Best *et al.*, 1980: 621.
Tubastraea micranthus: Macnae & Kalk, 1958: 123. Scheer & Pillai, 1983: 175–176, pl. 41 (figs 7–8) [synonymy]. Schuhmacher, 1984: 94–98, fig. 1a–b [synonymy]. Zibrowius & Grygier, 1985: 1039.
Tubastraea micrantha: Pichon, 1978: 441. Rosen, 1979: 20. Wells, 1983 [synonymy].

New records

Aldabra, 15 colonies, USNM 79137, 79138, 79140, 79143, 91832; Nossi Bé, Madagascar, 2 colonies, USNM 91833–34; Rodriques Island, 1 colony, USNM 22018.

Remarks

This species is easily distinguished from the five other valid species in the genus (*T. coccinea* Lesson, 1829; *T. diaphana* (Dana, 1846); *T. tagusensis* Wells, 1982; *T. floreana* Wells, 1982; and *T. faulkneri* Wells, 1982) by having arborescent, sympodially branched coralla, the others having phaceloid or plocoid colonies.

Distribution

Indian Ocean: off Mozambique (Macnae & Kalk 1958) to the Red Sea (Scheer & Pillai 1983); Comores Islands (Schuhmacher 1984); Seychelles (Milne Edwards & Haime 1848*b*; Best *et al.* 1980); off Madagascar (Pichon 1978); off Mauritius, Maldive and Nicobar islands (Scheer & Pillai 1974); 0,5–55 m. Elsewhere: western Pacific (Schuhmacher 1984).

Tubastraea coccinea Lesson, 1829

Tubastraea coccinea Lesson, 1829: 93. Wells, 1983: 243–244, pl. 18 (figs 1–2) [synonymy]. Cairns, 1991: 26–27, pl. 12 (figs c–e).
Lobophyllia aurea Quoy & Gaimard, 1833: 195, pl. 15 (figs 7–11).
Coenopsammia ehrenbergiana Milne Edwards & Haime, 1848*b*: 109, pl. 1 (fig. 12).
Non *Dendrophyllia coccinea*: van der Horst, 1926: 45 (= *Dendrophyllia* sp. cf. *D. horsti*).
Non *Dendrophyllia aurea*: van der Horst, 1926: 46–48 (= *T. faulkneri*).
Dendrophyllia aurea: Macnae & Kalk, 1958: 123.
Non *Tubastraea coccinea*: Scheer & Pillai, 1983: 175, pl. 41 (figs 5–6).
Tubastraea aurea: Pichon, 1964: 191; 1978: 441. Best *et al.*, 1980: 621. Scheer & Pillai, 1983: 173–174, pl. 40 (fig. 8) [synonymy]. Schuhmacher, 1984: 94–95.
?*Tubastraea* sp. Zibrowius & Grygier, 1985: 130.

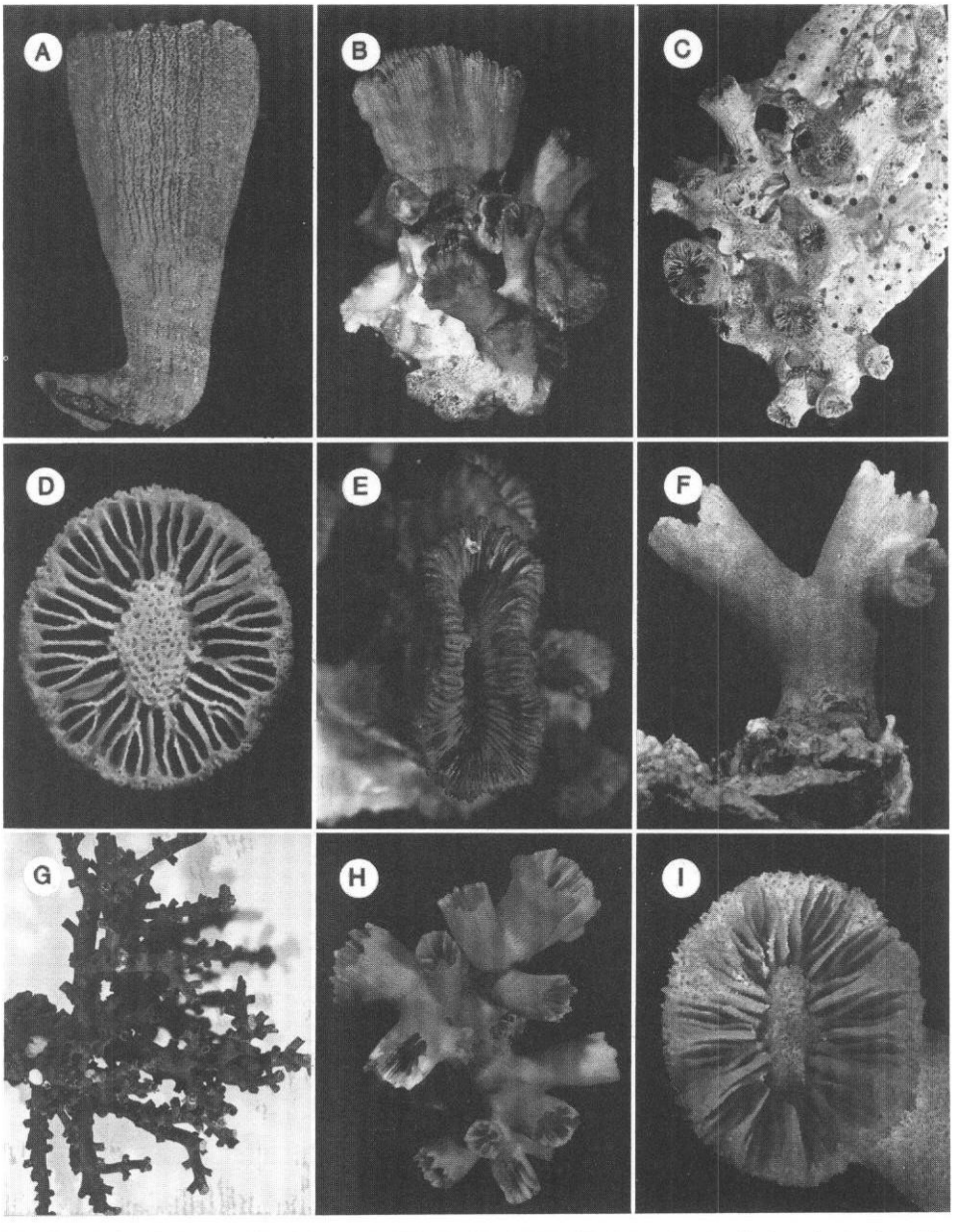

Fig. 13. A, D. *Balanophyllia diffusa*, Cr. 329–15, USNM 78594, lateral and calicular views. A × 2,7, D × 3,6. B, E. *Rhizopsammia compacta*, MN–ZA49 (USNM 91793) lateral view of a colony and calice of largest corallite. B × 1,1, E × 1,8. C. *Rhizopsammia annae*, AB–391J, USNM 91790, a small colony. × 1,4. F, I. *Dendrophyllia* sp. cf. *D. horsti*, MN–ZC11, USNM 91819, lateral view of colony and calice of a corallite. F × 1,2, I × 3,7. G. *Dendrophyllia ijimai*, AB–394B, USNM 91844, colony with dried black tissue. × 0,25. H. *Tubastraea diaphana*, Nossi Bé, Madagascar, USNM 91838, colony. × 0,8.

New records

Aldabra, 0–2 m, 6 colonies, USNM 79139 and 79141; Nossi Bé, Madagascar, 2 colonies, USNM 91836–37.

Remarks

This species is distinguished from the other two species known from the Indian Ocean by having a plocoid corallum, not dendroid or bushy. *Tubastraea coccinea* was compared to the three eastern Pacific species by Cairns (1991, table 4).

Distribution

Indian Ocean: off south-eastern Mozambique (Macnae & Kalk 1958); Madagascar (Pichon 1974, 1978); Seychelles (Milne Edwards & Haime 1848*b*); Red Sea (Lesson 1829); Chagos Islands; Maldive Islands; Gulf of Manaar; Mergui Archipelago (Dana 1846); reef depth. Elsewhere: Pacific (Scheer & Pillai 1983); off Japan (Eguchi 1968); Galápagos and Cocos islands (Cairns 1991); western Atlantic (Cairns 1979); 1,5–110 m.

Tubastraea diaphana (Dana, 1846)

Fig. 13H

Dendrophyllia diaphana Dana, 1846: 389, pl. 27 (fig. 3).
Tubastraea diaphana: Scheer & Pillai, 1983: 174, pl. 41 (figs 1–4) [synonymy]. Wells, 1983: 243.
Tubastraea coccinea: Pillai & Scheer, 1976: 17. Scheer & Pillai, 1983: 175, pl. 41 (figs 5–6).

New records

Off Zanzibar, Tanzania, 1 colony, USNM 83697; Nossi Bé, Madagascar, 2 colonies, USNM 91838–39; southern coast of Natal, 9–15 m, 1 colony, USNM 91840.

Remarks

Similar to *T. coccinea* in septal arrangement, but colony forms small clumps or bushes with frequent budding from corallite walls instead of basal coenosteum.

Distribution

Indian Ocean: off Natal, South Africa; off Zanzibar, Tanzania; off north-western Madagascar; Red Sea (Scheer & Pillai 1983); shallow. Elsewhere: off Singapore (Dana 1846); central Pacific; Great Barrier Reef (Scheer & Pillai 1983); reef depths.

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APPENDIX

STATION LIST

Station number	Latitude (°S)	Longitude (°E)	Depth (m)	Date
R.V. *Anton Bruun* (AB)				
357B	29°11'	32°02'	69	30 July 1964
357E	29°10'	32°05'	168	30 July 1964
358A	29°19'	32°00'	366	30 July 1964
358C	29°21'	31°58'	366	30 July 1964
365C	23°19'	43°33'	439	12 August 1964
365D	23°20'	43°32'	475–695	12 August 1964
369J	24°12'	36°01'	1 140	17 August 1964
370D	24°28'	35°36'	880	18 August 1964
370G	24°20'	35°28'	347	18 August 1964
370H	24°41'	35°28'	311–320	18 August 1964
371E	24°46'	35°20'	132	18 August 1964
371F	24°46'	35°18'	110	18 August 1964
371G	24°49'	35°13'	73	18 August 1964
372B	24°48'	34°59'	42	19 August 1964
372G	24°53'	34°56'	55	19 August 1964
372J	25°07'	34°34'	106	19 August 1964
372L	25°07'	34°34'	112	19 August 1964
372P	25°57'	33°02'	37	22 August 1964
373B	26°00'	33°05'	135	22 August 1964
373H	26°58'	33°54'	896	22 August 1964
373J	26°58'	33°53'	880	22 August 1964
374D	27°08'	34°05'	1 326	23 August 1964
389C	30°12'	32°01'	1 360	7 September 1964
389E	30°09'	31°37'	930	7 September 1964
390S	29°35'	31°42'	138	9 September 1964
391H	29°21'	31°35'	57	9 September 1964
391J	29°21'	31°35'	57	9 September 1964
392J	29°19'	31°26'	38	10 September 1964
394B	29°27'	31°31'	68–70	25 September 1964
399A	22°33'	36°10'	925	1 October 1964
399B	22°30'	36°07'	850–960	1 October 1964
399C	21°18'	36°18'	1 510–1 600	2 October 1964
401B	19°50'	36°21'	65	4 October 1964
400C	20°30'	35°43'	62	3 October 1964
408D	16°42'	43°19'	150–300	15 October 1964
409E	16°11'	43°42'	62	18 October 1964
421A	02°54'	40°23'	34	7 November 1964
421G	02°56'	40°28'	240	8 November 1964
R.V. *Vityaz* (V)				
2608	12°28'	48°18'	780	14 November 1988
2626	24°42'	35°31'	320	22 November 1988
2629	25°28'	35°36'	1 250–1 520	23 November 1988
2631	25°30'	35°08'	490–535	23 November 1988
2634	25°05'	34°50'	90–92	25 November 1988
2635	25°05'	35°15'	110–230	25 November 1988
2637	25°13'	35°32'	980–1 000	26 November 1988
2644	22°19'	43°06'	330–335	2 December 1988
2650	22°22'	42°59'	950–960	3 December 1988
2653	22°17'	42°50'	1 440–1 510	3 December 1988
2662	22°14'	43°07'	310–315	4 December 1988
2668	33°01'	44°09'	1 010	8 December 1988

Station number	Latitude (°S)	Longitude (°E)	Depth (m)	Date
R.V. *Viryaz* (V) (*cont.*)				
2671	32°56'	45°01'	1 175	9 December 1988
2674	38°01'	45°27'	1 600-1 610	10 December 1988
2686	33°04'	43°52'	650-665	12 December 1988
2697	33°15'	43°55'	160	13 December 1988
2699	33°18'	43°54'	530-610	14 December 1988
2706	33°03'	44°33'	970-980	15 December 1988
2716	33°17'	44°55'	630-680	16 December 1988
2721	32°25'	43°37'	1 000-1 030	17 December 1988
2722	32°25'	43°37'	680-720	17 December 1988
2724	33°09'	43°50'	280-360	17 December 1988
2731	33°18'	44°08'	750-755	18 December 1988
2733	33°23'	44°06'	750-755	18 December 1988
2753	33°17'	43°52'	410-480	22 December 1988
2764	33°10'	43°41'	910-920	24 December 1988
2767	33°08'	45°49'	260	24 December 1988
2803	11°21'	61°44'	87-110	7 January 1989
2804	11°06'	62°14'	230-235	7 January 1989
2809	10°29'	61°09'	110-115	8 January 1989
2814	09°38'	60°50'	1 650-1 700	9 January 1989
2815	09°40'	60°30'	1 520-1 720	9 January 1989
2816	09°31'	59°55'	430-835	9 January 1989
R.V. *Meiring Naude* (MN)				
SM-129	30°53,4'	30°31,7'	850	11 May 1977
SM-162	32°55,0'	28°31,0'	630	25 May 1978
SM-174	33°19,6'	27°52,4'	760	28 May 1978
SM-226	32°28,6'	28°58,8'	710-775	24 June 1979
SM-232	32°14,9'	29°10,4'	620-650	25 June 1979
XX-153	29°32,2'	31°19,8'	50	1 June 1990
ZA-43	26°54,0'	32°55,1'	43	3 June 1990
ZA-48	26°53,5'	32°55,6'	51	3 June 1990
ZA-49	26°54,3'	32°55,5'	45	3 June 1990
ZA-51	26°52,8'	32°56,0'	65	4 June 1990
ZB-11	27°00,2'	32°54,3'	68	5 June 1990
ZB-14	27°00,8'	32°54,3'	51	5 June 1990
ZB-17	27°00,3'	32°55,3'	67	6 June 1990
ZB-18	27°00,4'	32°55,2'	66	6 June 1990
ZB-20	27°01,1'	32°55,1'	69-73	6 June 1990
ZB-23	27°03,0'	32°54,7'	78	6 June 1990
ZB-24	27°03,6'	32°54,5'	70	6 June 1990
ZB-25	27°03,7'	32°53,4'	55	6 June 1990
ZB-27	27°03,9'	32°53,0'	44	6 June 1990
ZC-9	27°04,8'	32°53,5'	65	7 June 1990
ZC-10	27°06,0'	32°53,3'	74	7 June 1990
ZC-11	27°06,8'	32°52,9'	74	7 June 1990
ZD-4	27°11,1'	32°50,9'	100	7 June 1990
ZD-5	27°11,9'	32°50,2'	80	7 June 1990
ZD-6	27°13,0'	32°49,7'	72	7 June 1990
ZD-7	27°12,9'	32°49,7'	66-71	8 June 1990
ZD-8	27°13,1'	32°49,5'	60	8 June 1990
ZD-10	27°11,5'	32°50,4'	78	8 June 1990
ZH-18	27°31,8'	32°42,8'	70	2 June 1990
ZH-19	27°32,8'	32°42,8'	77	2 June 1990
ZH-23	27°33,8'	32°42,5'	64	2 June 1990
ZH-26	27°34,2'	32°42,1'	62-64	2 June 1990
ZH-27	27°35,6'	32°41,6'	62	2 June 1990

Station number	Latitude (°S)	Longitude (°E)	Depth (m)	Date
R.V. *Meiring Naude* (MN) (*cont.*)				
ZK-20	27°47,7'	32°34,0'	70-80	9 June 1990
ZK-21	27°47,6'	32°39,1'	62-84	9 June 1990
ZK-25	27°46,4'	32°39,4'	63-70	9 June 1990
ZL-3	27°54,3'	32°38,0'	105	9 June 1988
ZQ-8a	29°05,3'	32°08,3'	95	17 June 1989
ZU-13	29°31,8'	31°27,9'	110	19 June 1989
ZU-15	29°39,8'	31°30,1'	150	19 June 1989
ZV-5	29°44,3'	31°27,6'	300	20 June 1989
ZV-20	29°41,6'	31°21,0'	85	21 June 1989
ZV-21	29°41,4'	31°21,3'	85	21 June 1989
ZW-6	29°45,9'	31°17,6'	105	21 June 1989
ZW-8	29°45,9'	31°18,2'	105	21 June 1989
ZCC-1	27°08,3'	32°52,2'	98	7 June 1990
ZCC-2	27°09,9'	32°51,0'	150	7 June 1990
ZDD-2	27°14,6'	32°48,8'	74	7 June 1990
ZDD-3	27°13,5'	32°49,5'	74	8 June 1990
ZDD-4	27°13,6'	32°49,3'	75	8 June 1990
ZDD-5	27°13,5'	32°49,8'	78	8 June 1990
ZDD-7	27°13,9'	32°49,3'	66-82	8 June 1990
Miscellaneous stations				
Vema				
14-SAT6	29°48'	31°16'	232	23 April 1958
19-28	35°40'	21°59'	165	?
Marion Dufresne (Cruise 27)				
Sta. 4	08°29'N	79°19'	1 095	28 July 1981
Sardinops				
CD32	34°13,9'	18°29,3'	37	10 April 1971

EAMFRO (East African Marine Fisheries Research Organization, Zanzibar)

Station number	Locality	Latitude (°S)	Longitude (°E)	Depth (m)	Date
C13	north Kenya Banks	—	—	122	25 Feb 1971
Unknown vessel					
Cr. 329-10	off Zanzibar	—	—	183	11 August 1971
Cr. 329-15	off Zanzibar	—	—	273	11 August 1971
Cr. 333-14	—	02°40,5'	41°00,7'	223	9 December 1971
Manihine					
381-1		04°13'	39°41,5'	250	24 October 1974
381-3		05°27'	39°09'	302	24 October 1974
381-63		07°32'	39°52,6'	240	31 October 1974