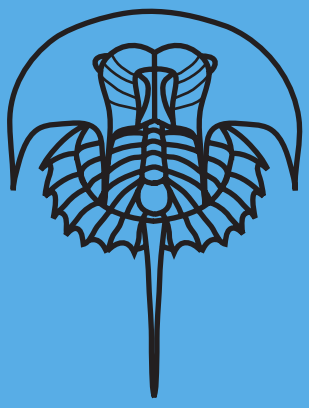

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Part F, Revised, Volume 2, Chapter 16: Systematic Descriptions of the Scleractinia Family Fungiacyathidae

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PART F, REVISED, VOLUME 2, CHAPTER 16: SYSTEMATIC DESCRIPTIONS OF THE SCLERACTINIA FAMILY FUNGIACYATHIDAE

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INTRODUCTION

The fungiacyathids are known from the Late Cretaceous (Campanian) to the present. Living species are found in all ocean basins, including off continental Antarctica, at depths of 69–6328 m, the greatest depth at which any living scleractinian has been collected (KELLER, 1976). The deeper-living species occur well below the calcium carbonate (aragonite) compensation depth (typically at 2000–3000 m). Fungiacyathids are exclusively azooxanthellate and solitary in growth form, always unattached, laying free on soft substrates. The largest known specimen is 62 mm in calicular diameter (CAIRNS & ZIBROWIUS, 1997), but most species are less than 25 mm in diameter. Their corallum is usually extremely fragile and, therefore, usually damaged during collection.

Family FUNGIACYATHIDAE Chevalier & Beauvais, 1987

[Fungiacyathidae CHEVALIER & BEAUVAIS, 1987, p. 705]

Corallum solitary, free, completely invested by polyp, usually cupolate, with flat to concave basal theca microstructurally similar to septa, i.e., comprised of closely spaced rapid accretion deposits (*sensu* STOLARSKI & others, 2011); wall homologous to marginotheca and trabeculotheca in conical coralla; azooxanthellate; septa laminar and imperforate, comprised of single fan system of closely spaced rapid accretion deposits (Fig. 1); septal axial edges often bear tall septal spines; adjacent septa united by T- or Y-shaped synapticular plates that originate from thecal base; endotheca and dissepiments absent; paliform structures present or absent; septa hexamerally arranged [Emended from CHEVALIER & BEAUVAIS, 1987, p. 705; WELLS, 1956, p. 390; CAIRNS 1989, p. 5.] *Upper Cretaceous (Campanian)–Holocene.*

Fungiacyathus SARS, 1872, p. 58 [**F. fragilis* SARS, 1872, p. 58, pl. 5,*24–32;* M; four syntypes, Oslo Museum B626 (see ZIBROWIUS, 1980); type species best described by ZIBROWIUS (1980) and CAIRNS (1982)] [=*Bathytrochus* GRAVIER, 1915, p. 8 (type, *Fungiacyathus (B.) marenzelleri* VAUGHAN, 1906, p. 66, M); juvenile type specimen should be at the MOM, but according to ZIBROWIUS (1980), the wrong specimen is curated as the type]. Corallum solitary, free, completely invested by polyp, usually cupolate, often with very fragile flat to concave basal theca (homologous to marginotheca and trabeculotheca in conical coralla), comprised of closely spaced rapid accretion deposits (*sensu* STOLARSKI & others, 2011); costae usually thin and serrate but may be rounded and granular; septa and costae in direct correspondence with one another; septal lateral faces usually carinate; septa hexamerally arranged in four or five cycles (in type species); Septa laminar and imperforate, comprised of single fan system of closely spaced rapid accretion deposits, and usually bearing tall septal spines at septal axial edges; adjacent septa united by T- or Y-shaped synapticular plates that originate from thecal base; paliform structures present or absent; columella spongy to irregular trabecular; endotheca and dissepiments absent; azooxanthellate; exclusively ahermatypic (see

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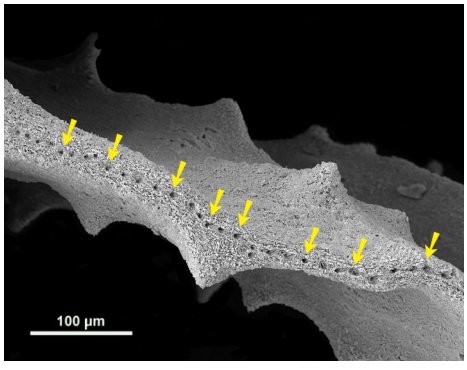

FIG. 1. Micromorphological features in septum of *Fungiacyathus,* showing series of rapid accretion deposits (RAD) (*arrows*) (new; J. Stolarski).

CHEVALIER & BEAUVAIS, 1987); together with the micrabaciid genus *Leptopenus* MOSELEY, 1881, which has a depth range of 49–5000 m. [*Fungiacyathus* is the deepest living scleractinian coral (69–6328 m depth). Fossil species best described by FILKORN (1994, p. 29–37) and BARON-SZABO (2008, p. 99–101)].

F. (Fungiacyathus) SARS, 1872, p. 58 [**F. fragilis* SARS, 1872, p. 58, pl. 5,*24–32;* M] Having the skeletal features of *Fungiacyathus* but always having five cycles of septa. *Upper Cretaceous (Campanian)–Holocene:* Antarctica, *Campanian–Maastrichtian;* ?North Africa, *Paleocene;* Australasia, Caribbean, *Eocene;* southern Europe, *Pliocene;* East Asia, Melanesia, *Pleistocene;* Atlantic Ocean (Gulf of Gascoigne at 4380 m depth, Norway [Lofoten] at 366–548 m depth), Pacific Ocean, Albatross Station 4125 at 1761–2056 m depth, and Eltanin Station 1412 and 1846 at 659–798 m and 1693 m depth, respectively], *Holocene.*——FIG. 2, *1a–b*. **F. fragilis,* Holocene, Norway (Skråven), 366–549 m depth, syntype, Oslo Museum B626; *a,* calicular view (Zibrowius, 1980, pl. 5,A); *b,* close-up of *a,* detail of peripheral zone (Zibrowius, 1980, pl. 5,B).——FIG. 3,*1*. **F. fragilis,* Holocene, calicular view, Albatross Station 4125 (between Oahu and Kauai Islands, Hawaii) at 1761–2056 m depth, NMNH (USNM) 20834 (Cairns, 1982, pl. 1,*4*).——FIG. 3, *4a–b*. *F. deltoidophorus* (FELIX, 1909); Maastrichtian, Lopez de Bertodano Formation, Seymour Island, USNM 93024; *a,* calicular view (new; Stolarski); *b,* basal view (new; J. Stolarski).——FIG. 4,*1a–2*. *Fungiacyathus* (*F.*) *stephanus* (ALCOCK, 1893); *1a–d*, Holocene, N. Caledonia, MUSORSTOM 5, DC 358, 680–700 m depth, ZPAL, no catalogue number; *a,* basal view of corallum with semi-transparent theca (*arrows* indicate fanlike arrangement of rapid accretion deposits); *b,* distal view of septum with slightly etched closely spaced rapid accretion deposits (*arrows*); *c,* close-up of *b; d,* view of closely spaced rapid accretion deposits in thin-sectioned septum (*arrows*); *2,* Holocene, Vanuatu, North Fiji Basin, Guyot Bougainville, MUSORSTOM 8, Station 1129, 1014–1050 m depth, USNM 98540, polished basal part of corallum showing remnants of horizontal theca and vertical septa both of which are comprised of closely spaced rapid accretion

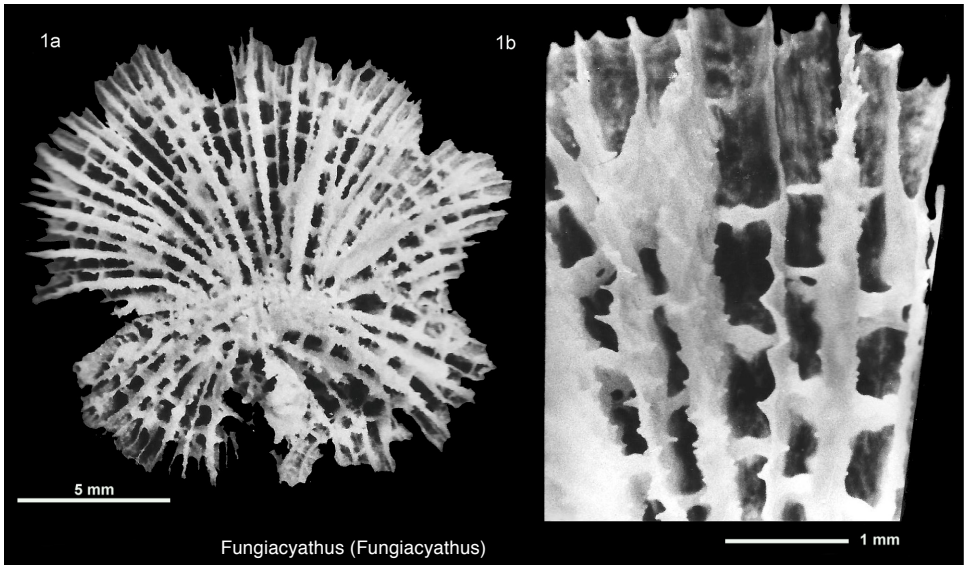

FIG. 2. Fungiacyathidae (p. 2).

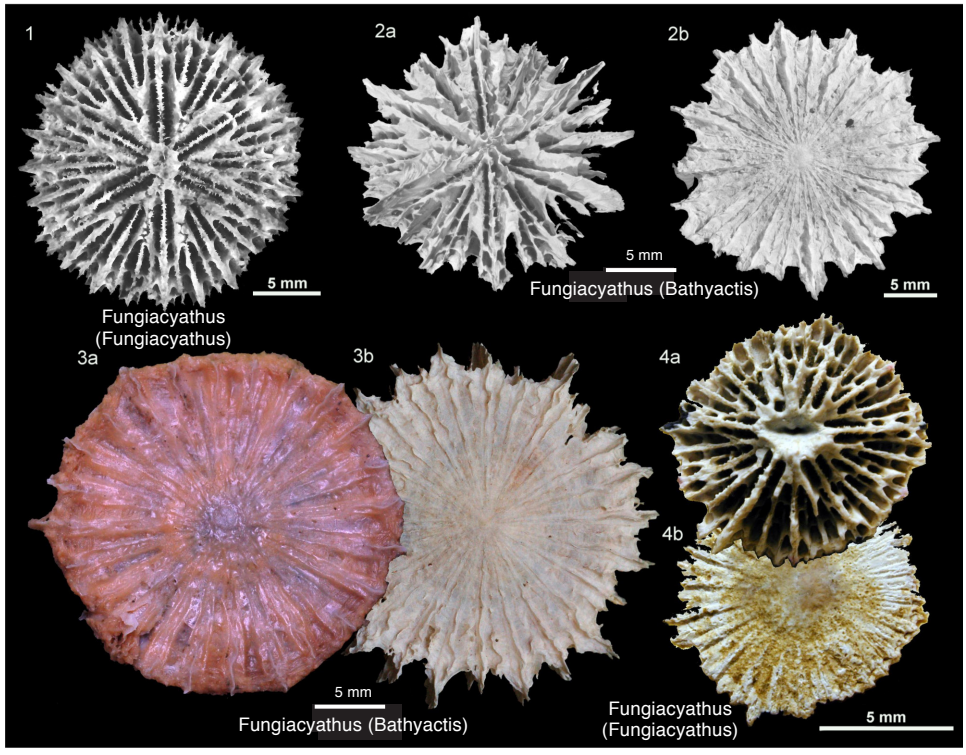

FIG. 3. Fungiacyathidae (p. 2–3).

deposits; synapticulae developed between septa (new; all images by J. Stolarski).

F. (Bathyactis) MOSELEY, 1881, p. 185 [**Fungia symmetrica* POURTALÈS, 1871, p. 46, pl. 7,*5–6;* M; two syntypes, MCZ 276; one syntype lost according to CAIRNS (1989); genus best described by CAIRNS (1989; 1999)]. Having the skeletal features of *Fungiacyathus* but only four cycles of septa. *Upper Cretaceous (Maastrichtian)–Holocene:* Australasia, *Maastrichtian;* Australasia, *Oligocene–Miocene;* Caribbean, *Miocene;* East Asia, *Pleistocene;* western Atlantic Ocean (Strait of Florida at 640–823 m depth), northern Pacific Ocean (Vityaz, at 4820 m depth), *Holocene*.——FIG. 3,*2a–b. F. (B). marenzelleri* VAUGHAN, 1906 (=paratype of *F. symmetricus aleuticus* KELLER, 1976), IOM (no catalogue number), Vityaz 6143 (51°40′N, 163°00″W), 4820 m depth; *a,* calicular view, slightly oblique (Cairns, 1994, p.109, fig. 1c); *b,* base of corallum (Cairns, 1994, p.109, fig. 1d).——FIG. 3,*3a–b. F. (B). marenzelleri* VAUGHAN, 1906, Kurile-Kamchatka Trench, IOM (no catalogue number), 6136–6117 m depth); *a,* base of corallum completely covered by the soft tissue; *b,* base of the same corallum without soft tissue (images, courtesy of Tina Molodtsova).

ABBREVIATIONS FOR MUSEUM REPOSITORIES

IOM: Institute of Okeanology, Moscow, Russia
MCZ: Museum of Comparative Zoology, Harvard University, Cambridge, USA
MOM: Musée Océanographique, Monaco.
NMNH: National Museum of Natural History, Smithsonian Institution, Washington, D.C., USA
USNM: United States National Museum, Washington, D.C. (collections of which are now in the NMNH)
ZPAL: Institute of Paleobiology, Polish Academy of Sciences, Poland

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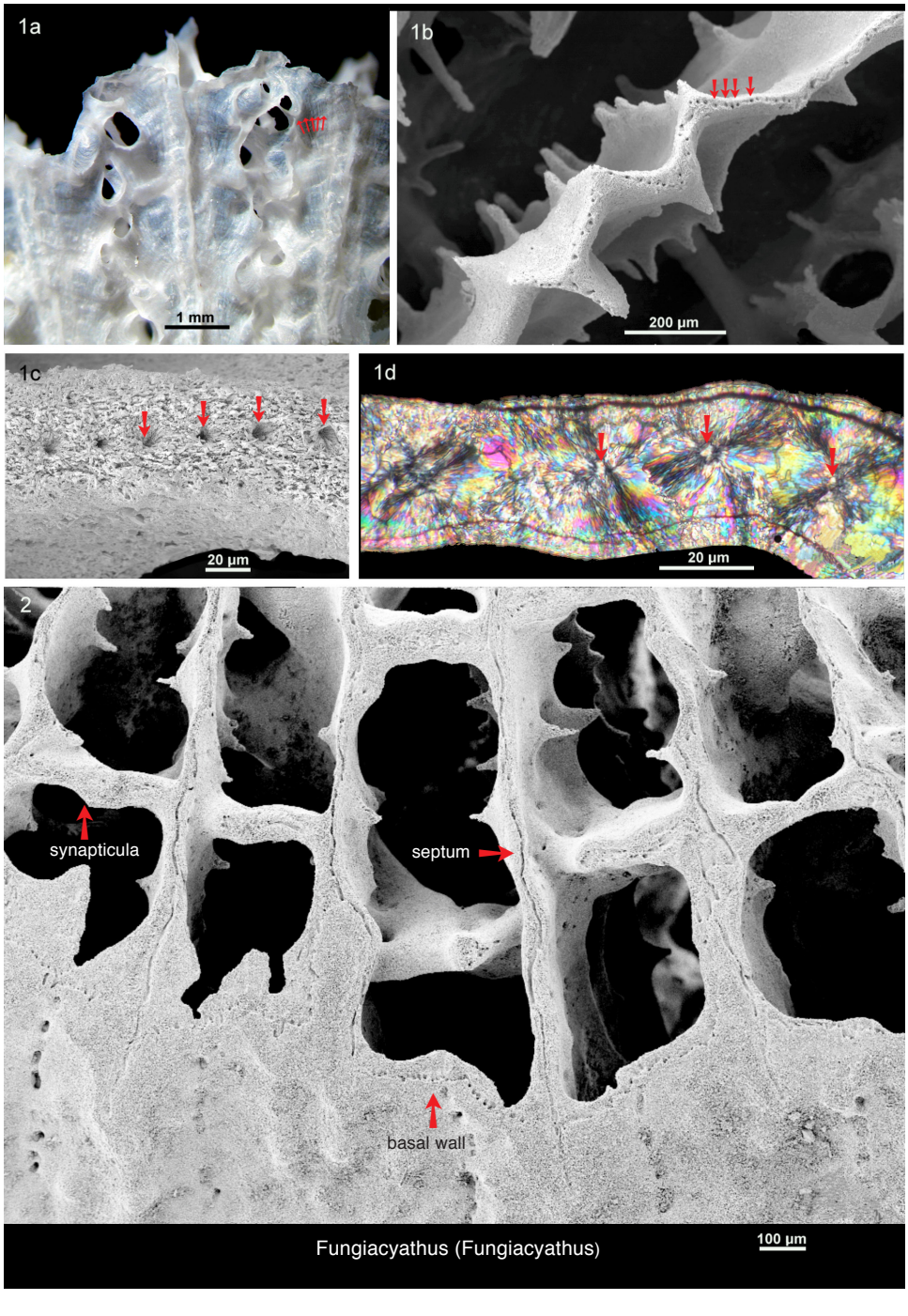

Fig. 4. Fungiacyathidae (p. 2).

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