ANNOTATED CHECKLIST OF SPONGES (PORIFERA) OF THE SOUTH CHINA SEA REGION

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ABSTRACT. - Many important scientific collections of Porifera have been made within the South China Sea region, commencing in the late 1700s during the era of the "spice trade", but no synthesis or inventory of this fauna had so far been attempted. This annotated systematic checklist of marine sponges contains over 1500 species recorded in the scientific literature (including marine natural products records), or so far unpublished collections known to exist in museums. As for many other marine invertebrate phyla the South China Sea region contains an exceptionally high diversity of sponges, with an expectation that many more species await discovery and description. This checklist indicates that about 5% of the fauna is widely distributed in the Indo-west Pacific, mainly associated with the coral reef fauna, some wide Indo-Pacific species, a few known to be introduced through human activities, whereas most appear to be "endemic" to this region. This latter group is relatively more specialised in its ecological requirements than widespread coral reef species, living on non-emergent deeper reefs, soft bottoms, trawl grounds and other habitats which are rarely considered in conservation strategies. These strategies are discussed as they relate to particular characteristics of the sponge fauna.

KEY WORDS. - Porifera, species inventory, South China Sea, biodiversity, conservation strategies.

CONTENTS

Introduction .................................................................................................................. 126
Repositories for important collections ..................................................................... 128
Notes on the species list ............................................................................................ 129
Key to classes and orders of sponges ......................................................................... 130
Systematic checklist of sponges ............................................................................... 131
Phylum Porifera ......................................................................................................... 131
INTRODUCTION

Sponges (Porifera) are amongst the most difficult of metazoan phyla to identify. Much of the current taxonomic framework, based largely on skeletal morphology, derives from work published last century. Consequently the classification is laden with species, generic and family synonyms. More recently, contemporary authors have incorporated other forms of biological evidence into this framework but this effort is far from complete. Although contemporary classification and nomenclature are now both approaching stability (at least compared with earlier efforts; see introductions in Hooper & Wiedenmayer, 1994), it is still extremely difficult to resolve much of this new biological evidence (biochemistry, genetic, reproductive cytological etc. data) within the morphologically-based classification.
It is still common for sponges to be misidentified and misplaced within the classification. This makes it very difficult to compile accurate regional species inventories and to determine what proportion of the regional fauna is unique (endemic) and which species are truly widely distributed amongst adjacent biogeographic provinces. Two recent comprehensive inventories of the Australian and New Zealand sponge faunas (Hooper & Wiedenmayer, 1994; Dawson, 1993), were each many years in preparation. These inventories often involved substantial taxonomic revisions, and consequently they were able to resolve nomenclatural complexities and species synonymies for the Australian and New Zealand faunas, and to provide realistic estimates of biodiversity within these provinces. Conversely, attempting something of similar complexity for the South China Sea region is not possible given constraints of time and resources. Instead, we provide a ‘database list’ of recorded species without attempting to resolve all possible synonyms and misidentifications. Although this product is less desirable than complete taxonomic revisions it does provide us with the groundwork to estimate the magnitude and diversity of this important resource. However, to make this document more useful to subsequent workers, to eventually provide the basis for an accurate and comprehensive inventory, we include ordinal and family diagnoses for each taxon which we believe will allow species encountered in the future to be placed more accurately within the classification. A more comprehensive taxonomic guide to sponges, including generic diagnoses and synonyms, methods of collection and preparation for taxonomy, can be found on the internet at “http://www.qmuseum.qld.gov.au” (Hooper, 1997).

The earliest scientific descriptions of sponges collected from the South China Sea are from the late 1700s to the mid 1800s (Esper, 1797-1830 [revised by Ehlers, 1870]; Grant, 1836; Gray, 1858-70; Bowerbank & Norman, 1869a,b; Harting, 1870; Bowerbank, 1872-1877), based on material usually obtained serendipitously by European merchants trading with private collectors, and occasionally collections made during early scientific and technical surveys (e.g. “La Bonite” expedition to the “Indochina” region in 1838 (Dawydoiff, 1952); telegraph cable laying mission by the Great Northern Telegraph Company (with sponges subsequently described by Lindgren, 1897)). Some of this material still survives (albeit as antiquated dry specimens) in the BMNH London, Upsala Museum Sweden and MNHN Paris, with only vague localities given as “East Indies”, “Indochina”, “Cochinchina”, “Indo-Malay region” etc. In most cases published descriptions of these species are very poor, usually not illustrated, and many are still unrecognisable, or at best poorly known, as to their true life characteristics.

During the latter part of the 1800s several European scientific and exploratory expeditions collected many species from this region, with more detailed scientific descriptions provided by Carter (1883-7), Poléjaeff (1884a,b), Ridley & Dendy (1886-7), Sollas (1886-8), Kieschnick (1896-1900), Lindgren (1897-8), Topsent (1897), Schulze (1898) and Thiele (1899-1903). Although scientific interest in sponges continued into the first three decades of this century (Sollas, 1902; Vosmaer, 1902-11; Dragnewitsch, 1905; Lendenfeld, 1907; Hentschel, 1912; Wilson, 1925; Ijima, 1926; Burton, 1928-32; Dendy & Burton, 1926; de Laubenfels, 1935; Dawydoiff, 1952 [with sponges identified by Topsent]), only few papers on South China Sea sponges have been published in recent years (see Bibliography below). To date, over 1500 species have been described, or are known to exist in contemporary collections, from this region. However, there are certainly many more species living in the South China Sea region given that it lies in close proximity to the megadiverse fauna centred around the Indo-Malay archipelago (see Hooper & Lévi, 1994).

The present work provides: (a) an annotated systematic checklist of sponge species described in the scientific literature (including marine natural products literature), specifying locality
Hooper et al.: Sponges of the South China Sea

(where known) or broad region of collection; (b) also incorporating a list of identified (but so far unpublished) specimens collected recently from this region, housed in several museums and universities throughout the world; (c) a list of the major repositories of voucher specimens, including the important larger expeditions that visited these waters; and (d) a discussion of known rare or endemic species, predicted areas of highest biodiversity, estimates of the magnitude of the sponge biodiversity, and comments on the conservation and preservation of this biodiversity.

REPOSITORIES OF IMPORTANT COLLECTIONS

Many sponge collections have already been made within the South China Sea region, ranging from old colonial expeditions (dredging, trawling) to contemporary collections using SCUBA and underwater photography. Unfortunately there has never been any coordinated effort to compile a common database of these collections, which are scattered throughout museums and universities worldwide.

Major collections include:

Zoological Museum Amsterdam, Netherlands (ZMA): published and unpublished species collected during the *Siboga* (1899-1900) and the Dutch-Indonesian *Snellius II* expeditions (1984-85), and more contemporary collections made by Rob van Soest and associates.

Natural History Museum London, England (BMNH): extensive early collections of sponges from British colonial territories and smaller expeditions in the South China Sea, published by authors such as Bowerbank, Carter, Dendy, Burton, plus more recent collections from Sabah and Brunei made during ecological surveys of reefs by the BMNH in these regions.

Muséum National d’Histoire Naturelle Paris, France (MNHN): small collections made in French colonial waters of the “Indochina” region (Vietnam, Cambodia) published by Topsent, and more recent collections from Zamboanga (Philippines) and Nha Trang (Vietnam) published by Lévi (1961a,b).

Uppsala Museum, Sweden: small collections from “Indochina” (Java to Vietnam), described by Lindgren (1897).

Smithsonian Institution Washington, USA (USNM): these collections include species described by Wilson (1925) from the *Albatross* expedition, as well as much more extensive, contemporary collections from Malaysia, Singapore, Indonesia, Thailand, Hong Kong and Philippines, possibly comprising thousands of species. These contemporary collections mostly involve primary (or duplicate) voucher specimens used in marine natural product “bioactive” sponge surveys, largely funded by the US National Cancer Institute (NCI), undertaken by several independent groups of chemical researchers (e.g. Australian Institute of Marine Science, Townsville (AIMS); Coral Reef Research Foundation, Chuuk State and Palau (CRRF); Scripps Institute, San Diego; University of Southern California, Santa Cruz; Cancer Research Institute, Arizona State University; and others).
Zoological Reference Collections (Raffles Museum), National University of Singapore (ZRC): small collections of approximately 200 species mainly from the Singapore and northwest Indonesian islands.

Phuket Marine Biological Station, Thailand (PMBS): small collections of approximately 100 species from the Andaman Sea, Gulf of Thailand and Malay peninsula.

Pacific Institute of Bio-organic Chemistry, Vladivostok (PIBOC): moderately large collections of several hundreds of species from Vietnam and northern part of the South China Sea made by the RV Akademik Oparin and other expeditions during the late 1980s and early 1990s.


Institute of Oceanology, Academia Sinica, Qingdao, China (IOAS): collections of approximately 45 species from both shallow and deeper waters in the northern part of the South China Sea (these are appended, compiled independently by Li Jinhe).

Silliman University Marine Laboratory, Dumagette, Philippines: duplicates of collections made by various NCI expeditions comprising approximately 200 species.

Maritime Biology Museum, Oceanographic Institute of Nha Trang, Vietnam: small collection of approximately 100 specimens from waters of Vietnam and Cambodia, presently unidentified (Nguyen Huu Phung, personal communication).

University of Hong Kong: Small collection of approximately 30 species, some published by van Soest (1980) and Pulitzer-Finali (1980) in the proceedings of an international biological workshop on the Hong Kong fauna.

NOTES ON THE SPECIES LIST

The following regions were included in the literature and database searches (annotated 1-7 for each species). Broad regions are: 1 = Cocos, Nicobar and Andaman Islands, Andaman Sea, islands and coast of Burma and western Thailand; 2 = western Malay Peninsula, Singapore, Straits of Malacca, northern Sumatra, northern Java; 3 = Gulf of Thailand, east coast of Thailand, Cambodia, Vietnam, including Paracels Archipelago, Spratly Is., Macclesfield, Atoll de Tizard; 4 = Borneo, Sarawak, Sabah, Brunei; 5 = southern coast of China including Hong Kong; 6 = southeastern Indonesian archipelago; 7 = Philippines, Palawan.

Apart from collections made personally by the author all other species records cited here are taken from the literature and from several computer databases. In many cases no judgement was possible as to their “absolutely correct” generic assignment, or the possibility that they might be junior synonyms of other species (or misidentifications). Very few reliable revisions of this fauna have yet been made, but the species list does provide an indication of the relatively high biodiversity of sponges, and diversity of biological habitats in this region.
Only the major taxonomic works dealing exclusively or mainly with this region have been checked and provided with annotations about localities etc. There are many other species records of sponges from the Indonesian archipelago scattered throughout the vast and mostly antiquated sponge literature. Fortunately, these have already been compiled in a computer database (indicated as ZMA database, Zoological Museum of Amsterdam, The Netherlands). Due to constraints of time most of these isolated records have not been checked from original sources, hence only a general regional locality is provided. This database also includes “preliminary identifications” made by Maurice Burton of the huge Siboga expedition sponge collections (1899-1900), still largely unpublished, with many unpublished (manuscript) species names (indicated as species names in quotes). These records are annotated as Burton MS. Personal collections made by the senior author from southwestern Philippines, Thailand, Malaysian and Cambodian regions (1989-1991), housed in the Queensland Museum Brisbane and Northern Territory Museum Darwin, are annotated QM collection and NTM collection, respectively. Small collections, primarily made for marine natural products chemistry studies, are housed in the Zoological Reference Collection, National University of Singapore (ZRC).

KEY TO CLASSES AND ORDERS

1. Mineral skeleton composed of calcitic spicules ........................................... [Class Calcarea] ....... (2)
   - Mineral skeleton composed of six-rayed silica spicules, occurring both individually and fused together .......................................................... [Class Hexactinellida] ....... (5)
   - Mineral skeleton composed of silica spicules and/or spongin fibres ........................................ [Class Demospongiae] ....... (7)

2. With at least some free triradiate spicules ........................................ [Subclass Calcinea] ....... (3)
   - Spicules are free and sagittal tetracts and monaxoniform ones .......... [Subclass Calcaronea] ....... (4)
   - Most spicules are fused (“hypercalcified”), often with tuning fork spicules included (polyphyletic characters) ......... [Orders Murrayonida (Calcinea) and Lithonida (Calcaronea)]

3. Spicules may include triradiate and quadriradiate forms periphery of skeleton has a distinct cortex. ........................................ [Order Clathrinida, family Leucetidae]
   - Only triradiate spicules present, body plan asconoid ........................................ [Order Clathrinida, other families]

4. Body plan asconoid .................[Order Leucosoleniida, family Leucosoleniidae]
   - Body plan syconoid or leucosold .................[Order Leucosoleniida, other families]

5. Biotrulate microscleres present, hexaster microscleres absent, sponges not attached to substrate but embedded within it on 1 or more long basal spicules ...................................................... [Subclass Amphidiscophora, Order Amphidiscosida]
   - Hexaster microscleres present, biotrulate microscleres absent, sponges usually fixed to substrate ...................................................... [Subclass Hexasterophora] ....... (6)

6. Parenchymal skeleton consists of fused hexactine spicules forming rigid skeleton .................. [Order Hexactinosida]
   - Parenchymal spicules are lychnises united together, with centre of each spicule surrounded by 12 struts .............................................................. [Order Lychniscosida]
   - Parenchymal spicules consist of hexactines usually free within syncytial (acellular) matrix, and with specialized ecosomal hexactines or pentactines with longest ray pointing inwards .... [Order Lyssacinosida]

7. Skeleton composed of tetraaxonid spicules and derivatives with equal rays, megascleres and microscleres undifferentiated, (sometimes spicules are lost completely and sponge may be superficially confused with compound ascidians) .............................................................. [Subclass Homoscleromorpha, Order Homosclerophorida]
- Tetragonid and monaxonid megascleres often occur together, asterose microscleres common, skeleton is usually radial or axially compressed. [Subclass Tetractinomorpha] (8)
- Monaxonid megascleres, with a diversity of microscleres but never asterose forms, (two order lacking free spicules altogether) [Subclass Peraxinomorpha] (9)

8. Spherical growth form usual, radial pattern of triaenes and oxees, microscleres signaspires ...

- Large oxees always present, sometimes with triaenes, radial at surface only, microscleres asterose forms [Order Astrophyrida]
- Monaxonid spicules only (styles, oxees, never tetractinal forms), radial at least at surface, microscleres may be absent or may include asterose and monaxonid forms (microoxees, spirasters) [Order Hadromerida]
- Articulated siliceous desma megascleres, with or without free spicules [Order Lithistida (polyphyletic)]

9. With siliceous megascleres and/or microscleres, with spongin fibres (10)
- Without free spicules, with spongin fibres (11)

10. Microscleres include chelae and other diverse forms, megascleres often localized to distinct regions (e.g. inside fibres), sand/detritus may replace megascleres completely...

- Microscleres typically absent, with main skeleton composed of criss-cross (family Halichondridae) of monaxonid megascleres (styles, oxees, strongyles), usually with more organization at surface, or sometimes condensed into an axial skeleton and a plumose or plume-recticulate extra-axial skeleton (family Axinellidae), or plumose-dendritic mineral skeleton (family Dictyonellidae), fibre system poorly developed or absent [Order Halichondrida]
- Microscleres may be absent or include centriangular sigmas, toxas or microoxees, megascleres diactinal usually producing well-formed structure (e.g. isodictyal-recticulate)...

11. Lacking mineral skeleton completely (although detritus and contaminating spicules often occur, confusing these with poecilosclerids), with well developed relatively homogeneous spongin fibres forming reticulate skeleton, typically with 2 or 3 different sized networks, consistency not collagenous [Order Dictyoceratida]
- Spongin fibres forming reticulate skeleton, with laminated spongin fibres, with distinct pith of fine fibrils, forming reticulate skeleton without differentiation of primary and secondary elements, collagenous consistency, frequently with a live yellow colouration which darkens in contact with the air [Order Verongida]
- With strongly lamellated spongin fibres forming dendritic skeleton arising from basal attachment [Order Dendroceratida]
- Without free spicules but with a solid aragonitic cortex producing a series of chambers on top of each other, the youngest (uppermost) chambers lined with living tissue...

SYSTEMATIC CHECKLIST OF SPONGES

Phylum Porifera
Subphylum Cellularia
Class Demospongiae

Definition. - Sponges with the skeleton composed of spongin fibres alone or together with siliceous spicules (although some “relict sclerosponge” forms have both a basal calcitic skeleton as well as free siliceous spicules). Some groups lack a mineral skeleton entirely
(some Homoscleromorpha and others). Collagenous filaments or fibrils (forming the ground substance of the intercellular mesohyl) are ubiquitous, spongins fibres (also composed of collagen) occur in most families, and histological organisation is always cellular (as opposed to syncytial in the Hexactinellida). Choanocytes occupy chambers that are spherical, hemispherical, elongate or branched.

Remarks. - Three subclasses of Demospongiae are distinguished on the basis of larval morphology and life cycle strategy (Homoscleromorpha, Tetractinomorpha, Ceractinomorpha), and a fourth (polyphyletic) group, the “sclerosponges” with calcified basal skeletons, is now distributed amongst the existing various families of demosponges. The “sphincozoa” are also now included in Demospongiae, subclass Ceractinomorpha. There are 13 orders (1 dubious), 71 families and 1005 nominal genera included, although only 507 genera are presently considered to be valid. 481 genera include marine species and 26 genera concern freshwater species (the latter not included in this work).

Demospongiae contain about 95% of living species, with a described fauna already consisting of about 4500-5000 species and an estimated total extant fauna of between 14000-15000 species worldwide.

Subclass Homoscleromorpha

Definition. - Demospongiae with secondarily derived amphiblastula larvae and viviparous reproduction: skeleton composed of tetraxonid siliceous spicules and derivatives with equal rays (diods, triods, lophate spicules), arranged around choanocyte chambers reflecting the canal structure; no differentiation between megascleres and microscleres although size differences do occur between types of spicules; spicules usually small (100μm or less), not localised to any particular region; choanocyte chambers with large numbers of choanocytes. One order, one family.

Order Homosclerophorida

Definition. - As for subclass.

Family Plakinidae Schulze, 1880

Definition. - Encrusting or massive growth forms; simple body structure with aquiferous system varying from simple asconoid construction to more complex folding and elaborate canal systems; mineral skeleton composed of relatively small calthrops and/or derivatives (diods or triods), often with branched ends (lophotetactines), generally arranged uniformly within sponge; spicules usually surround aquiferous system in regular “alveolar” arrangement; siliceous spicules and spongins fibres absent in one genus (Oscarella), having only collagenous fibrillar spongins in mesohyl; choanocyte chambers with 300-500 choanocytes, usually euryalous, occasionally aphodal; larvae unique amphiblastula type.

SOUTH CHINA SEA SPECIES.

*Astroplakina stelligera* Dendy and Burton, 1927:231, fig.2 (W of Mergui Archipelago, 12° N. 130m) (1)

*Oscarella lobularis* Schmidt, 1862 (Indonesia, ZMA database) (6)
Subclass Tetractinomorpha

**Definition.** - Demospongiae with parenchymellae or creeping blastula larvae, predominantly oviparous reproduction although in some genera young sponges are incubated within parent and set free as small adults; megascleres tetraxonid and monaxonid, occurring together or separately; microscleres asterose forms and derivatives; skeletal structure usually radial or axially compressed.

**Remarks.** - Three orders of Tetractinomorpha are well established (Astrophorida (also known as Choristida), Hadromerida, and Spirophorida), and a fourth polyphyletic order (“Lithistida”) shows major affinities to, and will probably be merged eventually in, Hadromerida.

Order Spirophorida

**Definition.** - Typically with spherical growth form, with tetraxonid and monaxonid megascleres (triaenes, oxeaes), in radiate pattern; protariaenes most common and often protrude from surface; monopodial desmas may be present; microscleres contorted microspined sigmaspires (an apomorphy for the group); reproduction oviparous without a larval stage, or viviparous with production of young adults within parent. Two families included, one with “lithistid” grade of construction.

Family Tetillidae Sollas, 1886

**Definition.** - Sponges with a perfect radial skeleton and consequent near spherical form, often referred to as ‘golf ball sponges’: megascleres triaenes and oxeaes arranged in radiate pattern; protariaenes apomorphic for the family, often protruding from the surface; microscleres contorted sigmaspires with minute spines; sometimes other modified triaene spicules also present (amphicladis, calthrops-like); inhalant pores grouped in special pore areas in some genera (poriferous pits or porocalices), unique to the family; reproductive patterns range from extrusion of fertilized eggs (which are fixed to the substrate and develop directly), to oviparous (with incubation of complete young sponges which are then expelled by localised breakdown of the pinacoderm); no free larvae yet described.

**SOUTH CHINA SEA SPECIES.**

*Crurisporha bedoti* (Topsent, 1897); Desqueyroux-Faunudez, 1981 (Ambon, Indonesia) (6)
*Plakortis* sp.; Dawydoff, 1952 (Vietnam, Cambodia) (3)
*Plakortis* "clathrata" Burton, unpublished MS name (Indonesia, ZMA database) (6, Burton MS).
*Plakortis* cf. *corticoides* Vacelet, Vasseur & Lévi, 1976 (Indonesia, ZMA database) (6)
*Plakortis* (*Dercitus*) *mannillaris* (Lendenfeld, 1906) (SW, Cebu, Philippines) (7, QM/NTM collection)
*Plakortis nigra* Lévi, 1961 (Sulawesi, Indonesia) (6, QM/NTM collection)
*Plakortis* *simplex* (Schulze, 1880); Dawydoff, 1952 (Vietnam; Indonesia, ZMA database) (3,6)
*Plakortis* cf. *triloba* Schulze, 1880 (Indonesia, ZMA database) (6)
*Plakortis* n.sp. (Indonesia, ZMA database) (6)
Hooper et al.: Sponges of the South China Sea

Cinachyra barbata Sollas, 1888; Dawydoff, 1952 (Poulo Condore, Phuquoc, Vietnam) (3)
Cinachyra cavernosa. (Lamarche); Burton & Rao, 1932; Pattanayak, 1997 (Nicobar and Andaman Islands) (1)
Cinachyra macellata (Sollas, 1888) (off Manila) (7)
Cinachyra malaccensis Sollas, 1902:219, pl.14, fig.2, pl.15, fig.5 (Pulau Bidang, NE of Penag, 5°30’S) (2)
Cinachyra simplex (Sollas, 1888); Burton & Rao, 1932:326 (off Cape Negrais, Burma, 15°50’N) (1)
Cinachyra voeltzkowi Lendenfeld, 1899; Dragniewitsch, 1906:440 (Singapore, 1°30’N) (2)
Cinachyra sp.; George & George, 1987 (Bodgaya Islands and Pulau Sipadan, Sabah) (4)
Cinachyra sp. (Indonesia, ZMA database) (6)
Cinachyra spp. (Singapore; QM/ZRC collections) (2)
Cinachyra sp (Nha Trang, Vietnam, PIBOC database) (3)
Cinachyrella clavigera (Hentschel, 1912:327); Wilson, 1925:365 (Philippines) (7)
Cinachyrella crastata (Wilson, 1925:367) (Philippines) (7)
Cinachyrella hirsuta (Dendy, 1889); Wilson, 1925:363 (Philippines) (7)
Cinachyrella paterifera (Wilson, 1925:375) (Philippines) (7)
Cranifilla carteri Sollas, 1888 (Indonesia, ZMA database) (6)
Cranifilla simillima (Bowerbank); Wilson, 1925:378 (Philippines) (7)
Cranifilla sp (Nha Trang, Vietnam, PIBOC database) (3)
Cranifilla sp.nov.; Dawydoff, 1952 (Vietnam, Cambodia) (3)
Paratettilla arcifera Wilson, 1925:380 (Philippines) (7)
Paratettilla baezaa (Selenka, 1867); Lindgren, 1897: 485; Lindgren, 1898 (Gaspard Straits, Java Sea): Burton & Rao, 1932:325; Pattanayak, 1997 (Marble Rocks, Mergui Archipelago; Port Blair, Andaman Is, 11°50’S; Nicobar and Andaman Islands; Indonesia, ZMA database) (1,2,6)
Samus anonymus Gray, 1867; Sollas, 1902:218 (Pulau Bidang, NE of Penang, 5°30’S) (2)
Tetilla ciliata Wilson, 1925:360 (Philippines) (7)
Tetilla crenatum (Mueller, 1789); Burton & Rao, 1932:326; Pattanayak, 1997 (Invisible Bank, Andaman Is, 11°50’S; off Cape Negrais, Burma, 15°50’S; Nicobar and Andaman Islands) (1)
Tetilla dactyloidea (Carter, 1869); Carter, 1887:79; Burton & Rao, 1932:326; Pattanayak, 1997 (Port Blair, Andaman Is, 11°50’S; Nicobar and Andaman Islands; King L., Mergui Archipelago, Burma, 12°08’N) (1)
Tetilla eosi Brándose, 1934 (Java, Banda, Indonesia) (6)
Tetilla (Donatia) japonica (Sollas, 1888); Dawydoff, 1952 (Gulf of Tonkin, Cape Saint-Jacques, Vietnam, Indonesia, ZMA database) (3,6)
Tetilla pediferia Sollas, 1888 (Indonesia, ZMA database) (6)
Tetilla ridleyi Sollas, 1888; Sollas, 1902:218 (Pulau Bidang, NE of Penang, 5°30’S) (2)
Tetilla spinosa. Wilson. 1925:361 (Philippines, Indonesia, ZMA database) (6,7)
Tetilla ternatae Kieschnick; Lindgren, 1897: 485; Lindgren, 1898 (Java) (2)
Tetilla zetlandica Carter, 1886 (Indonesia, ZMA database) (6)
Tetilla spp. (Nha Trang, Vietnam, PIBOC database) (3)
Tetilla (‘Chrotella’) sp.nov.; Dawydoff, 1952 (Vietnam, Cambodia) (3)

Family Scleritodermidae Sollas, 1888

Definition. - Bowl, cup-shaped or plate-like growth forms; fused “lithistid” skeleton composed of monocrepidial desmas (rhizoclones) and free spicules with slender oxeara distributed in tracts within choanosome, sometimes protruding through surface; triaenes absent, presumed secondarily lost; specialised ectosomal skeleton composed of contorted sigmaspires and special ectosomal desmas, also dispersed throughout sponge, sometimes together with minutely spined microstrongyles.

SOUTH CHINA SEA SPECIES.
Aciculites cf. ciliata Wilson, 1925:463 (Philippines, Indonesia, ZMA database) (6,7)
Aciculites cf. papillata Lévi & Lévi, 1983 (Philippines, Indonesia) (6,7)
Aciculites tulearensis Vacelet & Vasseur, 1965 (Indonesia, ZMA database) (6)
Aciculites sp. (Indonesia, ZMA database) (6)
Amphiblepta (‘Taprobane’) herdmanni (Dendy, 1905:103); Wilson, 1925:468; Burton, 1928:110 (W of Mergui Archipelago, 13° 04′ N, 130m; Philippines; Indonesia, ZMA database) (1,6,7)

Amphiblepta stoneae (Lévi & Lévi, 1983) (Philippines; Indonesia) (6,7)

Scleritodermia flabelliformis Sollas, 1888 (Indonesia, ZMA database) (6)

Scleritodermia nodosum Thiele, 1900 (Indonesia, ZMA database) (6)

**Order Astrophyorida**

**Definition.** - Typically with asterose microscleres (but sometimes lost), microxeas and microrhabds; with tetractinal megascleres, usually triaenes, calthrops, or short-shafted triaenes, together with oxeas; with radial skeletal architecture obvious at least at surface; reproduction oviparous although gametes so far described for very few species; larval stages not yet known. Seven families presently included.

**Family Ancorinidae Schmidt, 1870**

**Definition.** - Growth forms either encrusting to massive, or more specialised with spherical body and long inhalant and exhalant tubes at opposite ends (the latter with stellate, spicular, funnel-shaped end); megascleres long-shafted triaenes (with shaft directed inwards and clads on surface) and oxea megascleres; microscleres euasters and microrhabds, without stellasters or amphiarasters.

**SOUTH CHINA SEA SPECIES.**

**Ancorina simplex** (Lendelev, 1899): Dragnewitsch, 1906:441 (Singapore) (2)

**Ancorina sp.** 941; Sattahip region, Thailand (3, QM/NTM collection)

**Asteroptria simplex** Carter, 1879:349; van Soest, 1980 (Hong Kong, Philippines) (5,7)

**Asteroptria sp.** (Singapore; ZRC) (2)

**Disyringa dissimilis** Ridley, 1884 (Indonesia, ZMA database) (6)

**Disyringa nodosa** Hentschel, 1912 (Aru Is, Indonesia) (6)

**Ecitonemia acervus** (Bowerbank, 1862); Burton & Rao, 1932; Pattanayak, 1997 (Nicobar and Andaman Islands; Indonesia, ZMA database) (1,6)

**Ecitonemia agglutinans** Thiele, 1899 (Indonesia, ZMA database) (6)

**Ecitonemia baculifera** (Carter, 1887:78) (King I, Mergui Archipelago, Burma, 12° 08′ N); Lindgren, 1897: 485; Lindgren, 1898; Burton, 1937:7; Lévi, 1961:510 (Zamboanga, Philippines; Java, Indonesia) (1,2,7)

**Ecitonemia carteri** Dendy, 1905: Burton & Rao, 1932:318 (Nankauri, Nicobar Is, 7° 57′ N; Andaman Is) (1)

**Ecitonemia contolosa** Kieschnick, 1896 (Ternate, Moluccas, Indonesia) (6)

**Ecitonemia cribrosa** Thiele: Wilson, 1925:24 (Ternate, Moluccas, Indonesia; Philippines) (6,7)

**Holovea collectix** Thiele, 1900 (Indonesia, ZMA database) (6)

**Holovea valida** Thiele, 1900 (Indonesia, ZMA database) (6)

**Melophilus (‘Asteroptrus’) savariniorum** (Thiele, 1899); George & George, 1987 (Bodgaya Islands and Pulau Sipadan, Sabah: Banda Sea; Bohol Sea; Philippines) (4,6,7, QM/NTM collection)

*Myriastra clavosa* (Ridley, 1884); Lindgren, 1897: 485; Lindgren, 1898; Wilson, 1925:287; Dendy and Burton, 1927:246; Burton & Rao, 1932:311; Brondeest, 1934 (off Cinque I., Andaman Is, 11° 20′ N, 140-240m; Tana Mura Besar, Singapore I., 1° 25′ N; Kabusa I., Mergui Archipelago, 12°N; Andaman Is; Vietnam, China Sea, 11° 5′ N, Mansfield I., Indonesia; Philippines) (1,2,3,6,7)

*Myriastra clavosa* (Dendy & Burton, 1926); Burton & Rao, 1932; Pattanayak, 1997 (Nicobar and Andaman Islands) (1) [perhaps junior homonym of Ridley, 1884 species]

**Myriastra (‘Stelletta’) parpurea** (Ridley, 1884); Burton & Rao, 1932; Pattanayak, 1997 (Camorta I., Nicobar Is, 8° 5′ N; ENE of Preparis I., Bay of Bengal, Burma, 15° N; Indonesia, ZMA database; Andaman Islands) (1,6)

**Myriastra siemensi** Wilson, 1925:291 (Philippines) (7)

**Myriastra sp. nov.**; Dawydoff, 1952 (Vietnam, Cambodia) (3)
Hooper et al.: Sponges of the South China Sea

*Penes dendo* (Hentschel, 1912) (Indonesia) (6)

*Penes "dirhabdosa"* Burton, unpublished MS name (Indonesia, ZMA database) (6, Burton MS)

*Penes schulzei* Thiele, 1899 (Indonesia, ZMA database) (6, Burton MS)

*Penes sullasi* Thiele, 1900 (Indonesia, ZMA database) (6)

*Penes sp.*; Pinder, 1992 (South China Sea) (5)

*Rhabastrella ("Diastra") sternastrae* (Row., 1911) (Indonesia, ZMA database) (6, Burton MS)

*Rhabastrella ("Aurora", "Stelleta") globostellata* (Carter, 1883); Dragnewitsch, 1906:440; Burton & Rao, 1932:317; Pattanayak, 1997 (Singapore; Aberdeen Reef, Andaman Is., 12°N, Nicobar and Andaman Islands; Indonesia, ZMA database) (1,2,6)

*Stelleta arauensis* Hentschel, 1912 (Aru I., Indonesia) (6)

*Stelleta aspera* Kieschnick, 1896 (Ternate, Moluccas, Indonesia) (6)

*Stelleta brevidens* Topsent, 1897; Desqueyroux-Taudez, 1981 (Ambon, Indonesia) (6)

*Stelleta brevis* Hentschel, 1912 (Aru I., Indonesia) (6)

*Stelleta brunnnea* Thiele, 1900 (Indonesia) (6)

*Stelleta caverresa* (Dendy, 1916); Burton & Rao, 1932:311; Pattanayak, 1997 (Nicobar Is.; Nicobar and Andaman Islands; Indonesia, ZMA database) (1,6)

*Stelleta clavata* Ridley, 1884; Dawydoff, 1952 (Vietnam, Cambodia) (3)

*Stelleta crassispicula* Sollas, 1888 (Indonesia, ZMA database) (6)

*Stelleta debilis* Thiele, 1900 (Indonesia, ZMA database) (6)

*Stelleta haeckelii* (Sollas, 1888); Dendy & Burton, 1927:246; Pattanayak, 1997 (8 mts W of Interview 1, Andaman Is., 13°30'N, 90:540m; Nicobar and Andaman Islands) (1)

*Stelleta herdmani* Dendy, 1905 (Indonesia, ZMA database) (6)

*Stelleta japonica* (Lebwohl, 1914) (Indonesia, ZMA database) (6, Burton MS)

*Stelleta longicladus* Dendy & Burton, 1929 (Indonesia, ZMA database) (6, Burton MS)

*Stelleta mauritiana* Dendy, 1916 (Indonesia, ZMA database) (6)

*Stelleta maxima* Thiele, 1898 (Indonesia, ZMA database) (6)

*Stelleta orientalis* Thiele, 1898; Burton and Rao, 1932:311 (Andaman Is., shallow water) (1)

*Stelleta plagioeucta* Lévi, 1961:512 (Zambanga, Philippines) (7)

*Stelleta porosa* Kieschnick, 1896 (Ternate, Moluccas, Indonesia) (6)

*Stelleta radicifera* Wilson, 1925:294 (Philippines) (7)

*Stelleta reniformis* Kieschnick, 1896 (Ternate, Moluccas, Indonesia) (6)

*Stelleta simplicifurca* (Sollas); Lindgren, 1897:485; Lindgren, 1898; Dawydoff, 1952 (Vietnam, China Sea. 11°5'N, Amoy, China, Taiwan, N. China Sea) (3)

*Stelleta simplicissima* Sollas, 1888; Dawydoff, 1952 (Vietnam, Cambodia) (3)

*Stelleta sphaeroides* Kieschnick, 1896 (Ternate, Moluccas, Indonesia) (6)

*Stelleta stellifera* Kieschnick, 1896 (Ternate, Moluccas, Indonesia) (6)

*Stelleta subtilis* Sollas, 1888 (Indonesia, ZMA database) (6)

*Stelleta tenuis* Lindgren, 1897:485; Lindgren, 1898 (Java); Deng et al., 1992; Su et al., 1994, 1995a (South China Sea, Taiwan) (2,5)

*Stelleta tenuispica* Sollas, 1888 (Indonesia, ZMA database) (6)

*Stelleta ternatensis* Thiele, 1900 (Ternate, Moluccas, Indonesia) (6)

*Stelleta testudinaria* (Ridley, 1884) (6, Burton MS)

*Stelleta topsent* Thiele, 1903 (Indonesia, ZMA database) (6)

*Stelleta trichotriena* Dendy & Burton, 1927:241, fig.6; Pattanayak, 1997 (Andaman Is., 12°N, 540m; Nicobar and Andaman Islands) (1)

*Stelleta validissima* Thiele, 1900; Burton & Rao, 1932:310; Pattanayak, 1997 (Invisible Bank, Andaman Is., 11°30'N, Nicobar and Andaman Islands; Indonesia, ZMA database) (1,6)

*Stelleta variohama* Thiele, 1900 (Indonesia, ZMA database) (6)

*Stelleta spp.* ("reduced"); Burton & Rao, 1932:312 (Macpherson Straits near Chiriyatapur, Andaman Is., 11°25'N; Paway L., Mergui Archipelago, 11°30'N) (1)

*Stelleta sp.;* Cabrero, 1979:19 (Bohol, Philippines) (7)

*Stelleta spp.* (Indonesia, ZMA database) (6)

*Stelleta sp.* (Singapore; ZRCI) (2)

*Stelleta spp.* (Nha Trang, Vietnam, PIBOC database) (3)

*Stryphus sp.* nov.; Dawydoff, 1952 (Vietnam, Cambodia) (3)

*Tethyopsis colmanifer* Stewart, 1870 (Indonesia, ZMA database) (6)

*Tethyopsis dubia* Wilson, 1925:300 (Philippines) (7)

*Tethyopsis radiata* (Marshall, 1880) (Indonesia, ZMA database) (6, Burton MS)
Family Calthropellidae Lendenfeld, 1906

Definition. - Massive to subspherical growth forms; megascleres calthrops and oxeas, with rays of calthrops sometimes more than four or reduced to two, and three rays may be bifurcate; one genus (Chelotropella) with radially oriented dichotriaenes; microscleres usually euasters, usually spherasters, but sometimes others.

SOUTH CHINA SEA SPECIES.
Calthropella geodioides Topsent, 1897; Desqueyroux-Faundez, 1981 (Ambon, Indonesia) (6)
Pachastrissa sp. 975 (Ko Samui region, Thailand) (3, QM/NTM collection)
Pachastrissa ('Pachastrea') sp. nov.; Dawydoff, 1952 (Vietnam, Cambodia) (3)

Family Coppatiidae Topsent, 1898

Definition. - Encrusting to massive growth forms; megascleres only oxeas forming radial skeleton; triaenes absent; microscleres euasters (never sternasters), sometimes microxeas and sanidasters; genera related to stellettids but lack triaenes.

SOUTH CHINA SEA SPECIES.
Cryptotrema agglutinans Dendy, 1905 (Indonesia, ZMA database) (6) [incertae sedis]
Cryptotrema topsenti Thiele, 1900 (Indonesia, ZMA database) (6) [incertae sedis]
Jaspis (Doryplexeres) biangulata (Lindgren, 1897:483); Lindgren, 1898 (Java) (2,6)
Jaspis cf. coriacea Carter, 1886 (Indonesia, ZMA database) (6)
Jaspis distinctus Thiele, 1900 (Indonesia, ZMA database) (6)
Jaspis johnstonti (Schmidt, 1862) (Indonesia, ZMA database) (6, Burton MS)
Jaspis serpentina Wilson, 1925 (Philippines, Indonesia, ZMA database) (6,7)
Jaspis stellihera Carter, 1879; Dawydoff, 1952 (Vietnam; Indonesia, ZMA database) (3,6)
Jaspis sp.; Jung et al., 1995 (South China Sea) (5)
Jaspis sp. (Nha Trang, Vietnam, PIBOC database) (3)
Stellettinopsis sp. (Singapore; ZRC) (2)
Stellettinopsis sp. (Indonesia, ZMA database) (6)

Family Geodiidae Gray, 1867

Definition. - Thickly encrusting, massive to bowl-shaped growth forms; megascleres long shafted trienes and oxeas; sternaster microscleres always present forming superficial ectosomal crust, sometimes also with euasters, microrhabds and spherules.

SOUTH CHINA SEA SPECIES.
Cominpinus chinensis Lindgren, 1897: 485; Lindgren, 1898; Dawydoff, 1952 (Taiwan, China Sea; Vietnam) (3,5)
Erylis cornutus Wilson, 1925 (Philippines, Indonesia, ZMA database) (6,7)
Erylis decumbens Lindgren, 1897: 485; Lindgren, 1898 (Java) (2)
Erylis geodioides Burton & Rao, 1932:320, fig.5 (Mergui Archipelago, 130m; Indonesia, ZMA database) (1,6)
Erylis inaequalis Kieschnick, 1896 (Ternate, Moluccas, Indonesia) (6)
Erylis lendenfeldi (Sollas, 1888); Burton & Rao, 1932:320; Pattanayak, 1997 (Andaman Is, Nicobar and Andaman Islands; Indonesia, ZMA database) (1,6)
Erylis nobilis Thiele, 1900 (Indonesia, ZMA database) (6)
Erylis placenta (Gray); Dawydoff, 1952 (Vietnam, Cambodia) (3)
Geodia alba Kieschnick, 1896 (Ternate, Moluccas, Indonesia) (6)
Geodia alba Kieschnick minor Hentschel, 1912 (Aru Is, Indonesia) (6)
Geodia areolata Carter, 1880 (Indonesia, ZMA database) (6)
Family Pachastrellidae Carter, 1875

Definition. - Encrusting, massive and plate-shaped growth forms, with ostia and oscules on opposite sides; megascleres calthrops, short-shafted triaenes, and oxeas; microscleres streptasters of various types (metasters, spirasters and amphistasters), but never easter; desmas common in some genera (‘lithistid’ or ‘sublithistid’ grades of construction).

SOUTH CHINA SEA SPECIES,

Brachaster simplex Wilson, 1925:471 (Philippines) (7)
Characella abbreviata Wilson, 1925:284 (Philippines) (7)
Dercitus extensa Dendy, 1905 (Indonesia, ZMA database) (6)
Dercitus pauper Sollas, 1902:218, pl.15, fig.1 (Great Redang I., E coast of Malay Peninsula, 5° 50’N) (3)
Dercitus plicatus Topsent, 1895; Sollas, 1902:218 (Great Redang I., E coast of Malay Peninsula, 5° 50’N) (3)
Dercitus simplex (Carter, 1880); Burton & Rao, 1932:309 (Invisible Bank, Andaman Seas, 11° 30’N; Indonesia, ZMA database) (1,6)
Pachamphilla dendyi Hentschel, 1915; Thomas, 1977 (Andaman Sea, Indonesia) (1,6)
Pachastrella montifera Schmidt, 1868 (Indonesia, ZMA database) (6)
Pachastrella sp. (Indonesia, ZMA database) (6)
Poeckiastra ciliata Wilson, 1925:282 (Philippines) (7)
Poeckiastra compressa (Bowerbank, 1864); Dawydoff, 1952 (Vietnam, Cambodia) (3)
Poeckiastra eccentrica Dendy & Burton, 1927:238; Pattanayak, 1997 (between N and S Sentinel Is, Andaman Is, 11° 30’N, 440-480m; Nicobar and Andaman Islands) (1)
Poeckiastra lanimaris Sollas, 1888 (Indonesia, ZMA database) (6)
Poeckiastra saxicola Ridley, 1884; Dawydoff, 1952 (Vietnam, Cambodia) (3)
Poeckiastra tentulaminaris Sollas; Dendy & Burton, 1927:238; Burton and Rao, 1932:309; Pattanayak, 1997 (W of Mergui Archipelago, 12° 15’ N - 13° 04’ N, 120-130m; off Cape Negrais, Burma, 80-90m, 15° 57’ N; Mergui Archipelago, 130m; Interview L., Andaman Is, 13°N, 90-540m; Table L., Cocos Group, and West L. Andaman Is, 20m, 15° 35’ N; Nicobar and Andaman Islands; Indonesia, ZMA database) (1,6, Burton MS)
Poecillastra spp.; Jung et al., 1995 (South China Sea) (5)
Poecillastra spp. (Indonesia, ZMA database) (6)
Vulcanella (‘Sphinctrella’) bifacialis (Wilson, 1925;280) (Phillippines) (7)
Vulcanella (‘Sphinctrella’) sp. (Indonesia, ZMA database) (6)

Family Theneidae Sollas, 1886

**Definition.** - Mushroom shaped, more-or-less symmetrical sponges, with root-like bases forming masses of tangled spicules; one or more oscules may be present, and specialized pore areas as well as scattered pores distributed over entire surface; oscules and pore areas may or may not be fringed by projecting spicules; megascleres long-shafted trienes (pro-, dicho- and anatriaenes), oxas and ootylyote megasclices; microscleres streptasters (plesi-, met-, spir- and amphasters), but never euasters; asexually produced buds formed by some species.

**SOUTH CHINA SEA SPECIES.**
Thenea andamanensis Dendy & Burton, 1927;235, pl.3, fig.1, text-fig.4; Pattanayak, 1997 (Andaman Sea, 13° 15’N, 990m; Nicobar and Andaman Islands) (1)
Thenea grati Sollas, 1888: Wilson, 1925 (Indonesia, ZMA database) (6)
Thenea nesttntarla Lendenfeld, 1907 (N. Sumatra) (2)
Thenea rttLtrictLlrr (Bowelbank, 1861); Dawydoff, 1952 (Vietnam, Cambodia) (3)
Thenea nicobarensis Lendenfeld, 1907 (N. Sumatra) (2)
Thenea wyvillei Sollas, 1888; Dawydoff, 1952 (Paracels, Vietnam) (3)

Family Thrombidae Sollas, 1888

**Definition.** - Massive sponges with diplodal aquiferous systems; megascleres small, minutely spined triaenes (plagio-, dicho- and trichotriaenes with trifurcate clads), organised in ectosomal region with long shaft directed inwards and small clads tangential to surface, disorganised in choanosomal skeleton; microscleres amphasters.
[no recorded species]

Order Hadromerida

**Definition.** - Relatively cohesive order with uniform spiculation of monaxonid megasclices (monactinal or diactinal); with radially arranged skeleton always obvious at surface if not within choanosome; spongin fibres poorly developed (if at all present); ectosomal spicules typically smaller than choanosomal spicules, usually standing perpendicular to surface and protruding through ectosome; microscleres, if present, euasters, streptasters and derivatives, spirasters or spiraster-like spirules, or peculiar asterose-like discorbads; all groups oviparous (where known), with development of parenchymella larva (in one case blastula larva) directly in seawater. Twelve families presently included.

Family Chondrillidae Gray, 1872

**Definition.** - Encrusting to massive, liver-like or gelatinous sponges, often mistaken for compound ascidians; surface often smooth with marked cortex, enriched with fibrillar collagen; megasclices secondarily lost; euaster microsclices present or absent.
Definition. - Obligatory excavating or burrowing sponges in calcitic substrata; inhalant ectosomal pores (ostia) localized on papillae protruding through surface; terminal exhalant pores (oscules) on other papillae; megascleres tylostyles or subtylostyles; microscleres microspined oxeas and spirasters, both sometimes absent; following metamorphosis settled larvae burrow into calcareous substratum producing galleries, whereas faster-growing species may overgrow substratum completely, becoming massive, free-living sponges.
Family Hemiasterellidae Lendenfeld, 1889

Definition. - Encrusting, cup-shaped or branching sponges; megascleres styles, oxeas or both enclosed within compressed axial spongins fibres and plume to plume-rotate extraxial branches, or sometimes without a definite axis: microscleres euasters, smooth or partially microspined.

SOUTH CHINA SEA SPECIES.
Axos sp. (Indonesia, ZMA database) (6)
Hemiasterella complicata Topsent, 1919 (Indonesia, ZMA database) (6)
Hemiasterella intermedia Dendy, 1922 (Indonesia, ZMA database) (6)

Family Latrunculiidae Topsent, 1922

Definition. - Encrusting, massive, cylindrical to branched morphology, often with special oscula areas, oscules elevated on papillae, or pore sieve-plates lying on surface in deep furrows; megascleres styles, oxeas or strongyles, radial tracts at surface, with axial orientation in stalked forms and more confused tracts in choanosome of massive forms; microscleres peculiar discorhabds (bearing either two whorls of spines, two or three disks on a straight or spined axial rod, and with one swollen spined end, both ends spined, or both ends smooth), often aggregated into dense ectosomal crust (‘cortex’).

SOUTH CHINA SEA SPECIES.
Diacarnus megaspinorhabdos Kelly-Borges & Vacelet, 1995 (Batangas, Philippines) (7)
Diacarnus (‘Latruncula’) spiniplicatum (Carter, 1886) (Indonesia, ZMA database) (6)
Latruncula “debeaufortii” Burton, unpublished MS name (Indonesia, ZMA database) (6, Burton MS)
Latruncula globosa Vacelet, Vasseur & Lévi, 1976 (Indonesia, ZMA database) (6)
Latruncula laevis Lindgren, 1897: 484; Lindgren, 1898; Dwydoff, 1952 (Vietnam, China Sea, 11° 5’ N: Cambodia) (2,3)
Latruncula lendenfeldi (Lindgren, 1897) (Indonesia, ZMA database) (6)
Latruncula “loveni” Burton, unpublished MS name (Indonesia, ZMA database) (6, Burton MS)
Latruncula quadrilobata Dendy, 1922 (Indonesia, ZMA database) (6)
Latruncula sp.; Jung et al., 1995 (South China Sea) (5)
Latruncula sp. (Indonesia, ZMA database) (6)
Latruncula sp.; George & George, 1987 (Bodgaya Islands and Pulau Sipadan, Sabah) (4)
Negombata kenyensis (Pulitzer-Finali, 1982) (Puerto Princessa, Philippines) (7, QM/NTM collection)

Family Placopsongiidae Gray, 1867

Definition. - Encrusting to lobate-digitate growth forms; surface often with network of sculptured grooves or plates, often closable, into which ectosomal pores and oscules open; plate-like grooves on surface rendered hard by thick cortex of closely packed sertasters; single layer of upright tylostyles lies in the floor of each groove; megascleres tylostyles, also occurring in tracts within choanosomal skeleton; microscleres sertasters (spiraster-like) forming both dense surface crust and axial tracts; silica may be pigmented red.

SOUTH CHINA SEA SPECIES.
Placopsongia carinata Bowerbank, 1858; Lindgren, 1897: 485; Lindgren, 1898 (Gaspar Straits; Indonesia, ZMA database) (2,6)
Placopsongia melobesioide Gray, 1867;127; Lindgren, 1897: 485; Lindgren, 1898; Wilson, 1925;322; Dwydoff, 1952 (Gaspar Straits, Java Sea; Baie d’Along, Vietnam; Indonesia, ZMA database; Philippines) (2,3,6,7)
Placopsongia sp. (Singapore; ZRC) (2)
**Family Polymastiidae Gray, 1867**

**Definition.** - Massive, spherical or burrowing sponges, typically with oscular or blind fistules, papillae or plates on upper surface; megascleres usually tylostyles of subtylostyles, typically more than one size category, smaller forming erect surface brushes and larger radiating choanosomal bundles, with smaller spicules in poorly organised arrangement between columns; thin, smooth oxeas also occur in one genus; microscleres rare, if present, including only acanthose microxeas.

**SOUTH CHINA SEA SPECIES.**
- *Atergia* sp.; George & George, 1987 (photo 11) (Bodgaya Islands and Pulau Sipadan, Sabah) (4)
- *Polymastia gemmipara* Dendy, 1916 (Indonesia, ZMA database) (6)
- *Polymastia mamillata* Mueller; Dawydoff, 1952 (Vietnam, Cambodia) (3)
- *Polymastia* sp. (Indonesia, ZMA database) (6)
- *Polymastia* sp. (Singapore; QM/ZRC collections) (2)
- *Radiella* ("Trichostenma") *stricratulum* (Wilson, 1925:347) (Philippines) (7)

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**Family Spirastrellidae Ridley & Dendy, 1886**

**Definition.** - Growth forms include encrusting, facultative burrowing and excavating sponges, massive, or digitate growth forms, many with surface plates and sometimes with papillae protruding above surface; megascleres tylostyles; microscleres usually spirasters forming ectosomal crust.

**SOUTH CHINA SEA SPECIES.**
- *Spirastrella arenolata* Lindgren, 1897; Dawydoff, 1952 (Vietnam, Cambodia) (3)
- *Spirastrella aurivillii* Lindgren, 1897: 484; Lindgren, 1898; Dawydoff, 1952 (Gaspar Straits, Java Sea; Vietnam) (2,3)
- *Spirastrella carnea* Topsent, 1897; Desqueyroux-Faudrez, 1981 (Ambon, Indonesia) (6)
- *Spirastrella coccinea* Duchassaing & Michelotti; George & George, 1987 (Bodgaya Islands and Pulau Sipadan, Sabah) (4)
- *Spirastrella cunctatrix* Schmidt, 1868; Carter, 1887:75; Van Soest, 1980 (King L., Mergui Archipelago, Burma, 12° 08’N; Indonesia, ZMA database; Hong Kong) (1,5,6)
- *Spirastrella cuspidifera* (Lamarck, 1814) (Indonesia, ZMA database) (6)
- *Spirastrella decumbens* Ridley, 1884 (Indonesia, ZMA database) (6)
- *Spirastrella inconstans* (Dendy, 1887); Sollas, 1902:216, pl.14, fig.3; Lévi, 1961:513; Pattanayak, 1997 (Pulau Bidang, NE of Penang, 5° 30’N; Nicobar and Andaman Islands; Indonesia, ZMA database; Zamboanga, Philippines) (1,2,6,7)
- *Spirastrella lacunosa* Kieschnick, 1900; Dragnewitsch, 1906:441 (Singapore, 1° 30’N; Ternate, Moluccas, Indonesia) (2,6)
- *Spirastrella pachyspora* Lévi, 1958 (Indonesia, ZMA database) (6)
- *Spirastrella purpurea* Ridley, 1884 (Indonesia, ZMA database) (6)
- *Spirastrella purpurea* Ridley *glabrosa* Vosmer, 1911 (Indonesia, ZMA database) (6)
- *Spirastrella semilunaris* Lindgren, 1897: 484; Lindgren, 1898 (Java) (2)
- *Spirastrella solidia* Ridley & Dendy, 1886; Lindgren, 1897: 484; Lindgren, 1898; Dawydoff, 1952 (Gaspar Straits, Java Sea; Vietnam; Indonesia, ZMA database) (2,3,6)
- *Spirastrella spinicrufus* Kieschnick, 1900 (Ternate, Moluccas, Indonesia) (6)
- *Spirastrella spinispiralifera* Carter, 1879 (Indonesia, ZMA database) (6)
- *Spirastrella tristellata* Topsent, 1897; Desqueyroux-Faudrez, 1981 (Ambon, Indonesia) (6)
- *Spirastrella vagabunda* Ridley, 1884; Wison, 1925:343; de Laubenfels, 1935:334 (Puerta Galera, Philippines, Indonesia, ZMA database) (6,7)
- *Spirastrella cf. vagabunda* Ridley (Singapore; QM/ZRC collections) (2)
- *Spirastrella* sp. (Phuket region, Thailand) (1, QM/NTM collection)
- *Spirastrella* sp. 942 (Sattahip region, Thailand) (3, QM/NTM collection)

142
**Spirastrella** sp.: George & George, 1987 (Bodgaya Islands and Pulau Sipadan, Sabah) (4)
**Spirastrella** sp. 1024 (Bohol Sea, Philippines) (7, QM/NTM collection)
**Spirastrella** sp. 1034 (Bohol Sea, Philippines) (7, QM/NTM collection)
**Spirastrella** sp. 88 (Bohol Sea, Philippines) (7, QM/NTM collection)
**Spirastrella** sp. 1708 (Kalimantan, Indonesia) (6, QM/NTM collection)
**Spirastrella** sp. (Singapore; ZRC) (2)
**Spirastrella** sp. (Singapore; ZRC) (2)
**Spirastrella** sp. (Singapore; ZRC) (2)
**Spirastrella** sp. (Nha Trang, Vietnam, PIBOC database) (3)

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**Family Stylocordylidae Topsent, 1928**

**Definition.** - Deep water sponges with stalked, asymmetrical, globular or ovoid bodies, characteristically growing on soft substrates; megascleres include two sizes of oxoote spicules, long centrotyloste spicules and unusual, short, terminally curved spicules, together producing peculiar radial tracts converging towards stalk, and with spicules disposed along axis within stalk; microscleres absent or may include microxeas, microstrongylies or asters.

**SOUTH CHINA SEA SPECIES.**
*Stylocordyla borealis* Thompson, 1877 (Indonesia, ZMA database) (6)

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**Family Suberitidae Schmidt, 1870**

**Definition.** - Massive, pedunculate, bowl-shaped or encrusting sponges, generally without surface papillae; skeleton radial at surface, without a distinct cortex, but usually choanosome more disorganised, occasionally with loose axial organisation and nonradial in arrangement; megascleres typically tylostyles, subtylostyles, rarely styles or diactinial forms; tylostyles greatly modified in shape and position of head, being lobate, pear-shaped, drop-shaped or subterminal, or occasionally missing completely; microscleres, if present, may include spined centrotyloste rods; reproduction oviparous, with asexual buds or stolons also common.

**SOUTH CHINA SEA SPECIES.**
*Aaptos auptos* (Schmidt) nigra Lévi, 1961: 1310 (Vietnam) (3)
*Aaptos suberitoides* (Bröndsted, 1934) (Indonesia, ZMA database) (6)
*Aaptos* sp.; Do & Erickson, 1983 (Taiwan) (5)
*Aaptos* sp. (Singapore; ZRC) (2)
*Aaptos* spp. (Nha Trang, Vietnam, PIBOC database) (3)
*Laxosuberites proteus* Hentschel, 1909; Dawydoff, 1952 (Aru Is, Indonesia; Vietnam, Cambodia) (3)
*Laxosuberites* “styliferus” Burton, unpublished MS name (Indonesia, ZMA database) (6, Burton MS)
*Laxosuberites* sp. (Indonesia, ZMA database) (6)
*Poterion neptuni* Hardwick, 1849; Dawydoff, 1952 (Phu Quoc Is, Poulo Condore, Bassac, Gulf of Thailand; Indonesia, ZMA database) (3,6)
*Pseudesuberites andrewsi* Kirkpatrick, 1900 (Christmas L, Indonesia, ZMA database) (1,6)
*Pseudesuberites “canalis”* Burton, unpublished MS name (Indonesia, ZMA database) (6, Burton MS)
*Pseudesuberites cava* Sollas, 1902:217, pl.14, fig.6; Burton, 1928:133 (Pulau Bidang, NE of Penang, 5° 30’S; Bally Strait, Malay Archipelago) (1,2)
*Pseudesuberites* sp. (Indonesia, ZMA database) (6)
*Rhizasinella clavata* Thiele, 1899 (Indonesia, ZMA database) (6, Burton MS)
*Suberites carnosa* Johnston; Carter, 1887:74 (King L, Mergui Archipelago, Burma, 12° 08’N) (1)
*Suberites coronarius* Carter, 1882; Carter, 1887:74, pl.7, figs 4-5 (King L, Mergui Archipelago, Burma, 12° 08’N) (1)
*Suberites ct. domuncula*; Dawydoff, 1952 (Vietnam, Cambodia) (3)
*Suberites incrustans* Keller, 1891 (Indonesia, ZMA database) (6)
Suberites japonicus Thiele, 1899 (Indonesia, ZMA database); Dmitrenok et al., 1988 (Singapore) (2,6, Burton MS)

Suberites laxosubtertes Sollas, 1902:217, pl.15, fig.4 (Pulau Bidang, NE of Penang, 5° 30’N) (2)

Suberites lobulata Lévi, 1961: 132 (Vietnam) (3)

Suberites nuda (Wilson, 1925:352) (Philippines, Indonesia, ZMA database) (6,7)

Suberites perfectus Ridley & Dendy, 1886; Burton, 1928:132 (Bally Strait, Malay Archipelago, 320m) (2)

Suberites ‘ridlevi’ Burton, unpublished MS name (Indonesia, ZMA database) (6, Burton MS)

Suberites tenuicillus (Bowerbank, 1864); Dawydoff, 1952 (Vietnam, Cambodia) (3)

Suberites trincomaliensis Carter, 1887:74, pl.6, figs 7-8 (King I., Mergui Archipelago, Burma, 12° 08’N) (1)

Suberites sp. (Indonesia, ZMA database) (6)

Suberites sp. 953 Phuket region, Thailand (1, QM/NTM collection)

Suberites sp. 1033 (Negros Oriental, Zamboanga, Philippines) (7, QM/NTM collection)

Suberites sp. 327 (Negros Oriental, Philippines) (7, QM/NTM collection)

Suberites sp. 615 (W. Mindinao, Bohol Sea, Philippines) (7, QM/NTM collection)

Suberites sp. 1667 (Sumbawa, Indonesia) (6, QM/NTM collection)

Suberites spp. (Nha Trang, Vietnam, PIBOC database) (3)

Terpios crucatus Dendy, 1905 (Indonesia, ZMA database) (6)

Terpios fugu Duchassaing & Michelotti, 1864; Sollas, 1902:217 (Pulau Bidang, NE of Penang, 5° 30’N; Indonesia; ZMA database) (2,6)

Terpios zeteki (de Laubenfels, 1936) (Kalimantan, Indonesia) (6, QM/NTM collection)

Terpios sp. (Indonesia, ZMA database) (6)

Family Tethyidae Gray, 1867

Definition. - Typically spherical, less often encrusting or massive growth forms; upper surface often with polygonal plates and oscula-bearing grooves, and cribiform oscules occur at summit of sponge; basal surface often has root-like papillae; megascleres styles or strongyloxeas, latter with asymmetrical and/or telescoped ends; spicules not markedly tylote, frequently occurring in radial tracts; microscleres easter (including spherasters and micrasters); asexual reproduction by budding is common.

SOUTH CHINA SEA SPECIES.

Tethya (‘Donatia’) andamanensis (Dendy & Burton, 1926); Dendy & Burton, 1927:248; Pattanayak, 1997 (off Port Blair, Andaman Is, 11° 40’N, 220m; Nicobar and Andaman Islands) (1)

Tethya cf. aurantium (Pallas, 1766); Caberoy, 1979:18; Caberoy, 1981:26 (Tayabas Bay, Batangas, Quezon, Mindoro Oriental, Mindanaque La Union, Ilocos Sur, Ilocos Norte, Philippines) (7)

Tethya crinum Johnston, var. robusta Carter, 1887:79 (King I., Mergui Archipelago, Burma, 12° 08’N) (1)

Tethya (‘Donatia’) diloperda (Schmidt, 1870); Brondsted, 1934:5 (Banda, Indonesia); Pattanayak, 1997 (Nicobar and Andaman Islands) (1,6)

Tethya fissurata Lendenfeld, 1888 (Indonesia, ZMA database) (6, Burton MS)

Tethya ingalli (Bowerbank, 1866); Lindgren, 1897: 483; Lindgren, 1898; Sollas, 1902:215; Wilson, 1925:335; Dawydoff, 1952 (Vietnam, Cambodia; Great Redang I., E coast of Malay Peninsula, 5° 50’S; Java; Indonesia, ZMA database) (2,3,6)

Tethya japonica Sollas; Lindgren, 1897: 483; Lindgren, 1898; Dawydoff, 1952; Pulitzer-Finali, 1980 (Vietnam, Cambodia; Java; Hong Kong) (2,3,5)

Tethya (‘Donatia’) lanceolatum auctorum; Carter, 1887:77 (King I., Mergui Archipelago, Burma, 12° 08’N) (1)

Tethya maa Selenka, 1879; Sollas, 1902:216 (Pulau Bidang, NE of Penang, 5° 30’N) (2)

Tethya merguensis Carter, 1883:366, pl.15, figs 6-8; Carter, 1887:80 (King I., Mergui Archipelago, Burma, 12° 08’N) (1)

Tethya max Thiele, 1900 (Indonesia, ZMA database) (6)

Tethya (‘Donatia’; ‘Tethytinea’) repens (Schmidt, 1870); Dendy & Burton, 1927:247; Pattanayak, 1997 (Andaman Is, 12°N, 260-900m; Nicobar and Andaman Islands; Indonesia, ZMA database) (1,6)
**Family Timeidae Topsent, 1928**

**Definition.** - Encrusting growth form, rarely massive; surface often sculptured by stellate subectosomal drainage canals running to oscules, and characteristically with cortex of densely packed euctasters and single layer of erect tylostyles or tracts of tylostyles running to surface; megascleres exclusively tylostyles; microscleres include euctasters (including anthasters and lophasters) or pseudasters (amphiasters). *Diplastrella* has in addition a basal layer of large spherasters with branching rays.

**SOUTH CHINA SEA SPECIES.**

*Diplastrella spinoglobosa* Carter, 1879 (Indonesia, ZMA database) (6)

*Timea capitatostellifera* Carter, 1880 (Indonesia, ZMA database) (6)

*Timea granulata* Bergquist, 1965 (Indonesia, ZMA database) (6)

*Timea tetractis* Hentschel, 1912 (Aru Is, Indonesia) (6)

*Timea cf. anistellata* Topsent, 1900 (Indonesia, ZMA database) (6)

**Family Trachycladidae Hallmann, 1917**

**Definition.** - Massive or branching growth forms; oscules small (less than 1 mm in diameter); ostia scattered singly or grouped; skeleton condensed in axial region and plumoreticulate in extra-axial region, with ascending multispecific tracts joined at infrequent intervals by single spicules; skeletal tracts composed of spongin fibres enclosing intermixed oxaeas, strongyles and styles; microscleres smooth microstrongyles and spined vermiform spiraster-like spirules, rarely of more than two complete turns.

[no recorded species]

**“Order Lithistida”**

**Definition.** - A problematic, polyphyletic assemblage of sponges, abundant in the Cambrian-Quaternary period, with many Recent relatives (all retaining articulated siliceous desma spicules, producing rigid skeletal structure); desmas classified according to number of secondarily silicified rays (crepis), from one (monocrepial) to four (tetracrepial); many species also with secondary skeletons composed of free spicules indicating phylogenetic relationships (in this sense most orders of living sponges have desma-bearing representatives (living relicts ?); and possession of desmas is interpreted as a primitive feature); “lithistids” lacking free spicules are more difficult to assign to other demosponge orders, with desma morphology being the only current diagnostic character. Three suborders with nine families are presently retained in the taxon “Lithistida” awaiting further evidence as to their true affinities.
Suborder Triaenosina

**Definition.** - Peripheral skeleton of radially arranged triaene megascleres, with amphiaster, spiraster or microrhabd microscleres; with obvious affinities to Hadromerida.

**Family Corallistidae Sollas, 1888**

**Definition.** - Massive, fan-shaped, ridge-like and folded plate-like growth forms; rigid skeleton composed of tuberculate or arch-shaped monocrepidial desmas (dicranoclones); free megascleres phyllo-, disco- or dichotriaenes, together with oxeas or strongyles; microscleres streptoscleres (amphiasters, spirasters) or microxeas.

**SOUTH CHINA SEA SPECIES.**
*Callipelleta ornata* Sollas, 1888 (Indonesia, ZMA database) (6)
*Corallistes* sp. (Indonesia, ZMA database) (6)
*Corallistes* sp.nov.: Dawydoff, 1952 (Vietnam, Cambodia) (3)
*Macandrewia spinifoliata* Lévi & Lévi, 1983 (Philippines, Indonesia) (6,7)

**Family Pleromidae Sollas, 1888**

**Definition.** - Cylindrical, vase-shaped or plate-like growth forms; rigid skeleton composed of smooth arch-shaped or armless monocrepidial desmas (megaclones with terminal cupules); free megascleres in ectosomal skeleton dicho- or plagiotriaenes, together with oxeas (or strongyles in one genus); microscleres streptoscleres (amphiasters, spirasters) or microxeas.

**SOUTH CHINA SEA SPECIES.**
*Costifer vasiformis* Wilson, 1925:461 (Philippines) (7)
*Pleronta* sp. (Indonesia, ZMA database) (6)

**Family Theonellidae Lendenfeld, 1903**

**Definition.** - Massive, cup-shaped, vase-shaped or cylindrical sponges with a narrow central cavity; desma megascleres fused tetracloones (including tri- or tetracrepidial desmas having four arms that do not have triaenose symmetry); free megascleres include phyllo-, disco- or dichotriaenes; microscleres microxeas, microrhabds or microstrongyles, and streptoscleres (amphiasters or spirasters).

**SOUTH CHINA SEA SPECIES.**
*Discocerma claviformis* Kieschnick, 1896 (Ternate, Moluccas, Indonesia) (6)
*Discocerma emarginata* Dendy, 1905:99; Wilson, 1925:455 (Indonesia, ZMA database; Philippines) (6,7)
*Discocerma emarginata lanellaris* Wilson, 1925:456 (Philippines) (7)
*Discocerma gorgonoides* (Burton, 1928:109, fig.1); Pattanayak, 1997 (8 mls W of Interview L., Andaman Is, 12° 55'N, 90-540m; Nicobar and Andaman Islands) (1)
*Discocerma japonica* Doderlein, 1884; Burton & Rao, 1932:306 (off Cape Negrais, Burma, 15° 57'N) (1)
*Discocerma panoplia* Sollas, 1888 (Indonesia, ZMA database) (6)
*Discocerma papillata* (Carter, 1880); Burton & Rao, 1932:305; Pattanayak, 1997 (off Cape Negrais, Burma, 15° 57'N and Andaman Is; Nicobar and Andaman Islands) (1)
*Discocerma stylifera* (Keller, 1891) (Indonesia, ZMA database) (6, Burton MS)
Suborder Rhabdosina

**Definition.** - Ectosomal megascleres absent but ectosome contains minutely spined microstrongyles, microspined sigma-like microscleres or monocrepidial (one-rayed) disks; affinities with Hadromerida.

Family Cladopeltidae Sollas, 1888

**Definition.** - Solid, lobate sponges with tubular processes, each tube with an apical oscule; rigid ectosomal skeleton composed of special monocrepidial desmas, branching in one plane, lacking articulations (i.e. desmas without zygoses), whereas monocrepidial desmas in rigid choanosomal skeleton branch in all directions, articulating with adjacent desmas (i.e. with zygoses); free ectosomal megascleres oxytylote or oxystrongylotes, perpendicular to surface, or tangential to surface at ends of tubular processes; microscleres absent.

SOUTH CHINA SEA SPECIES.
*Siphonidiun capitatum* Sollas, 1888 (Indonesia, ZMA database) (6)

Family Neopeltidae Sollas, 1888

**Definition.** - Rounded, massive or papilliform sponges; ectosomal skeleton with monocredial disks; choanosome with monocrepidial desmas (dicranoclones), with or without free, slender oxees; microscleres microoxees and streptoscleres (amphiasters).

[no recorded species]

Suborder Anoplina

**Definition.** - Both ectosomal megascleres and microscleres absent; affinities uncertain.
Family Azoricidae Sollas, 1888

**Definition.** - Cup-shaped, club-shaped, spherical, plate-like or fan-shaped or conical growth forms; rigid skeleton composed of monocrepid desmas, and free skeleton with tracts of monoaxonid megascleres (styles or oxeas) in choanosome; special ectosomal skeleton absent; microscleres absent.

**SOUTH CHINA SEA SPECIES.**
- *Leidodermatium crassiusculum* Hentschel, 1912 (Aru Is, Indonesia) (6)
- *Leidodermatium deciduum* Schmidt, 1870; Lendenfeld, 1907 (N. Sumatra) (2)
- *Leidodermatium lyncus* Schmidt, 1870 (Indonesia, ZMA database) (6)
- *Leidodermatium (‘Azoria’) marginata* Sollas, 1888 (Indonesia, ZMA database) (6)
- *Leidodermatium (‘Azoria’) pfeifferae* Carter; Wilson, 1925:465; Burton, 1928:112; Burton & Rao, 1932:308 (Andaman Sea, 13° 16’N; W of Mergui Archipelago, 13° 04’N; Philippines) (1.7)

Family Desmanthidae Topsent, 1893

**Definition.** - Encrusting to massive growth forms; rigid skeleton with tetracrepidial desmas (tetraclones); free spicules consist of tracts of styles and tylostyles dispersed in choanosome; special ectosomal spicules absent; microscleres absent.

**SOUTH CHINA SEA SPECIES.**
- *Desmanthus topsenti* Hentschel, 1912 (Aru Is, Indonesia) (6)
- *Lophaconanthus rhabdophorus* Hentschel, 1912 (Aru Is, Indonesia) (6)

Family Vetulinidae Lendenfeld, 1903

**Definition.** - Folded, plate-like growth forms; rigid skeleton composed of acrepid (no rayed) desmas (sphaeroclones); free spicules strongylote megascleres scattered in choanosome; special ectosomal spicules absent; microscleres absent.

**SOUTH CHINA SEA SPECIES.**
- *Vetulina cf. stalactites* Schmidt, 1870 (Indonesia, ZMA database) (6)

Subclass Ceractinomorpha

**Definition.** - Sponges with parenchymella larvae and viviparous sexual reproduction (although with several oviparous ‘enclaves’: Agelasida, Petrosiidae, Axinellidae, Desmoxyidae, Raspailiidae (?)); generally with both spicule skeleton with well developed spongin fibres forming a diversity of skeletal structures (although siliceous spicules lost altogether in 3 orders, and spongin fibres lost in several genera); spicules monaxonic (either monactinal (styles) or diactinal (oxeas-strongyles)), never tetractinal (although modifications to the ends of some monaxonic spicules occur); microscleres diverse (meniscoid, oxeote, toxote, spheres) but never asterose.

**Remarks.** - Eight orders are differentiated here, although some authors also recognise a ninth (Petrosida), based on the possession of oviparous sexual reproductive strategy, now widely included in the Haplosclerida.
Order Verticillitida

Definition. - Demospongiae with ‘sphinctozoan’ grade of construction (solid aragonitic cortex producing a series of chambers on top of each other); living ‘sphinctozoans’ lack free spicules but have cells and larvae resembling those of other Demospongiae.

Remarks. - Only one extant order, family and genus (Vaseletia) are known, although many more fossil taxa described.

Family Cryptocoeliidae Steinmann, 1982

Definition. - Living ‘sphinctozoans’ with solid, cortical aragonitic skeleton consisting of a series of solitary or colonial chambers one on top of the other, with the lowest (oldest) chambers usually partially filled with secondary secretions of aragonite and youngest chambers containing living tissue (including a cuticle and cells such as flattened endopinacocytes and spherule-bearing cells); calcareous chambers contain reinforcement of radially disposed pillars; lining of atrial cavity uninterrupted (prosiphonate), with one chamber growing forward into base of next (younger) chamber, and with numerous thin struts (vesiculae) running from floor to roof of each chamber; struts joined by more or less horizontal crossbars; walls of chambers and atrial lining have trefoil or multifid perforations, with perforations corresponding to location of inhalant pores (ostia), whereas larger (oscular) openings are at apex of chambers with the passage of exhalant water via the atrium; choanocyte chambers apodal (with a small canal joining chamber to exhalant canal; larvae parenchymellae that develop from a coeloblastula. [no recorded species]

Order Agelasida

Definition. - Oviparous sponges, showing (perhaps superficial) resemblance to commercial bath sponges (Spongidae) and biochemical similarities to Axinellidae; growth forms branching, tubular, fan-shaped or massive; well developed spongin-fibre skeleton, forming regular or irregular reticulation; fibres echinated by short styles or oxeas with verticillate spines; microscleres absent.

Remarks. - Two recent families.

Family Agelasidae Verril, 1907

Definition. - Growth form ramose, lamellate, tubular or massive, often “honeycomb” reticulate in construction; colour frequently orange or red, texture extremely tough but compressible reflecting high ratio of spongin fibre to spicule; skeletal structure homogeneous, reticulate, with well developed system of large spongin fibres often containing no primary coring spicules but echinated by unique styles with verticillate spines (acanthoxeas or acanthostrongyles), with some species having geometrically different coring and echinating spicules, and others also having styles; sexual reproduction oviparous.
SOUTH CHINA SEA SPECIES.

Agelas ceylonica Dendy, 1922 (Indonesia, ZMA database) (6)
Agelas cf. “ceylonica” Van Soest, unpublished MS name (Indonesia, ZMA database) (6, Burton MS)
Agelas clathrodes: Pinder, 1992 (South China Sea) (5)
Agelas mauritiana Carter, 1883 (Indonesia, ZMA database) (6)
Agelas “primitiva” Burton, unpublished MS name (Indonesia, ZMA database) (6, Burton MS)
Agelas robusta Pulitzer-Finali, 1980 (Hong Kong) (5)
Agelas cf. schmidtii Wilson, 1925 (Philippines, Indonesia, ZMA database) (6,7)
Agelas spp. (Nha Trang, Vietnam, PIBOC database) (3)

Family Astroscleridae Lister, 1900

Definition. - Bulbous, encrusting or massive subspherical growth forms; basal skeleton composed of aragonite, spherulitic in form (with each spherulite laid down in a cell at the surface of the sponge and is eventually led to a position where it contributes to the general reticulate skeleton of aragonite); intracellular secretion of sclerodermites only found in Astrosclera, whereas in other genera the skeleton is secreted extracellularly; living tissue penetrates reticulation to a depth of about 1 cm, but no tabulae separate the tissue-filled external parts of the skeleton from the interior that is of free living tissue; interior interskeletal spaces generally fill in with secondary deposits of aragonite; siliceous spicules verticillately spined acanthostyles, sometimes secondarily lost.

SOUTH CHINA SEA SPECIES.
Astrosclera willeyana Lister, 1900 (Indonesia, ZMA database) (6)

Order Poecilosclerida

Definition. - Skeleton with discrete siliceous spicules, although some primitive groups retain a fused basal calcitic skeleton or a fused siliceous (desmoid) skeleton, along with free siliceous skeletons; main skeleton composed of megascleres (monactinal, diactinal or both) and spongin fibres in various stages of development; megascleres frequently localised to distinct regions; microscleres include meniscoid forms such as chelae (unique to the order) and sigmas, and other diverse forms (toxas, raphicles, microxeas); most families are viviparous, with uniformly ciliated parenchymellla having bare posterior poles (although Raspailiidae is probably oviparous).

Remarks. - This order contains more living species than all other Recent Porifera, and includes both marine and some freshwater species. Up to 25 families have been recognised in this order, most being typical in having chelae microscleres, several atypical in lacking these microscleres, but a recent proposed reorganisation of the order, based on phylogenetic parsimony analysis, suggests that only 19 of these may be valid.

Suborder Microcionina

Definition. - Poecilosclerida with terminally microspined ectosomal megascleres and up to 5 categories of structural megascleres, most frequently monactinal. Microscleres are palmate chelae, diverse toxas, but sigmas never present.
Family Iophonidae Burton, 1929

Definition. - Encrusting, massive, flabellate or digitate growth forms, sometimes burrowing and fistulose; ectosomal skeleton forming tangential tracts of tylostyles or strongyles with microspined bases; choanosomal styles form reticulate (in massive) or plumose skeletons (in encrusting growth forms); echinating spicules present or absent; microscleres include palmate isochelae and toxas (both sometimes lost), occasionally also with other microscleres such as bipocillae, modified anisochelae, microrhabds and raphides.

SOUTH CHINA SEA SPECIES.

*Actinurus berygquistae* van Soest, Hooper & Hiemstra, 1991; Topsent, 1897; Dawydoff, 1952; Desqueyroux-Faudon, 1981 (as ‘tortilis’) (Ambon, Indonesia; Vietnam) (3,6)

*Actinurus bitulattorii* (Hoshino, 1911); van Soest, Hooper & Hiemstra, 1991 (Borneobank; Banda Sea, Indonesia) (6)

*Actinurus elaudi* van Soest, Hooper & Hiemstra, 1991; Thiele, 1903 (as ‘ternatus’) (Ternate, Moluccas, Indonesia) (6)

*Actinurus primigenius* Hiemstra & Hooper, 1991 (Sumbawa, Indonesia) (6)

*Actinurus wolfgangii* Keller, 1889; Kieschnick, 1896; Thiele, 1903; van Soest, Hooper & Hiemstra, 1991 (as ‘ternatus’) (Ternate, Moluccas, Indonesia) (6)

*Corallium arcuata* Hentschel, 1912 (Aru Is, Indonesia) (6)

*Corallium dubium* Hentschel, 1912 (Aru Is, Indonesia) (6)

*Corallium strepsichaeta* Lévi, 1961 (Indonesia, ZMA database) (6)

*Damiria australiensis* Dendy; Lindgren, 1897: 482; Lindgren, 1898; Dawydoff, 1952 (Vietnam, China Sea, 11° 5’N) (3)

*Damiria simplex fistula* Hentschel, 1912 (Aru Is, Indonesia) (6)

*Ryta fuliginosa* (Carter, 1880) (Indonesia, ZMA database) (6)

*Ryta massalais* (Dendy, 1922) (Sulawesi, Indonesia) (6, QM/NTM collection)

Family Microcionidae Carter, 1875

Definition. - Encrusting, massive, lobate, fan-shaped and branching growth forms; ectosomal skeleton composed of styles or anisoxeas (exceptionally oxesas), in erect bundles, forming a continuous crust, lying tangential or sparsely dispersed on the surface; subectosomal skeleton relatively poorly developed; choanosomal skeleton with well developed spongin fibres forming hymedesmoid, microcionid, plumose, plumo-reticulate, reticulate or axially condensed tracts; spongin fibres cored by smooth or partially spined large styles, and echinated by smooth, wholly- or partially-spined small styles or modified forms (acanthoxeas or acanthostrongyles) embedded perpendicular to fibres; microscleres typically palmate isochelae, sometimes contort and thickened (pseudo-anchorate, -arcuate, or *Isodictya*-like isochelae), and also toxas and occasionally raphides or microxeas; sexual reproduction exclusively viviparous.

SOUTH CHINA SEA SPECIES.

*Antho* (*Ploscomania*) *ridleyi* (Hentschel, 1912); Hooper, 1996 (Aru I., SE Indonesia) (6)

*Antho* (*Ploscomania*) sp. 1707 (Kalimantan, Indonesia) (6, QM/NTM collection)

*Artemiisina* sp. (Nha Trang, Vietnam, PIBOC database) (3)

*Antho* spp. (Indonesia, ZMA database) (6)

*Clathria* (*Clathria*) "aplysiella" Burton, unpublished MS name (Indonesia, ZMA database) (6, Burton MS)

*Clathria* (*Clathria*) *basilana* Lévi, 1961 (Sulawesi, Zamboanga, Philippines; Sumba, Indonesia) (6,7, QM/NTM collection)

*Clathria* (*Clathria*) *chelifer* (Hentschel, 1911); Hooper, 1996 (Hon Trung Lon, Vietnam) (3)

*Clathria* (*Clathria*) *dubia* Burton, unpublished MS name (Indonesia, ZMA database) (6, Burton MS)
Clathria (Clathria) inanchorata Ridley & Dendy, 1886; Kieschnick, 1896; Hooper, 1996 (Ternate, Moluccas, Indonesia) (6)

Clathria (Clathria) meyeri (Bowerbank, 1877); Hooper, 1996 (Irian Jaya, SE. Indonesia) (6)

Clathria (Clathria) pellucida Whitelegge, 1897 (Indonesia, ZMA database) (6, Burton MS)

Clathria (Clathria) spongodes Dendy, 1922 (Indonesia, ZMA database) (6, Burton MS)

Clathria (Clathria) succinea (Esper, 1797); Hooper, 1996 (Indonesia) (6)

Clathria (Clathria) "tubulosa" Burton, unpublished MS name (Indonesia, ZMA database) (6, Burton MS)

Clathria (Clathria) spp. (Nha Trang, Vietnam, PIBOC database) (3)

Clathria (Isaciella) eccentrica Burton, 1934; Hooper, 1996 (Sumba, SE. Indonesia) (6)

Clathria (Isaciella) sp. 1758 (Manado, Indonesia) (6, QM/NTM collection)

Clathria (Microciona) aceratoobtusa (Carter, 1887); Hooper, 1996 (Ko Samui, Gulf of Thailand; King L, Mergui Archipelago, Burma, 12° 08' N) (1,3)

Clathria (Microciona) atrata (Bowerbank, 1862); Burton & Rao, 1932:344; Hooper, 1996; Pattanayak, 1997 (off Cape Negrais, Burma, 15° 50' N; Nicobar and Andaman Islands) (1)

Clathria (Microciona) claudiae Hooper, 1996; Lévi & Lévi, 1989 (as ‘acanthoxa’) (Philippines) (7)

Clathria (Microciona) hentscheli Hooper, 1996; Hentschel, 1912 (as ‘lendenfeldi’) (Aru L, SE. Indonesia) (6)

Clathria (Microciona) rhopalophora (Hentschel, 1912); Thomas, 1970; Hooper, 1996 (Cocos-Keeling; Aru L, Indonesia) (1,6)

Clathria (Microciona) similis (Thiele, 1903); Hooper, 1996 (Ternate, Moluccas, Indonesia) (6)

Clathria (Microciona) tetrastyla (Hentschel, 1912); Hooper, 1996 (Aru L, Indonesia) (6)

Clathria (Microciona) thielei (Hentschel, 1912); Hooper, 1996 (Aru L, Indonesia) (6)

Clathria (Microciona) n.sp. (Singapore; QM/ZRC collections) (2)

Clathria (Microciona) sp.; George & George, 1987 (Bodgaya Islands and Pulau Sipadan, Sabah) (4)

Clathria (Thalysias) abietina (Lamarck, 1813); Lévi & Lévi, 1989; Hooper, 1996 (Palawan, Philippines, SE. Indonesia, as ‘acuta’, ‘abietina’) (6,7, QM/NTM collection)

Clathria (Thalysias) aureas (Hentschel, 1912); Lévi, 1958; Hooper, 1996 (Aru L, Indonesia) (6)

Clathria (Thalysias) calohela (Hentschel, 1912); Hooper, 1996 (Aru L, SE. Indonesia) (6)

Clathria (Thalysias) “camerata”; Dawydoff, 1952 (Vietnam, Cambodia) (attributed to Ridley, 1884) (3)

Clathria (Thalysias) cervicornis (Thiele, 1903); George & George, 1987 (photo 3G); Hooper, 1996 (Ternate, Moluccas; Aru L, SE. Indonesia; Bodgaya Islands and Pulau Sipadan, Sabah; Singapore; QM/ZRC collections) (2,4,6)

Clathria (Thalysias) coppingeri Ridley, 1884; Hentschel, 1912; Brondsted, 1934; Hooper, 1996 (Aru L, SE. Indonesia) (6)

Clathria (Thalysias) coralliophila (Thiele, 1903); Dawydoff, 1952; Hooper, 1996 (Moluccas, Indonesia; Vietnam) (3,6)

Clathria (Thalysias) cratitia (Esper, 1797); Thiele, 1899; Thiele, 1903; Hooper, 1996 (Ternate, Moluccas, Indonesia) (6)

Clathria (Thalysias) distincta (Thiele, 1903); Hentschel, 1912; Hooper, 1996 (Ternate, Moluccas, Indonesia) (6)

Clathria (Thalysias) erecta (Thiele, 1899); Thiele, 1903; Lévi, 1961; Hooper, 1996 (Ternate, Moluccas; Sulawesi, Indonesia; Vietnam) (3,6)

Clathria (Thalysias) eurya (de Laubenfels, 1954) (Indonesia, ZMA database) (6)

Clathria (Thalysias) fasciculata Wilson, 1925:442; Cabrery, 1981:20; Hooper, 1996 (Sulawesi, Indonesia; Zamboanga, Batangas, Bohol, Pangasinan, Mindoro Oriental, Quezon, Masbate, Philippines) (6,7)

Clathria (Thalysias) filifera (Ridley & Dendy, 1886); Thiele, 1899; Thiele, 1903; Dragnewitsch, 1906; Dawydoff, 1952; Hooper, 1996 (Singapore; Indonesia; Masbate, Philippines; Vietnam) (2,3,6,7)

Clathria (Thalysias) kieschnicki Hooper, 1996; Kieschnick, 1900 (as ‘cylindricus’) (Ternate, Moluccas, Indonesia) (6)

Clathria (Thalysias) lendenfeldi Ridley & Dendy, 1886; Hentschel, 1912; Hooper, 1996 (AIMS/NCI collection; Andaman Sea, Thailand; Aru L, SE. Indonesia) (1,6, QM/NTM collection)

Clathria (Thalysias) longitoxa (Hentschel, 1912); Hooper, 1996 (Aru L, SE. Indonesia) (6)

Clathria (Thalysias) major Hentschel, 1912; Hooper, 1996 (Aru L, SE. Indonesia) (6)

Clathria (Thalysias) michaelsteni (Hentschel, 1912); Hooper, 1996 (Aru L, SE. Indonesia) (6)

Clathria (Thalysias) mutabilis (Topsent, 1897); Desqueyroux-Faudenz, 1981; Hooper, 1996 (Ambon, Banda Sea, Indonesia) (6)

Clathria (Thalysias) nuda Hentschel, 1912; Hooper, 1996 (Aru L, Indonesia) (6)
**Family Raspailiidae Hentschel, 1923**

**Definition.** - Encrusting, massive, lobate, fan-shaped or branching growth forms, usually with a very hspid surface; specialised ectosomal skeleton consists of brushes of small thin styles or oxeas, surrounding individual long thick styles or oxeas; choanosomal skeleton varies from a compressed axial skeleton, to plumbo-reticulate or exclusively reticulate.
structures; spongin fibres usually completely enclose coring spicules (choanosome styles, oxeas or both); fibres echinated by spined styles, or modifications to styles; microscleres usually absent, sometimes single raphides or bundles (trichodragmata); reproduction typically oviparous.

SOUTH CHINA SEA SPECIES.

Acanthostylotella cornuta Topsent, 1897; Desqueyroux-Faundez, 1981 (Ambon, Indonesia) (6) [incertae sedis]

Aulospongus (‘Heterecta’) villosa (Thiele, 1899) (Indonesia, ZMA database) (6)

Axechinia rapsaloidea Hentschel, 1912; Hooper, 1991 (Aru Is, SE.Indonesia) (6)

Ceratopson axfera (Hentschel, 1912); Hooper, 1991 (Aru Is, SE.Indonesia) (6)

Ceratopson erecta Thiele, 1899 (Indonesia, ZMA database) (6)

Ceratopson “horrida” Burton, unpublished MS name (Indonesia, ZMA database) (6, Burton MS)

Cyamon aruanense Hentschel, 1912; Hooper, 1991 (Aru Is, SE.Indonesia) (6)

Echinodictyum aceratus (Carter, 1887):67, pl.5, figs 3-6 (King I., Mergui Archipelago, Burma, 12° 08'N) (1)

Echinodictyum asperum (Ridley & Dendy, 1886); Topsent, 1897; Burton & Rao, 1932:348; Dawydoff, 1952; Lévi, 1961; Desqueyroux-Faundez, 1981; Hooper, 1991; Pattanayak, 1997 (Ross I., Andaman Is, 12°N; Nicobar and Andaman Islands; Ambon, Indonesia, ZMA database; Lingayen Gulf, Philippines; Vietnam) (1,3,6,7)

Echinodictyum cancellatum (Lamarck, 1814); Hooper, 1991 (Aru Is, SE.Indonesia) (6)

Echinodictyum carlinoides (Lamarck, 1814); Hentschel, 1912 (as ‘glomeratum’); Hooper, 1991 (Aru Is, SE.Indonesia) (6)

Echinodictyum cavernosum Thiele, 1899 (Indonesia, ZMA database) (6)

Echinodictyum clathratum Dendy, 1905 (Indonesia, ZMA database) (6)

Echinodictyum conulosum Kieschnick, 1900; Hooper, 1991 (Ternate, Moluccas, Indonesia) (6)

Echinodictyum flabelliforme Sollas; Dawydoff, 1952 (Vietnam, Cambodia) (3)

Echinodictyum gorgonoides Dendy; Dawydoff, 1952 (Vietnam, Cambodia) (3)

Echinodictyum lacunosum Kieschnick, 1900; Hooper, 1991 (Ternate, Moluccas, Indonesia) (6)

Echinodictyum mesenterinun (Lamarck, 1813); Hooper, 1991 (Negros Oriental, SW. Cebu, Philippines; Aru I., Indonesia; Singapore; QM/ZRC collections) (2,6,7)

Echinodictyum pulchrum Brondsted, 1934 (Java, Banda, Indonesia) (6)

Echinodictyum rugosum Hentschel, 1912; Hooper, 1991 (Aru Is, SE.Indonesia) (6)

Ectyplasia tabula (Lamarck, 1813); Hooper, 1991 (SE. Indonesia, ZMA database) (6)

Endectyon (‘Hemectyon’) fruticosum Dendy, 1887. Phuket region, Thailand (1, QM/NTM collection)

Endectyon fruticosum Dendy aruensis (Hentschel, 1912); Hooper, 1991 (Aru Is, SE.Indonesia; Phuket, Thailand) (1,6)

Euryzon clavatum Topsent, 1896; Hooper, 1991 (Indonesia, ZMA database) (6)

Raspsallia (Clathriodendron) sp. 973 (Ko Samui region, Thailand) (3, QM/NTM collection)

Raspsallia (Raspsallia) hispidus (Montagu, 1818); Carter, 1887:66 (King I., Mergui Archipelago, Burma, 12° 08'N) (1)

Raspsallia (Raspsallia) vestigifera Dendy, 1896 (Sulawesi, Indonesia) (6, QM/NTM collection)

Raspsallia (Raspsallia) vinimalis (Schmidt, 1862); Burton & Rao, 1932; Pattanayak, 1997 (Nicobar and Andaman Islands) (1)

Raspsallia (Raspsallia) sp. 1772 (Palawan, Philippines) (7, QM/NTM collection)

Raspsallia sp. (Nha Trang, Vietnam, PIBOC database) (3)

Raspsallia sp.nov.; Dawydoff, 1952 (Poulo-Dama, Vietnam) (3)

Raspsallia (Syringella) australiensis Ridley, 1884; Hooper, 1991 (Indonesia, ZMA database) (6)

Raspsallia (Syringella) nudiflora (Hentschel, 1911) (Sulawesi, Indonesia; Singapore) (2,6, QM/NTM/ZRC collections)

Raspsallia (Syringella) sp. 949 (Phuket region Thailand) (1, QM/NTM collection)

Raspsallia (Syringella) sp. 1644 (SW. Cebu, Pulangbato, Philippines) (7, QM/NTM collection)

Raspsallia (‘Parasyringella’) clathrata Ridley, 1884 (Indonesia, ZMA database) (6, Burton MS)

Thrinacopora cervicornis Ridley & Dendy, 1886; Hentschel, 1912 (as ‘rhaphidophora’); Hooper, 1991 (Philippines; Sulawesi, Aru I., SE.Indonesia) (6,7, QM/NTM collection)

Thrinacopora incurvata Kieschnick, 1896 (Ternate, Moluccas, Indonesia) (6)

Trikentrition elegans Lendenfeld, 1887 (Indonesia, ZMA database) (6, Burton MS)

Trikentrition flabelliforme Hentschel, 1912; Hooper, 1991 (Aru Is, SE.Indonesia) (6)
Family Rhabderemiidae Topsent, 1928

**Definition.** - Encrusting, massive, bulbous or digitate growth forms; skeleton without axial compression, usually plumose or plumo-reticulate, composed of light spongin fibres cored by bouquets of entirely smooth, slightly spined or entirely spined rhabdostyles; microscleres are normal or contort sigmas, microstyles and thraustoxeas (all with or without microspines).

**SOUTH CHINA SEA SPECIES.**
- *Rhabderemia acanthostyla* Thomas, 1968; Hooper, 1990 (as 'conulosa' Lévi MS); van Soest & Hooper, 1993 (Salayer; Sumbawa; Take Karlarang; Sulawesi, Indonesia; Nha Trang, Vietnam) (3,6)
- *Rhabderemia forcipula* (Lévi & Lévi, 1989); van Soest & Hooper, 1993 (Mindoro, Philippines; Phuket region, Thailand) (1, QM/NTM collection,7)
- *Rhabderemia indicus* Dendy, 1905; van Soest & Hooper, 1993 (Ko Samui, Gulf of Thailand; Indonesia, ZMA database) (3,6)
- *Rhabderemia prolifera* (Annandale, 1915); Thomas, 1979; van Soest & Hooper, 1993; Pattanayak, 1997 (Nicobar and Andaman Islands) (1)

Suborder Myxillina

**Family Anchinoidae Topsent, 1928**

**Definition.** - Poecilosclerida with microscleres consisting of tridentate-derived chelae, but never toxas; ectosomal megascleres are diactinal, although aniso-terminations commonly occur, and terminal spination of these spicules is absent, or if present they are usually coarse or irregular.

**SOUTH CHINA SEA SPECIES.**
- *Hamigeria ternatensis* Thiele, 1899 (Indonesia, ZMA database) (6)
- *Kirpatrickia spiculophila* (Burton & Rao, 1932:332, pl.18, fig.5); Pattanayak, 1997 (Port Blair, Andaman Is, 11° 50’N; West Andaman Is; Nicobar and Andaman Islands) (1)
- *Phorbas* ('Pronax') *arborescens* (Topsent, 1897); Desqueyroux-Faundez, 1981 (Ambon, Indonesia) (6)
- *Phorbas* sp. (Indonesia, ZMA database) (6)

Family Coelosphaeridae Hentschel, 1923

**Definition.** - Spherical, club-shaped, tubular, and cushion-shaped growth forms, frequently burrowing or excavating coralline substrates (with long, open and/or blind fistules on upper surface bearing oscules and ostia poking above the substrate); ectosomal skeleton a tangential crust of smooth diactinal (usually tylote) spicules, occasionally secondarily lost; choanosomal skeleton reduced, composed of a delicate reticulation of smooth or acanthose styles,
occasionally oxes or strongyles, forming plumoreticulate tracts and cavernous internal chambers; microscleres include sigmas, arcuate isochelae, occasionally modified to unguiferous, th.aumatose or biorulate forms; toxas absent.

**SOUTH CHINA SEA SPECIES.**

*Acanthodorx fibrosa* Lévi, 1961 (SW Cebu, Philippines; Sulawesi, Zamboanga, Indonesia) (6,7, QM/NTM collection)

*Coeleaoteria sinaporensis* (Carter, 1883:326, pl.13, fig.17); Lindgren, 1897, 1898 (Singapore, 1° 15' N, China Sea); Dawydoff, 1952 (Vietnam); Lévi, 1961; 518 (Zamboanga, Philippines) (2,3,6,7)

*Coelosclera dichelata* Hentschel, 1912 (Aru Is, Indonesia) (6)

*Coelosclera dichelata* Hentschel gracilis Hentschel, 1912 (Aru Is, Indonesia) (6)

*Coelosclera* (*Histoderma*) *fucoides* (Topsent, 1897); Burton & Rao, 1932:354 (off Cape Negrais, Burma, 15°50'N, 80-90m) (1)

*Coelosclera* (*Histoderma*) *navicelligera* (Ridley & Dendy, 1886); Lindgren, 1897; 482; Lindgren, 1898; Dawydoff, 1952 (Vietnam, China Sea, 11° 5'N; Indonesia, ZMA database) (3,5,6)

*Coelosclera navicelligera* Ridley *arvensis* Hentschel, 1912 (Aru Is, Indonesia) (6)

*Coelosclera toxifera* Wilson, 1925:435 (Philippines) (7)

*Coelosclera* sp. (Indonesia, ZMA database) (6)

*Ectydoxyx* sp. 946 (Phuket region, Thailand) (1, QM/NTM collection)

*Ectydoxyx* sp. 1001 (SW. Cebu, Philippines) (7, QM/NTM collection)

*Ectydoxyx* sp. 1281 (Sulawesi, Indonesia) (6, QM/NTM collection)

*Forceptia mertonii* Hentschel, 1912 (Aru Is, Indonesia) (6)

*Lissodendoryx arenaria* Dendy, 1905 (Indonesia, ZMA database) (6)

*Lissodendoryx aspera* (Bowerbank, 1875); Hofman & van Soest, 1995:89 (Ambon, Moluccas, Ternate, Aru Is., Sulawesi, Indonesia) (6, QM/NTM collection)

*Lissodendoryx bifacialis* Lévi & Lévi, 1983 (Indonesia, ZMA database) (6)

*Lissodendoryx fucoides* Topsent, 1897; Desqueyroux-Faundez, 1981 (Ambon, Indonesia) (6)

*Lissodendoryx gratia* (Thiele, 1903); Hofman & van Soest, 1995:84 (Ternate, East of Komodo 8°35'S 119°34.2'E, Indonesia, ZMA database) (6)

*Lissodendoryx isolicrvalis* (Carter, 1882) (Indonesia, ZMA database; Quezon, Philippines) (6,7)

*Lissodendoryx* "lingua" Burton, unpublished MS name (Indonesia, ZMA database) (6, Burton MS)

*Lissodendoryx microchelifera* Hofman & van Soest, 1995:96 (N Cape Komodo, Indonesia, ZMA database) (6)

*Lissodendoryx paucispinata* (Ridley & Dendy, 1886); Hofman & van Soest, 1995:85 (Indonesia, ZMA database) (6)


*Lissodendoryx schmidti* Ridley, 1884 (Indonesia, ZMA database) (6)

*Lissodendoryx similis* Thiele, 1899; Burton & Rao, 1932;331; Hofman & van Soest, 1995:90 (Marble Rocks, Mergui Archipelago, 11°33'N; Jack and Una Is, Mergui Archipelago, 11°40'N; Ambon, Madras, Kema,Celebes, Moluccas, Jedaan Is., Indonesia, ZMA database) (1,6)

*Lissodendoryx toviensis* Wilson, 1925:332 (Philippines, Indonesia, ZMA database) (6,7)

*Lissodendoryx tenuatensis* (Thiele, 1903); Hofman & van Soest, 1995:92 (Ternate, Moluccas, Balikpapan, Kalimantan, Indonesia, ZMA database) (6)

*Lissodendoryx timorenensis* Hofman & van Soest, 1995:95 (NE of Timor, Indonesia, ZMA database) (6)

*Lissodendoryx* sp. (Indonesia, ZMA database) (6)

**Family Crambiidae Lévi, 1963**

**Definition.** - Encrusting or massive growth forms; ectosomal megascleres consist of smooth subtylostyles, usually standing perpendicular to surface; choanosomal megascleres are smooth or acanthose styles-tylostyles forming hymedesmoid, plumose or plumoreticulate skeletal structures, with a secondary interlocking desma ("sublithistid") skeleton common; microscleres anchorate or unguiferous isochelae.
### Family Crelldae Hentschel, 1923

**Definition.** - Encrusting, massive, club-shaped and branching growth forms; choanosomal skeleton regularly reticulate or plumo-reticulate, composed of bundles of smooth oxeas; ectosomal skeleton with a thick crust of tangentially placed acanthostyles and/or acanthoxeas; acanthose spicules may also be embedded perpendicular to skeletal tracts and/or erect on basal spongin (= echinating basal acanthostyles), and dispersed within the choanosome between the tracts of smooth diaactines; microscleres arcuate isochelae, antischelae and sigmas.

### South China Sea Species.

<table>
<thead>
<tr>
<th>Species</th>
<th>Collection/Location</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Crellea cyathophora</em> Carter, 1886</td>
<td>Indonesia, ZMA database</td>
<td>6</td>
</tr>
<tr>
<td><em>Crellea myxilloides</em> Burton, unpublished MS name</td>
<td>Indonesia, ZMA database</td>
<td>6, Burton MS</td>
</tr>
<tr>
<td><em>Crellea</em> sp.</td>
<td>Indonesia, ZMA database</td>
<td>6</td>
</tr>
<tr>
<td><em>Crellea</em> 1019</td>
<td>Negros Oriental, Philippines</td>
<td>7, QM/NTM collection</td>
</tr>
</tbody>
</table>

### Family Hymedesmiidae Topsent, 1928

**Definition.** - Persistently encrusting growth form: oscules and ostia usually on papillae, or ostia grouped over subdermal cavities; spined bases of intermingled large choanosomal styles and smaller acanthostyles embedded in a basal layer of spongin, standing perpendicular to the substrate; smooth, often polytylote, diactinal (tornotes, anisotornotes or oxeas) or sometimes monactinal spicules (styles), occur singly or form bundles on the surface; microscleres palmate, arcuate or unguiferous isochelae, sigmas, forceps, and sometimes also anisochelae; toxas never present.

### South China Sea Species.

<table>
<thead>
<tr>
<th>Species</th>
<th>Collection/Location</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Hymedesmia hallicz</em> Topsent, 1900</td>
<td>Sattahip Navy base region. Thailand</td>
<td>3, QM/NTM collection</td>
</tr>
<tr>
<td><em>Hymedesmia mertoni</em> Hentschel, 1912</td>
<td>Aru Is, Indonesia</td>
<td>6</td>
</tr>
<tr>
<td><em>Hymedesmia parvispicula</em> Burton &amp; Rao, 1932; fig.16</td>
<td>Mergui Archipelago</td>
<td>1</td>
</tr>
<tr>
<td><em>Hymedesmia parvispiculata</em> Vacelet, Vasseur &amp; Lévi, 1976</td>
<td>Indonesia, ZMA database</td>
<td>6</td>
</tr>
<tr>
<td><em>Hymedesmia prostrata</em> Thiele, 1903</td>
<td>Indonesia, ZMA database</td>
<td>6</td>
</tr>
<tr>
<td><em>Hymedesmia</em> sp.</td>
<td>(Sattahip Navy base region. Thailand)</td>
<td>3, QM/NTM collection</td>
</tr>
<tr>
<td><em>Hymedesmia</em> spp.</td>
<td>Indonesia, ZMA database</td>
<td>6</td>
</tr>
</tbody>
</table>
Family Myxillidae Topsent, 1928

**Definition.** - Encrusting, massive, fan-shaped and branching sponges; specialised ectosomal skeleton composed of diactinal tylotes or tornotes with smooth or microspined, slightly swollen bases, arranged as bouquets or lying paratangential or perpendicular to the surface; choanosomal skeleton composed of isotropic, anisotropic or plumose tracts of smooth or partially spined monactinal or diactinal choanosomal megascleres (or choanosomal spicules replaced within the skeleton by ectosomal megascleres), sometimes echinated by small acanthose styles; spongin development variable, usually consisting of light spongin cementing spicule together at their nodes, but sometimes with heavy fibres; microscleres anchorate isochelae and/or derivatives (spatulate, unguiferous or birotulate chelae, sometimes anisochelate), sometimes together with palamate isochelae, smooth sigmas and forceps.

**SOUTH CHINA SEA SPECIES.**
- *Amphilectus furcatus* Vosmaer, 1880 (Indonesia, ZMA database) (6, Burton MS)
- *Amphilectus pilorus* Kieschnick, 1896 (Ternate, Moluccas, Indonesia) (6)
- *Domiriopsis bronstdi* (Burton, 1928:124); Pattanayak, 1997 (Andaman Is, 260-580m, 12°N; Nicobar and Andaman Islands) (1)
- *Desmacidon fragilis* Kieschnick, 1900 (Ternate, Moluccas, Indonesia) (6)
- *Desmacidon fruticosum* (Montagu, 1818) Kieschnick, 1900 (Ternate, Moluccas, Indonesia) (6)
- *Desmacidon nodosus* Kieschnick, 1900 (Ternate, Moluccas, Indonesia) (6)
- *Desmacidon ternatensis* Kieschnick, 1900 (Ternate, Moluccas, Indonesia) (6)
- *Desmacidon reptans* Ridley & Dendy, 1886; Lindgren, 1897:482; Lindgren, 1898; Dawydoff, 1952 (Vietnam, China Sea, 11° 5’N) (3)
- *Desmapsamma cf. anchorata* Carter, 1882 (Indonesia, ZMA database) (6)
- *Hymenancora lundbecki* Hentschel, 1912 (Aru Is, Indonesia) (6)
- *Iotrochota baculifera* (Ridley, 1884); Lindgren, 1897, 1898; Burton & Rao, 1932:353; Dawydoff, 1952; Lavri, 1961:518; Pattanayak, 1997 (NW side of Spitful Bay, near Leader Point, Nicobar Is, 8°N; Satthaip region, Thailand; Nicobar and Andaman Islands; Vietnam; China Sea; Indonesia, ZMA database, Zamboanga, Philippines; Singapore; QM/ZRC collections) (1,2,3,6,7)
- *Iotrochota birotulata*; Jung et al., 1995 (South China Sea) (5)
- *Iotrochota purpurea* Bowerbank, 1875; Dawydoff, 1952 (Vietnam; Indonesia, ZMA database) (3,6)
- *Iotrochota sp.* (Nha Trang, Vietnam, PIBOC database) (3)
- *Isodictya simulans* Bowerbank; Carter, 1887:69, pl.6, figs 1-2 (King I., Mergui Archipelago, Burma, 12° 08’N) (1)
- *Myxilla dendyi* Burton, 1959 (Indonesia, ZMA database) (6)
- *Myxilla ramosa* Kieschnick, 1896 (Ternate, Moluccas, Indonesia) (6)
- *Myxilla* (‘Dendoryx’) *mollis* (Lindgren, 1897: 482); Lindgren, 1898 (Hirudo Straits, China Sea) (3)
- *Myxilla rosacea* Lindgren, 1897; Dawydoff, 1952 (Vietnam, Cambodia) (3)
- *Myxilla* (‘Dendoryx’) *rosacea var. japonica* (Ridley & Dendy, 1886); Lindgren, 1897: 482; Lindgren, 1898 (Hirudo Straits, China Sea) (3)
- *Myxilla* (‘Steledoryx’) “regularis” (Burton, unpublished MS name) (Indonesia, ZMA database) (6, Burton MS)
- *Myxilla* sp. (Nha Trang, Vietnam, PIBOC database) (3)

Family Phoriospongiidae Lendenfeld, 1888

**Definition.** - Encrusting, massive, flabellate or digitate growth forms; Ectosomal skeleton frequently absent, replaced by arenaceous or spicular detritus, but typically with areolate oscular sieve plates on surface; ectosomal and choanosomal megascleres undifferentiated, usually strongyles (sometimes secondarily lost); choanosomal spicules are auxiliary megascleres (of ectosomal origin), whereas principal spicules are absent; microscleres arcuate isochelae, sometimes modified to unguiferous or birotulate forms.
**Family Tedaniidae Ridley & Dendy, 1886**

**Definition.** - Encrusting, massive or digitate sponges; choanosomal skeleton predominantly plumo-reticulate or even plumose, composed of tracts of smooth or spined monoactinal megascleres, or smooth dialactinal megascleres, enclosed within light or moderate spongins fibres, or with no visible fibres and spicules merely cemented together at their nodes; ectsosomal spicules are dialactinal, tylotes or strongyles, usually with spined bases, lying tangential, paratangential or erect on the surface, although usually not in bundles; microscleres onychaeetes; chelae are absent.

**SOUTH CHINA SEA SPECIES.**

- **Batzella sp.** (Indonesia, ZMA database) (6)
- **Chondropsis arenifera** (Carter, 1886) (Indonesia, ZMA database) (6, Burton MS)
- **Chondropsis conica** (Lendenfeld, 1889) (Indonesia, ZMA database) (6, Burton MS)
- **Ectyobatzella enigmatica** (Burton & Rao, 1932:332, pl.18, fig.6); Pattanayak, 1997 (Nicobar I., 7°N; Nicobar and Andaman Islands) (1)
- **Hemimunida sp.**; George & George, 1987 (Bodgaya Islands and Pulau Sipadan, Sabah) (4)
- **Psammocellassa (*Psammonemmes*) “marshalli”** Burton, unpublished MS name (Indonesia, ZMA database) (6, Burton MS)
- **Strongylacidon sphinctarum** Lendenfeld, 1908 (Indonesia, ZMA database) (6)
- **Strongylacidon stellaris** Dendy, 1924 (Indonesia, ZMA database) (6)
- **Strongylacidon sp.** 1287 (Sulawesi, Indonesia) (6, QM/NTM collection)

**Suborder Mycalina**

**Definition.** - Poecilosclerida with microscleres consisting of sigmancistra derivatives and megascleres being substylstyles, with swollen bases and faintly constricted necks (mycalostyles), usually of a single smooth category (never echinating).
Family Cladorhizidae de Laubenfels, 1936

Definition. - Small symmetrical sponges mostly found in the abyssal zones, with diagonal, radiating supporting processes and basal root adaptations for living in soft sediments; choanosomal skeleton consists of an axis composed of monactinal (styles) or occasionally diactinal megascleres (oxees), from which radiating extra-axial tracts diverge to the ectsosome; microscleres include isochelae, sigmas, forceps or spear-shaped microstyles.

SOUTH CHINA SEA SPECIES.
Chondrocadia clavata Ridley & Dendy, 1886 (Indonesia, ZMA database) (6, Burton MS)
Chondrocadia crinita Ridley & Dendy, 1887 (Indonesia, ZMA database) (6)
Chondrocadia “rhexyoides” Burton, unpublished MS name (Indonesia, ZMA database) (6, Burton MS)
Cladorhiza depressa Kieschnick, 1896 (Ternate, Moluccas, Indonesia) (6)
Cladorhiza pentacrinus Dendy, 1884 (Indonesia, ZMA database) (6, Burton MS)
Cladorhiza spp. (Indonesia, ZMA database) (6)

Family Guitarridae Burton, 1929

Definition. - Encrusting, massive or ramose growth forms; special ectsosomal spicules absent, but choanosomal spicules may protrude through surface; choanosomal skeleton is reticulate, isodictyal-reticulate or plumoreticulate, with a single category of subtlylstyles: microscleres placochelae and modifications, sometimes also with palmate isochelae and sigmancistras.

SOUTH CHINA SEA SPECIES.
Guitarra indica Dendy, 1916 (Indonesia, ZMA database) (6)

Family Desmacellidae Ridley & Dendy, 1886

Definition. - Encrusting, massive, cup-shaped, fan-shaped and branching growth forms; megascleres usually styles, sometimes also including oxees or strongyles; spicules typically enclosed within plumose, reticulate, halichondroid-reticulate or compressed axial fibres; microscleres are diverse, always consisting of sigmas, and often including microoxees of several sizes, raphides in bundles or individually, toxas, microstrongyles and spheres.

SOUTH CHINA SEA SPECIES.
Bienva aromensis Hentschel, 1912 (Aru Is, Indonesia) (6)
Bienva democratica Sollas, 1902:213, pl.15, fig.9 (Pulau Bidang, NE of Penang, 5° 30’N) (2)
Bienva “enigmatica” Burton, unpublished MS name (Indonesia, ZMA database) (6, Burton MS)
Bienva fistulosa Topsent, 1897; Pulitzer-Finali, 1980; Desqueyroux-Faunudez, 1981 (Ambon, Indonesia; Hong Kong) (5,6)
Bienva forix Topsent, 1897; Sollas, 1902:213; Desqueyroux-Faunudez, 1981; Lévi, 1961: 134 (Pulau Bidang, NE of Penang, 5° 30’N; Vietnam; Sulawesi, Ambon, Indonesia) (2,3,6, QM/NTM collection)
Bienva fragilis Kieschnick, 1900 (Ternate, Moluccas, Indonesia) (6)
Bienva humilis Thiele, 1903 (Indonesia, ZMA database) (6)
Bienva liposigma Burton, 1928:120; Pattanayak, 1997 (Andaman Is, 540m, 12°N; Nicobar and Andaman Islands; Indonesia, ZMA database) (1,6, Burton MS)
Bienva megalosigma Hentschel, 1912 (Aru Is, Indonesia) (6)
Bienva megalosigma lipophora Hentschel, 1912 (Aru Is, Indonesia) (6)
Bienva trirhaphis Topsent, 1897; Desqueyroux-Faunudez, 1981 (Ambon, Indonesia) (6)
Bienva trinonata Hentschel, 1912 (Aru Is, Indonesia) (6)
Family Hamacanthidae Gray, 1872

**Definition.** - Encrusting to massive sponges; skeleton consists of a tangential ectosomal and reticulate choanosomal skeletal components, composed of monactinal (styles), diactinal (oxeas), or both sorts of megascleres producing multispecific tracts and forming irregular, plumo-reticulate or reticulate structures, with little or no associated spongins; scattered monactinal or diactinal megascleres, or bundles of these spicules, occur within the mesohyl; microscleres sharp-toothed diancistras or cyrtancistras, sometimes with toxas, individual or bundles of raphides (trichodragmata), or sigmas.

**SOUTH CHINA SEA SPECIES.**

*Hamacantha "pyiformis"* Burton, unpublished MS name (Indonesia, ZMA database) (6, Burton MS)

*Hamacantha* sp. (Indonesia, ZMA database) (6)

Family Mycalidae Lundbeck, 1905

**Definition.** - Encrusting, massive, fan-shaped, cup-shaped and branching growth forms; subectosomal sculpturing, grooves and ridges often found on the surface, within which are usually found the ostia; skeleton radially arranged, plumose or plumo-reticulate, composed of styles or oxeas enclosed in spongins fibres; without specialised ectosomal spicules, although choanosomal spicules may form dense brushes at the surface; microscleres anisochelae, but may also include many other forms - palmate isochelae with geometric modifications, sigmas, toxas and raphides.

**SOUTH CHINA SEA SPECIES.**

*Arenochalina* sp. (Singapore; QM/ZRCI collections) (2)

*Esperopis challengeri* Ridley & Dendy, 1886 (Indonesia, ZMA database) (6)

*Mycale eugeniropodia* (Johnston, 1842:119); Wilson, 1925:426 (Philippines) (7)

*Mycale bidentata* Dendy, 1905 (Indonesia; ZMA database) (6)

*Mycale "carinata"* Burton, unpublished MS name (Indonesia, ZMA database) (6, Burton MS)

*Mycale cavernosa* Bergquist, 1965 (Indonesia, ZMA database) (6)

*Mycale cleistochela* Vacelet & Vasseur, 1971 (Indonesia, ZMA database) (6)

*Mycale cockburniana* Hentschel, 1911 (Indonesia, ZMA database) (6)

*Mycale ("Sceptrosporgia") coronata* (Dendy, 1926); Burton, 1928:121 (8 mls W of Interview I., Andaman Is, 90-340m, 13°3N) (1)
**Mycale crassissima** Dendy, 1905: Lévi, 1961: 134; Pattanayak, 1997 (Nicobar and Andaman Islands; Vietnam; Indonesia, ZMA database) (1,3,6)

**Mycale densi** (Row, 1911) (Indonesia, ZMA database) (6, Burton MS)

**Mycale eudiceliioides** Row, 1911 (Indonesia, ZMA database) (6)

**Mycale euplctelioides regularis** Wilson, 1925:427 (Philippines) (7)

**Mycale gelatinosa** (Ridley & Dendy, 1886) (Indonesia, ZMA database) (6, Burton MS)

**Mycale grandis** Gray, 1867 (Indonesia, ZMA database) (6)

**Mycale graveleyi** Burton, 1937 (Indonesia, ZMA database) (6)

**Mycale indica** (Carter, 1887:72, pl.6, figs 3-6; Burton & Rao, 1932:327; Pattanayak, 1997 (King L., Mergui Archipelago, Burma, 12° 08’N; Snod L, Mergui Archipelago, 12°N; Ross L., Andaman Is., 12° 09’N; Nicobar and Andaman Islands) (1)

**Mycale cf. laevis** Carter, 1882 (Indonesia, ZMA database) (6)

**Mycale “lagenoides”** Burton, unpublished MS name (Indonesia, ZMA database) (6, Burton MS)

**Mycale macrosigma** (Lindgren, 1897: 482; Lindgren, 1898 (Korea Straits, China Sea) (3)

**Mycale madraspatana** Annandale, 1914 (Indonesia, ZMA database) (6)

**Mycale massa oceania** Topsent, 1904 (Indonesia, ZMA database) (6, Burton MS)

**Mycale “mennyloides”** Burton, unpublished MS name (Indonesia, ZMA database) (6, Burton MS)

**Mycale moluccensis** Thiele, 1903 (Indonesia, ZMA database) (6)

**Mycale mononchotara** Burton & Rao, 1932 (Indonesia, ZMA database) (6)

**Mycale (‘Esperella’) murrayi** (Ridley & Dendy, 1887; Dragnevitsch, 1906:441 (Singapore, 1° 30’N) (2)

**Mycale obscura** Hentschel, 1912 (Aru Is, Indonesia) (6)

**Mycale orientalis** Topsent, 1897; Desqueyroux-Faudunar, 1981 (Ambon, Indonesia) (6)

**Mycale (Zygomycale) parishii** (Bowerbank, 1875; Burton & Rao, 1932:328 (south portion of Malacca Straits, 1°N); George & George, 1987 (Bodgaya Islands and Pulau Sipadan, Sabah; Indonesia, ZMA database) (2,4,6)

**Mycale (‘Esperella’) pellucida** (Ridley, 1884; Dawydoff, 1952 (Vietnam, Cambodia) (3)

**Mycale (‘Esperella’) philippensis** (Dendy); Lindgren, 1897: 482; Lindgren, 1898; Dawydoff, 1952; Pulitzer-Finali, 1980 (Vietnam, China Sea, 11°5’N; Hong Kong) (3,5)

**Mycale phylophila** Hentschel, 1911; van Soest, 1980 (Hong Kong, Indonesia) (5,6)

**Mycale (‘Esperella’) plumosa** (Carter, 1882); Carter, 1887:72 (King L., Mergui Archipelago, Burma, 12° 08’N) (1)

**Mycale raphidotoxoa** Hentschel, 1912 (Aru Is, Indonesia) (6)

**Mycale (Paresperella) sceptroides** (Keller, 1891) (Indonesia, ZMA database) (6, Burton MS)

**Mycale “setosa”** Burton, unpublished MS name (Indonesia, ZMA database) (6, Burton MS)

**Mycale cf. suetza** Row, 1911 (Indonesia, ZMA database) (6)

**Mycale sulcata arunensis** Hentschel, 1912 (Aru Is, Indonesia) (6)

**Mycale (‘Esperella’) sulvoidea** (Sollas, 1902:213, pl.14, figs 8-9, pl.15, fig. 10) (Pulau Bidang, NE of Penang, 5° 30’N; Indonesia, ZMA database) (2,6)

**Mycale temuixstrongylata** Hoshino, 1981 (Indonesia, ZMA database) (6)

**Mycale temuixspiniculata** Dendy, 1905 (Indonesia, ZMA database) (6)

**Mycale spp.** (Indonesia, ZMA database) (6)

**Mycale sp.**; Tanaka et al., 1993 (Gulf of Thailand) (3)

**Mycale sp.**; van Soest & Verseveldt, 1987 (Komodo, 8°S 119°E, Indonesia) (7)

**Mycale sp.** 952 (Phuket region Thailand) (1, QM/NTM collection)

**Mycale sp.** 959 (Phuket region Thailand) (1, QM/NTM collection)

**Mycale sp.** 971 (Ko Samui region, Thailand) (3, QM/NTM collection)

**Mycale sp.**; George & George, 1987 (Bodgaya Islands and Pulau Sipadan, Sabah) (4)

**Mycale sp.** 1283 (Sulawesi, Indonesia) (6, QM/NTM collection)

**Mycale sp.** 1284 (Sulawesi, Indonesia) (6, QM/NTM collection)

**Mycale spp.** (Singapore; QM/ZRC collections) (2)

**Ulosa angulosa** (Lamarck, 1814) (Indonesia, ZMA database) (6)

**Ulosa sp.** (Indonesia, ZMA database) (6)

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**Order Halichondrida**

**Definition.** - Choanosomal skeleton composed of styles, oxeas, strongyles or intermediate spicules; spicules not usually functionally localised to any particular region of the skeleton;
skeletal structures range from disorganised plumoreticulate, criss-crossed “halichondroid skeleton” to distinctly compressed axis (or basal) region and a differentiated extra-axial (radial, plumose or plumoreticulate) region; spongin fibres usually poorly developed or absent; ectosomal skeleton sometimes organised into a tangential layer of spicules or erect spicule bundles, with minimal collagenous spongin, typically with large subectosomal cavities; microscleres sparse including only raphides, microxeas, or spined microxeas with a central bend.

Family Axinellidae Carter, 1875

Definition. - Encrusting, massive, branching, fan-shaped and tubular growth forms; encrusting species may consolidate sedimentary particles at the surface of the substratum; surface usually hispid from projecting spicules; megascleres styles, oxeas, strongyles (sometimes sinuous) in all combinations; skeleton typically divided into distinct axial (or basal in encrusting forms) and extra-axial components; main skeleton typically condensed in axis, consisting of smooth straight spicules in most genera, or tuberculate or spined, annular, flexuous, U-shaped or vermiform strongyles in some genera; extra-axial skeleton plumose or plumoreticulate, with tracts of smooth straight spicules, sometimes rhabdose spicules arising perpendicular to the axis and ascending to the surface; axial and extra-axial differentiation may be reduced (vestigial), but rudiments of these structures are always present; microscleres usually absent, although a few genera have raphides or microraphides, sometimes forming bundles (trichodragnata); reproduction oviparous.

SOUTH CHINA SEA SPECIES.
Acanthella aurantiaca Keller, 1889; Dawydoff, 1952 (Vietnam, Cambodia) (3)
Acanthella carteri Dendy, 1889 (Indonesia, ZMA database) (6)
Acanthella cavernosa Dendy, 1922 (widespread throughout South China Sea) (1-7; most collections)
Acanthella costata Kieschnick, 1896 (Ternate, Moluccas, Indonesia; Batangas, Mindanao, Zamboanga Philippines) (6,7; QM/NTM collection)
Acanthella hispida Pullitzer-Finali, 1980 (Hong Kong) (5)
Acanthella pulcherrima Ridley & Dendy, 1886 (Indonesia, ZMA database) (6)
Acanthella vulgaris Tanita, 1960; Cabrery, 1981:24 (Zamboanga, Batangas, Davao del Norte, Mindoro Occidental, Marinduque, Quezon, La Union, Ilocos Sur, Ilocos NortePhilippines) (7)
Acanthella sp.; George & George, 1987 (Bodgaya Islands and Pulau Sipadan, Sabah) (4)
Auletta lyra (Esper), var. brevispiculata Dendy, 1905; Burton, 1928:128, pl.1, fig.10 (W of Elphinstone I., Mergui Archipelago, 12° 15'N, 120m) (1)
Auletta sp. 960 (Phuket region, Thailand) (3, QM/NTM collection)
Axinella aquariciformis Dendy, 1905 (Indonesia, ZMA database) (6)
Axinella arvensis Hentschel, 1912 (Aru Is, Indonesia) (6)
Axinella carteri Dendy, 1889 (widespread throughout South China Sea) (1-7; most collections)
Axinella domantayi (Lévi, 1961) (Zamboanga Norte, Philippines) (7; QM/NTM collection)
Axinella domani Bowerbank, 1873 (Indonesia, ZMA database) (6)
Axinella echidinia Kieschnick, 1896 (Ternate, Moluccas, Indonesia) (6)
Axinella euctinema Hentschel, 1912 (Aru Is, Indonesia) (6)
Axinella mastigophoda Schmidt; Lindgren, 1897: 483; Lindgren, 1898; Dawydoff, 1952 (Taiwan, China Sea, Vietnam) (3,5)
Axinella cf. polypoides Schmidt; Dawydoff, 1952 (Vietnam, Cambodia) (3)
Axinella proliferans Ridley, 1884 (Indonesia, ZMA database) (6, Burton MS)
Axinella tenodigitata Dendy, 1905 (Indonesia, ZMA database) (6)
Axinella virgulosa Carter, 1887:68, pl.5, fig.11 (King I., Mergui Archipelago, Burma, 12° 08'N) (1)
Axinella virgulosa var. massa Carter, 1887:68, pl.7. figs 6-7 (King I., Mergui Archipelago, Burma, 12° 08'N) (1)
Axinella vulgaris Thiele, 1899 (Indonesia, ZMA database) (6)
Axinella sp. 882 (Phuket region, Thailand) (1, QM/NTM collection)
Axinella sp. 955 (Phuket region, Thailand) (1. QM/NTM collection)
Axinella sp. 1640 (Sulu Sea, Philippines) (7. QM/NTM collection)
Axinella sp. 1769 (Pulangbato, Philippines) (7. QM/NTM collection)
Axinella sp. (Singapore: QM/ZRC collections) (2)
Axinella spp. (Nha Trang, Vietnam. PIBOC database) (3)

*Buibrux columna* (Burton, 1928:130, pl.2, fig.1); Pattanayak, 1997 (Andaman Sea, 13° 17'N, 180m; Nicobar and Andaman Islands) (1)

*Buibrux durissimma* Burton, 1928:131, pl.2, fig.2 (W of Elphinstone I., Mergui Archipelago, 12° 15'N, 120m) (1)

*Buibrux ligulata* Burton, 1928:132, pl.2, fig.3 (W of Elphinstone I., Mergui Archipelago, 12° 15'N, 120m) (1)

*Buibrux vermiculata* Topsent, 1897; Dawydoff, 1952; Desqueyroux-Faundez, 1981 (Ambon. Indonesia; Vietnam) (3,6)

*Buibrux* sp. (Indonesia, ZMA database) (6)

*Drangaxia ciliata* (Wilson, 1925:341; de Laubenfels, 1935:332 (Puerta Galera, Philippines) (7)

*Drangaxia ensifera* (Lamarck, 1814) (Indonesia, ZMA database) (6. Burton MS)

*Homaxinella acanthelloides* Lévi, 1961:515 (Zamboanga, Philippines) (7)

*Homaxinella* sp. 974 (Ko Samui region, Thailand) (3, QM/NTM collection)

*Perissinella "cactoides"* Burton, unpublished MS name (Indonesia, ZMA database) (6. Burton MS)

*Phakellia atypica* Lévi, 1961:516 (Zamboanga, Philippines) (7)

*Phakellia cavernosa* Dendy. 1922 (Phuket region, Thailand) (1, QM/NTM collection)

*Phakellia conulosa* Dendy, 1921 (Negros I. Philippines) (7, QM/NTM collection)

*Phakellia fusca* Zeng et al., 1991b; c; Fu et al., 1991b; Fijder. 1992 (South China Sea) (5)

*Phakellia stipitata* (Carter, 1881) (Suluwesi, Indonesia)

*Phakellia* sp.; Wu et al., 1990 (South China Sea) (5)

*Phakellia* sp. 948 (Phuket region, Thailand) (1, QM/NTM collection)

*Phakellia* sp. 961 (Phuket region, Thailand) (1, QM/NTM collection)

*Phakellia* sp. (Indonesia, ZMA database) (6)

*Phakellia* sp. 1285 (Suluwesi, Indonesia) (6, QM/NTM collection)

*Phakellia* sp. (Singapore: QM/ZRC collections) (2)

*Phycopsis valida* Thiele, 1899 (Indonesia, ZMA database) (6)

*Pseudaxinella massa* Carter, 1887 (Indonesia, ZMA database) (6)

*Ptilocaulis flexibilis* Lévi, 1961: 132 (Vietnam) (3)

*Ptilocaulis cf. spirulifera* (Lamarck, 1813) (Indonesia, ZMA database) (6)

*Reniochalinia* sp. 1643 (Cebu, Philippines) (7, QM/NTM collection)

*Rhabdoplocella topsentii* Hentschel, 1912 (Aru Is, Indonesia) (6)

*Stilissa flabelliformis* (Hentschel, 1912) (SW. Cebu, Philippines) (7, QM/NTM collection)

*Stilissa* sp. 943 (Phuket region, Thailand) (1, QM/NTM collection)

*Stylorella agminata* (Ridley) Hallman, 1914; Lévi, 1961:514 (Zamboanga, Philippines) (7)

*Stylorella digitata gracilis* Hentschel, 1912 (Aru Is, Indonesia) (6)

*Stylorella flabelliformis* Hentschel, 1912 (Aru Is, Indonesia) (6)

*Stylorella suberitoides* Brandsted, 1934 (Aru Is, Indonesia) (6)

*Tragosia cf. infundibiliformis* (Bowerbank); Dawydoff, 1952 (Vietnam, Cambodia) (3)

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**Family Desmoxyidae Hallmann, 1917**

**Definition.** - Encrusting, massive or branching sponges; megascleres are monactinal (styles), diactinal (oxeas), or both, contained within widely spaced multispicular spongine fibres, or with little or no spongine associated, forming reticulate tracts, with poorly developed or no axial compression and poorly differentiated axial and extra-axial skeletons (notably disorganised or slightly plumose); ectosomal skeleton a crust or palisade of smaller oxeotes with spines (occasionally smooth); microscleres smooth or spined microxeas, often centrangular or strongly bent at the centre, and sometimes raphides in groups (trichodragmata) or singly, and in one genus acanthose cladotoxa and birotules are also present.
SOUTH CHINA SEA SPECIES.

*Higginia petrosoides* Dendy, 1922 (Indonesia, ZMA database) (6)
*Higginia striigilata* (Lamarck, 1813) (Indonesia, ZMA database) (6)
*Higginia* sp. (Indonesia, ZMA database) (6)
*Higginia mazzalii* Carter. 1885 (Bohol Sea, Philippines) (7, QM/NTM collection)
*Higginia mixta* (Hentschel, 1912) (Puluangbato, Negros Oriental, SW. Cebu, Philippines) (7, QM/NTM collection)
*Higginia (Dendropuss) mixta* (Hentschel, 1912) (Aru Is, Indonesia) (6)
Myrmekioderma granulata (Esper, 1794) (Indonesia, ZMA database) (6, Burton MS)

Family Dictyoneillidae van Soest, Diaz & Pomponi, 1990

**Definition.** - Chaanoosomal skeleton lacking any axial compression or marked differentiation between axial and extra-axial regions, but has sponin-enforced dendritic or plumose chaanoosomal spicule tracts and a fleshy conulose surface; no ectosomal mineral skeleton; megascleres include oxeas, styles or both in equal proportion; microscleres absent.

SOUTH CHINA SEA SPECIES.

*Dictyoneillia austroleiaisis* Pulitzer-Finali, 1982 (Aru Is, Indonesia) (6)
*Dictyoneillia* spp. (Indonesia, ZMA database) (6)
*Liagista arenosa* Vacelet & Vasseur, 1971 (Indonesia, ZMA database) (6)
*Liagista paradoxa* Thiele, 1899 (Indonesia, ZMA database) (6)
*Scupula arxoxites* Kieschnick, 1896 (Ternate, Moluccas, Indonesia) (6)

Family Halichondriidae Vosmaer, 1887

**Definition.** - Encrusting to massive growth forms, sometimes with specialised fistules on the upper surface; principle megascleres are oxeas, sometimes with accessory styles; chaanoosomal skeleton consists of a high density of spicules arranged in vague, poorly defined, directionless tracts (“halichondroid” structure), or spicules in complete confusion; there is often marked subectosomal or vestibular cavities; microscleres usually absent, occasionally raphides.

SOUTH CHINA SEA SPECIES.

*Amorphinopsis excavans* (Carter, 1887:77, pl.5, figs 12-15) (King L., Mergui Archipelago, Burma. 12° 08’N; Indonesia, ZMA database) (1,6)
*Amorphinopsis foetida* (Dendy); Lévi, 1961: 138 (Vietnam) (3)
*Amorphinopsis (’Cioculptu’) oculata* (Kieschnick, 1896) (Ternate, Moluccas, Indonesia) (6)
*Amorphinopsis sacceformis* (Thiele, 1903) (Indonesia, ZMA database) (6)
*Amorphinopsis (’Cioculftu’) subaceratus* (Ridley & Dendy, 1886) (Indonesia, ZMA database) (6)
*Amorphinopsis spp.* (Indonesia, ZMA database) (6)
*Amorphinopsis (’Prostyllissa’) foetida* (Dendy, 1889) Pattanayak, 1997 (Nicobar and Andaman Islands) (1)
*Axyxysa (’Pseudaxxysa’) oculeata* (Wilson, 1925) (Philippines, Indonesia, ZMA database) (6,7)
*Axyxysa aplysonoides* (Dendy, 1922) (Indonesia, ZMA database) (6)
*Axyxysa (’Leucophloeus’) fenestratus* (Ridley, 1884); Burton, 1928:127; Dawydoff, 1952 (Bally Strait, Malay Archipelago, 320m; Vietnam, Indonesia, ZMA database) (2,3,6)
*Axyxysa* sp. (Singapore; ZRC) (2)
*Axyxysa (’Leucophloeus’) sp.nov.; Dawydoff, 1952 (Poulo Condore, Vietnam) (3)
*Cioculatptu foetida* (Dendy); Lindgren, 1897: 483; Lindgren, 1898; Dawydoff, 1952 (China Sea, Mergui Archipelago, Poulo Condore, Vietnam) (1,3)
*Cioculatptu melichlorae* Sollas, 1902:214, pl.14, fig.1, pl.15, fig.8 (Pulau Bidang, NE of Penang, 5° 30’N) (2)
*Cioculatptu mitillia* Sollas, 1902:215, pl.14, fig.7 (Pulau Bidang, NE of Penang, 5° 30’N) (2)
Ciocalypta sp. 1286 (Sulawesi, Indonesia) (6, QM/NTM collection)

Ciocalypta sp. (Singapore; QM/ZRC collections) (2)

Collocalypta digitata Dendy, 1905 (Indonesia, ZMA database) (6)

Didiscus antisodicus Vacelet & Vasseur, 1971 (Indonesia, ZMA database) (6, Burton MS)

Didiscus sp. (Indonesia, ZMA database) (6)

Didiscus aceratus (Nha Trang, Vietnam, PIBOC database) (3)

Epipolaxis sulensis Wilson, 1925 (Philippines, Indonesia, ZMA database) (6,7)

Epipolaxis sp. (Indonesia, ZMA database) (6)

Epipolaxis sp. (Nha Trang, Vietnam, PIBOC database) (3)

Halichondria armata Lindgren, 1897: 480; Lindgren, 1898 (China Sea, 20° 5' N) (3)

Halichondria aura Lindgren, 1897: 480; Lindgren, 1898 (Java Sea and Gaspar Straits) (2)

Halichondria berquastii Hooper et al., 1997 (Sulawesi, Indonesia) (6, QM/NTM collection)

Halichondria bivoltata Higgin, 1877; Carter, 1887:72 (King I., Mergui Archipelago, Burma, 12° 08' N) (1)

Halichondria cartilaginea (Esper, 1794) (Indonesia, ZMA database) (6, Burton MS)

Halichondria cl. panicea Johnston, 1842:114; Carter, 1887:69; Wilson, 1925:396; Dawydoff, 1952;

Dmitrenok et al., 1988 (King I., Mergui Archipelago, Burma, 12° 08' N; Philippines; Vietnam) (1,3,7)

Halichondria symbiotica Lévi, 1961: 140 (Vietnam) (3)

Halichondria variabilis Lindgren, 1897: 480; Lindgren 1898; Wilson, 1925:396; Dawydoff, 1952

(Indonesia, ZMA database) (6)

Halichondria tyleri Bowerbank, 1873 (Indonesia, ZMA database) (6)

Halichondria sp. 965 (Phuket region, Thailand) (1, QM/NTM collection)

Halichondria sp. 969 (Ko Samui region, Thailand) (3, QM/NTM collection)

Halichondria sp. 1710 (Kalimantan, Indonesia) (6, QM/NTM collection)

Halichondria sp. 1717 (Kalimantan, Indonesia) (6, QM/NTM collection)

Halichondria sp. (Singapore; ZRC) (2)

Halichondria sp. (Singapore; ZRC) (2)

Halichondria spp. (Singapore; QM/ZRC collections) (2)

Halichondria spp. (Nha Trang, Vietnam, PIBOC database) (3)

Hymeniacidon contolosa (Topsent); Lindgren, 1897: 483; Lindgren, 1898 (Gaspar Straits, Java Sea) (2)

Hymeniacidon fenestratus (Ridley); Lindgren, 1897: 483; Lindgren, 1898 (Vietnam, China Sea, 11° 5' N) (3)

Hymeniacidon heliophila (Parker, 1910:2); Cabrero, 1981:18 (Quezon, South Cotabato, Philippines) (7)

Hymeniacidon "assimilis": Dmitrenok et al., 1988 (Singapore) (2)

Hymeniacidon spp. (Indonesia, ZMA database) (6)

Petromica massalis (Dendy, 1905); Burton, 1928:110; Pattanayak, 1997 (8 mls W of Interview L., Andaman Is, 90-540m, 13°N; Nicobar and Andaman Islands) (1)

Spongiosorites ('Trachyposis') halichondrioides (Dendy, 1905); Burton, 1928:118; Pattanayak, 1997

(Bally Strait, Malay Archipelago; N Sentinel L., Andaman Is, 260-500m, 11° 40' N; Nicobar and Andaman Islands; Philippines) (1,2,7)

Spongiosorites 'orientalis' Burton, unpublished MS name (Indonesia, ZMA database) (6, Burton MS)

Spongiosorites spp. (Phuket region, Thailand) (1, QM/NTM collection)

Spongiosorites sp. 968 (Phuket region, Thailand) (1, QM/NTM collection)

Topsentia armata (Lindgren, 1897) (Indonesia, ZMA database) (6)

Topsentia cavernosa (Topsent, 1897), Desqueyroux-Faunéz, 1981 (Ambon, Indonesia) (6)

Topsentia dura Lindgren, 1897: 481; Lindgren, 1898 (Java Sea) (2)

Topsentia glabra (Keller, 1891) (Indonesia, ZMA database) (6)

Topsentia granulata Keller, 1891 (Indonesia, ZMA database) (6)

Topsentia indica Hentschel, 1912 (Aru Is, Indonesia) (6)

Topsentia salomonensis Dendy, 1905 (Indonesia, ZMA database) (6)

Topsentia variabilis (Lindgren, 1897) (Indonesia, ZMA database) (6)

Topsentia spp. (Indonesia, ZMA database) (6)
Order Haplosclerida

Definition. - Main skeleton is partially or entirely composed of an isodictyclal reticulation of spongin fibres and/or spicules, with uni- to multispheric tracts of diactinal spicules forming triangular, rectangular or polygonal meshes; megascleres are exclusively oxeote or strongylote, bonded together with collagenous spongin or enclosed within spongin fibres; microscleres, if present, may include sigmas (frequently centriangular), smooth toxas or microxeas.

Remarks. - Nine families of sponges are included (five marine and four freshwater, of which seven are viviparous, with parenchymella bearing various patterns of ciliation, one oviparous group (Petrosiidae), and one freshwater family is uncertain (Lubomirskiidae).

Family Callyspongiidae de Laubenfels, 1936

Definition. - Encrusting, massive, vase-shaped, tubular, fan-shaped and branching growth forms; surface characteristically sculptured with conules or ridges, and usually has an optically visible lace-like reticulation of spicules and/or fibres lying tangential to the surface; ectosomal skeleton a two dimensional tangential reticulation of close-set primary, secondary and sometimes tertiary spongin fibres, sparsely cored with small or vestigial oxeas or strongyles; choanosomal skeleton more widely spaced, composed of a reticulation of primary ascending (bi- or multispecific) and secondary connecting spongin fibres (uni- or aspicular), composed of well developed fibres, cored by oxeas or strongyles; spongin characteristically abundant; megascleres sometimes vestigial, with blackened axial canals, absent entirely or replaced by sand grains; microscleres, if present, include only toxas.

SOUTH CHINA SEA SPECIES.

Callyspongia (‘Cladochalina’) aureantiaca (Lendenfeld, 1887); Dragnewitsch, 1906:444 (Singapore, 1° 30’N) (2)

Callyspongia barodenensis Burton, 1959 (Indonesia, ZMA database) (6)

Callyspongia claviformis Kieschnick, 1896 (Ternate, Moluccas, Indonesia) (6)

Callyspongia conficiata (Ridley, 1884); Lévi, 1961: 144 (Vietnam; Indonesia, ZMA database) (3,6)

Callyspongia dendyi Burton, 1931 (Indonesia, ZMA database) (6)

Callyspongia diffusa Ridley, 1884; Lévi, 1961:525 (Indonesia, ZMA database, Zamboanga, Philippines) (6,7)

Callyspongia diffusa Ridley affinis Hentschel, 1912 (Aru Is, Indonesia) (6)

Callyspongia doorae Brøndsted, 1934 (Java, Banda, Indonesia) (6)

Callyspongia elegans Thiele, 1899 (Indonesia, ZMA database) (6)

Callyspongia (Euplaccella) elongata (Ridley & Dendy, 1886) (Indonesia, ZMA database) (6, Burton MS)

Callyspongia erecta Kieschnick, 1900 (Ternate, Moluccas, Indonesia) (6)

Callyspongia (‘Cladochalina’) euphas (Lendenfeld, 1887); Dragnewitsch, 1906:444 (Singapore, 1° 30’N) (2)

Callyspongia cf. fallat Duchassaing & Michelotti, 1864 (Indonesia, ZMA database) (6)

Callyspongia fibrosa (Ridley & Dendy, 1886); Lévi, 1961: 144 (Vietnam; Indonesia, ZMA database) (3,6)

Callyspongia folioides Bowerbank, 1875 (Indonesia, ZMA database) (6)

Callyspongia fragilis Kieschnick, 1900 (Ternate, Moluccas, Indonesia) (6)

Callyspongia globosa Pulitzer-Finali, 1980 (Hong Kong) (5)

Callyspongia joubini Topsent, 1897; Desqueyroux-Faundez, 1981 (Ambon, Indonesia) (6)

Callyspongia “lindgreni” Burton, unpublished MS name (Indonesia, ZMA database) (6, Burton MS)

Callyspongia lobata Brøndsted, 1934 (Java, Banda, Indonesia) (6)

Callyspongia melior Topsent, 1897; Desqueyroux-Faundez, 1981 (Ambon, Indonesia) (6)
**Family Chalinidae Gray, 1867**

**Definition.** - Encrusting, massive, cup-shaped, fan-shaped and branching growth forms, usually with spongy and delicate consistency; when present euctosomal skeleton consists of a special, tangential, unlayered, unispicular, isotrophic reticulation of oxeas bound by nodal spongins; choanosomal skeleton consists of an isodictyal reticulation of uni- or paraispicular primary tracts of oxeas, rarely multispicular, interconnected by uni- or paraispicular secondary tracts, and spicules are bonded together at their nodes of junction by small amounts of collagenous spongins, or they may be fully enclosed within light spongins fibres and form more robust reticulations; microscleres, if present, include only sigmas or toxas; parenchymella larvae are incubated and are completely and uniformly ciliated or have a bare posterior cap fringed by longer cilia.

**SOUTH CHINA SEA SPECIES.**

*Callyspongia mullis* Topsent, 1897; Desqueyroux-Fauvez, 1981 (Ambon, Indonesia) (6)
*Callyspongia monilata* Ridley, 1884; Wilson, 1925:417 (as *Dartrylochalinia exigua samarensis*); Lévi, 1961: 143 (Vietnam; Indonesia, ZMA database; Philippines) (3, 6, 7)
*Callyspongia murata* Ridley, 1884 (Indonesia, ZMA database) (6)
*Callyspongia muriculata* (Ridley, 1884) (Indonesia, ZMA database) (6, Burton MS)
*Callyspongia nuda* Hentschel, 1912 (Aru Is, Indonesia) (6)
*Callyspongia orientalis* Pulitzer-Finali, 1980 (Hong Kong) (5)
*Callyspongia parva* Desqueyroux, 1984 (Indonesia, ZMA database) (6)
*Callyspongia pseudofibrosa* Desqueyroux, 1984 (Indonesia, ZMA database) (6)
*Callyspongia pulverata* (Lindgren, 1897); Lindgren, 1898; van Soest, 1980 (Java, Hong Kong) (2, 5)
*Callyspongia ridleyi* Burton, 1934 (Indonesia, ZMA database) (6)
*Callyspongia robusta* Ridley, 1884 (Indonesia, ZMA database) (6)
*Callyspongia schulzei* Kießwetter, 1900 (Ternate, Moluccas, Indonesia) (6)
*Callyspongia spinifera* Carter, 1886 (Indonesia, ZMA database) (6)
*Callyspongia subarmigera* Ridley, 1884; Lévi, 1961:526 (Indonesia, ZMA database; Zamboanga, Philippines) (6, 7)
*Callyspongia ternatensis* Kießwetter, 1896 (Ternate, Moluccas, Indonesia) (6)
*Callyspongia* (*Euchalinia*) typica (Lendenfeld, 1887); Dragnewitsch, 1906:444 (Singapore, 1°30’-N) (2)
*Callyspongia vaginalis* (Lamarck, 1814); Cabrero, 1979:17; Cabrero, 1981:19 (SE Negros I, Palawan, Pangasinan, Quezon, Batangas, Philippines) (7, QM/NTM collection)
*Callyspongia* sp. (Indonesia, ZMA database) (6)
*Callyspongia* sp. 138 (Sattahip and Phuket regions, Thailand) (1, 3, QM/NTM collection)
*Callyspongia* sp. 938 (Sattahip Navy Base region, Thailand) (3, QM/NTM collection)
*Callyspongia* sp.: George & George, 1987 (Bodgaya Islands and Pulau Sipadan, Sabah) (4)
*Callyspongia* sp. (Singapore; ZRC collections) (2)
*Callyspongia* sp. (Nha Trang, Vietnam; PIBOC database) (3)
*Siphonochalinia crassifibra* Dendy, 1899:82; Wilson, 1925:414 (Philippines) (7)
*Siphonochalinia flexa* Pulitzer-Finali, 1980 (Hong Kong) (5)
*Siphonochalinia truncata* Lindgren, 1897: 481; Lindgren, 1898; Dawydoff, 1952 (Vietnam, China Sea, 11°5’-N) (3)
*Siphonochalinia* sp.: George & George, 1987 (photo 2C) (Bodgaya Islands and Pulau Sipadan, Sabah) (4)

**Family Chalinidae Gray, 1867**

**Definition.** - Encrusting, massive, cup-shaped, fan-shaped and branching growth forms, usually with spongy and delicate consistency; when present euctosomal skeleton consists of a special, tangential, unlayered, unispicular, isotrophic reticulation of oxeas bound by nodal spongins; choanosomal skeleton consists of an isodictyal reticulation of uni- or paraispicular primary tracts of oxeas, rarely multispicular, interconnected by uni- or paraispicular secondary tracts, and spicules are bonded together at their nodes of junction by small amounts of collagenous spongins, or they may be fully enclosed within light spongins fibres and form more robust reticulations; microscleres, if present, include only sigmas or toxas; parenchymella larvae are incubated and are completely and uniformly ciliated or have a bare posterior cap fringed by longer cilia.

**SOUTH CHINA SEA SPECIES.**

*Acervochalinia confusa* Dendy, 1922 (Indonesia, ZMA database) (6)
*Acervochalinia* sp. (Indonesia, ZMA database) (6)
*Chadocore cephalacta* Pulitzer-Finali, 1982 (Indonesia, ZMA database) (6)
*Dendrocerus* sp. (Indonesia, ZMA database) (6)
*Gellius amboinensis* Lévi, 1961: 142 (Vietnam) (3)
*Gellius angulatus* vasiformis Wilson, 1925:367 (Philippines) (7)
*Gellius centrulatus* Sollas, 1902:212, pl.15, fig.6 (Great Redang I, E. coast of Malay Peninsula, 5°50’N) (3)

168
**Gellius fibulata** Schmidt, 1862; Dragnewitsch, 1906:442 (Singapore, 1° 30’N) (2)

**Gellius flagellifer** (Ridley & Dendy, 1886); Burton, 1928:114; Pattanayak, 1997 (Andaman Sea, 13° 15’-59’N, 340-1200m; Nicobar and Andaman Islands) (1)

**Gellius megastoma** (Burton, 1928); Burton, 1932:115, pl.1, fig.1; Pattanayak, 1997 (Andaman Is. 12°N, 260-580m; Nicobar and Andaman Islands) (1)

**Gellius ridleyi** Hentschel; Lévi, 1961:142 (Vietnam, Zambanga, Lingayen Gulf, Philippines) (3, 7)

**Gellius strongylatus** Lindgren, 1887: 481; Lindgren 1898 (Hirudo Straits, China Sea) (3)

**Gellius toxius** Topsent, 1897: Dawydoff, 1952; Pulizer-Finali, 1980 (Vietnam, Cambodia, Malaysia, Hong Kong) (2, 3, 5)

**Gellius sp.** 1018 (Zambanga, Philippines) (7, QM/NTM collection)

**Haliclona ambonensis** Lévi, 1961 (Indonesia, ZMA database) (6)

**Haliclona bandae** Bronsted, 1934 (Java, Banda, Indonesia) (6)

**Haliclona carteri** Burton, 1959 (Indonesia, ZMA database) (6)

**Haliclona cerebrata** Burton, 1928 (Indonesia, ZMA database) (6)

**Haliclona clathrata** Dendy, 1895; Dawydoff, 1952; Cabrero, 1981:17 (Vietnam, Indonesia, ZMA database) (3, 6, 7)

**Haliclona compacta** (Ridley & Dendy, 1886) (Indonesia, ZMA database) (6, Burton MS)

**Haliclona “conoidea”** Burton, unpublished MS name (Indonesia, ZMA database) (6, Burton MS)

**Haliclona craterea** Kieschnick, 1896 (Ternate, Moluccas, Indonesia) (6)

**Haliclona (“Sigmadicia”) cyanaeformis** (Esper, 1794); Van Soest, 1980 (Hong Kong, Indonesia, ZMA database) (5, 6)

**Haliclona delicatula** (Dendy, 1889) (Indonesia, ZMA database) (6, Burton MS)

**Haliclona digitata** Baer, 1906 (Indonesia, ZMA database) (6)

**Haliclona elastica** Kieschnick, 1900 (Ternate, Moluccas, Indonesia) (6)

**Haliclona fascicera** (Hentschel, 1912:398); Wilson, 1925:413 (Aru Is, Indonesia; Philippines) (6, 7)

**Haliclona flabello-digitatus** Burton, 1934; Cabrero, 1981:18 (Batangas, Philippines) (7)

**Haliclona flagellifer** Ridley & Dendy, 1886 (Indonesia, ZMA database) (6)

**Haliclona forcipata** Thiele, 1903 (Indonesia, ZMA database) (6)

**Haliclona glaberrima** Topsent, 1897; Desqueyroux-Faundez, 1981 (Ambon, Indonesia) (6)

**Haliclona hispidula** Topsent, 1897; Desqueyroux-Faundez, 1981 (Ambon, Indonesia) (6)

**Haliclona incrassata** Hentschel, 1912 (Aru Is, Indonesia) (6)

**Haliclona irregularis** Kieschnick, 1896 (Ternate, Moluccas, Indonesia) (6)

**Haliclona jugosa** Bowerbank, 1866 (Indonesia, ZMA database) (6)

**Haliclona koreana** (Dendy, 1895:238); Cabrero, 1981:16 (Mindoro Oriental, Quezon, Batangas, Marinduque, Philippines) (7)

**Haliclona “lieberkuehnii”** Burton, unpublished MS name (Indonesia, ZMA database) (6, Burton MS)

**Haliclona ligulata** (Whitelegge, 1901:74); Cabrero, 1981:18 (Batangas, Philippines) (7)

**Haliclona “longispicularis”** Burton, unpublished MS name (Indonesia, ZMA database) (6, Burton MS)

**Haliclona madrepora** Dendy, 1889 (Indonesia, ZMA database) (6)

**Haliclona microsigna** Dendy, 1916 (Indonesia, ZMA database) (6)

**Haliclona minima** (Lendenfeld, 1889) (Indonesia, ZMA database) (6, Burton MS)

**Haliclona minor** Dendy, 1916 (Indonesia, ZMA database) (6)

**Haliclona mirabilis** (Bowerbank, 1866) (Indonesia, ZMA database) (6, Burton MS)

**Haliclona “montagni”** Bowerbank, 1866 (Indonesia, ZMA database) (6)

**Haliclona nigra** Burton, 1929 (Indonesia, ZMA database) (6)

**Haliclona (“Chalina”) oculata** var. fibrosa (Carter), 1887:66 (King I., Mergui Archipelago, Burma, 12° 08’N) (1)

**Haliclona (“Rhapapisia”) pallida** (Ridley); Su et al., 1996 (South China Sea) (5)

**Haliclona cf. pernolleti** (Bowerbank, 1866:278); Cabrero, 1981:18 (Quezon, South Cotabota, Philippines) (7) [misidentification for a eucapian species]

**Haliclona pigmentifera** Dendy, 1905 (Indonesia, ZMA database) (6)

**Haliclona pulvinar** Topsent, 1897; Desqueyroux-Faundez, 1981 (Ambon, Indonesia) (6)

**Haliclona “rectangularis”** Burton, unpublished MS name (Indonesia, ZMA database) (6, Burton MS)

**Haliclona sexchelensis** Dendy, 1922 (Indonesia, ZMA database) (6)

**Haliclona similis** Topsent, 1897; Desqueyroux-Faundez, 1981 (Ambon, Indonesia) (6)

**Haliclona “siphonella”** Burton, unpublished MS name (Indonesia, ZMA database) (6, Burton MS)

**Haliclona sorongae** Bronsted, 1934 (Java, Banda, Indonesia) (6)

**Haliclona (“Chalina”) spinifera** (Carter, 1887:66, pl.5, figs 1-2) (King I., Mergui Archipelago, Burma, 12° 08’N) (1)
Haliconia subarmigera (Ridley); Lindgren, 1897: 481; Lindgren, 1898; Dawydoft, 1952 (Vietnam, China Sea, 11° 5’N) (3)

Haliconia subcapitata Lévi, 1961:527 (Zamboanga, Philippines) (7)

Haliconia tabernaculata Row, 1911 (Indonesia, ZMA database) (6)

Haliconia tenuiramosa Burton, 1930 (Indonesia, ZMA database) (6)

Haliconia temupeculata Burton, 1934 (Indonesia, ZMA database) (6)

Haliconia toxius Topsent, 1897: Desqueyroux-Faunede, 1981 (Ambon, Indonesia) (6)

Haliconia toxophorius Hentschel, 1912 (Aru Is, Indonesia) (6)

Haliconia toxotes Hentschel, 1912 (Aru Is, Indonesia) (6)

Haliconia varia Bowerbank, 1875 (Indonesia, ZMA database) (6)

Haliconia variabilis (Dendy, 1890:353); Cabreroy, 1981:15 (Batangas, Quezon, Marinduque, Philippines) (7)

Haliconia vasiforme Wilson, 1925 (Philippines, Indonesia, ZMA database) (6,7)

Haliconia venusta Bowerbank, 1875 (Indonesia, ZMA database) (6, Burton MS)

Haliconia violacea de Laubenfels, 1950 (Indonesia, ZMA database) (6)

Haliconia viridenegra Vacelet & Vasseur, 1971 (Indonesia, ZMA database) (6)

Haliconia “weberi” Burton, unpublished MS name (Indonesia, ZMA database) (6, Burton MS)

Haliconia zambouanga Lévi, 1961:527 (Zamboanga, Philippines) (7)

Haliconia (‘Adociu’) sp. 950 (Phuket region Thailand) (1, QM/NTM collection)

Haliconia (‘Adociu’) sp. 967 (Phuket region Thailand) (1, QM/NTM collection)

Haliconia (‘Adociu’) sp.: Lévi, 1961:528 (Zamboanga, Philippines) (7)

Haliconia sp.: Zeng et al., 1995b,c (South China Sea) (5)

Haliconia spp. (Indonesia, ZMA database) (6)

Haliconia sp. 937 (Sattahip region, Thailand) (3, QM/NTM collection)

Haliconia sp. 945 (Phuket and Ko Samui regions Thailand) (1,3, QM/NTM collection)

Haliconia sp.: George & George, 1987 (Bodgaya Islands and Pulau Sipadan, Sabah) (4)

Haliconia sp.: Lévi, 1961:145 (Vietnam) (3)

Haliconia sp.: Lévi, 1961:145 (Vietnam) (3)

Haliconia sp. 1022 (Negros Oriental, Philippines) (7, QM/NTM collection)

Haliconia sp. 1031 (SW, Cebu I., Philippines) (7, QM/NTM collection)

Haliconia sp. 1705 (Kalimantan, Indonesia) (6, QM/NTM collection)

Haliconia spp. (Singapore, QM/ZRC collections) (2)

Haliconia spp. (Nha Trang, Vietnam, PIBOC database) (3)

Haliconia (‘Sigmadocia’) sp. 49 (Phuket and Ko Samui regions Thailand) (1,3, QM/NTM collection)

Reniera aquaeductus Schmidt infundibularis Ridley & Dendy; Lindgren, 1897: 481; Lindgren, 1898 (Edam, Java) (2)

Reniera australis Lendenfeld, 1888; Dragneuwitsch, 1906:443 (Singapore, 1° 30’N) (2)

Reniera baerii (Wilson, 1925); de Laubenfels, 1935; Pulitzer-Finali, 1980 (Philippines; Indonesia; Hong Kong) (5,6,7)

Reniera camerata Ridley, 1884; Dawydoft, 1952 (Vietnam, Cambodia; Indonesia, ZMA database) (3,6)

Reniera cinerea (Grant) (Indonesia, ZMA database) (6)

Reniera crateriformis Carter, 1882; Carter, 1887:71 (King I., Mergui Archipelago, Burma, 12° 08’N) (1)

Reniera cribriformis (Ridley, 1884); Dawydoft, 1952 (Vietnam; Indonesia, ZMA database) (3,6)

Reniera devidae (Topsent, 1906b); Dawydoft, 1952 (Vietnam; Indonesia, ZMA database) (3,6)

Reniera fistulosa (Bowerbank, 1866); Dawydoft, 1952 (Vietnam; Indonesia, ZMA database) (3,6)

Reniera implexa Schmidt, 1868; Dragneuwitsch, 1906:443 (Singapore, 1° 30’N) (2)

Reniera madreporea Dendy; Lindgren, 1897: 481; Lindgren, 1898; Dawydoft, 1952 (Java; Vietnam) (2,3)

Reniera rosea (Bowerbank, 1866); Dawydoft, 1952 (Vietnam; Indonesia, ZMA database) (3,6)

Reniera scyphanoideas (Lamarck); Lindgren, 1897: 481; Lindgren, 1898; Dawydoft, 1952 (S of Amoy, China Sea; Vietnam) (3)

Reniera sp.: Sollas 1902;210, pl.14, fig.5 (Pulau Bidang, NE of Penang, 5° 30’N) (2)

Reniera sp.: Sollas 1902;210, pl.15, fig.11 (Great Redang I., E coast of Malay Peninsula, 5° 50’N) (3)

Reniera sp.: Sollas 1902;211 (Pulau Bidang, NE of Penang, 5° 30’N) (2)

Reniera sp.: Sollas 1902;211 (Pulau Bidang, NE of Penang, 5° 30’N) (2)

Reniera sp.: Sollas 1902;211, pl.15, fig.3 (Pulau Bidang, NE of Penang, 5° 30’N) (2)
**Family Niphatidae Van Soest, 1980**

**Definition.** - Encrusting, massive, fan-shaped, vase-shaped and branching growth forms, often with chimney-like oscular processes; ectsosomal skeleton consists of a dense multispicular, three-dimensional, paratangential reticulation of diactinial spicules (oxeas or strongyles), usually more compact than the choanosomal skeleton; erect spicule brushes characteristically at the surface; choanosomal skeleton a reticulation of ascending and transverse-connecting spongin fibres, cored by multispicular tracts of oxeas; interstitial spicules also common; microscleres, if present, are sigmas or microxeas.

**SOUTH CHINA SEA SPECIES.**

*Antipathes* (*Pugetia*?) *citrinula* (Lindgren, 1897; Dragnewitsch, 1906; Wilson, 1925; Dawydoif, 1952) (Singapore, 1° 30'N) (2)

*Antipathes* (*Pugetia*?) *negulorrhaphis* (Ridley & Dendy, 1886) (Singapore, 1° 30'N) (3)

*Antipathes* (*Pugetia*?) *sp.;* Zeng et al., 1996 (South China Sea) (5)

*Antipathes* spp. (Nha Trang, Vietnam, PIBOC database) (3)

*Cribrochalinia chuenensis* Pulitzer-Finali, 1980 (Hong Kong) (5)

*Cribrochalinia korenella* (de Laubenfels, 1954) (Singapore; ZRC) (2)

*Cribrochalinia olemda* (de Laubenfels, 1954) (Kalimantan, Indonesia) (6, QM/NTM collection)

*Cribrochalinia* sp. 1023 (SW. Cebu I., Philippines) (7, QM/NTM collection)

*Cribrochalinia* sp. 1025 (Negros Oriental, SW. Cebu I., Philippines) (7, QM/NTM collection)

*Cribrochalinia* sp. 792 (Negros Oriental, Philippines) (7, QM/NTM collection)

*Cribrochalinia* sp.; George & George, 1987 (Bodgaya Islands and Pulau Sipadan, Sabah) (4)

*Cribrochalinia* sp.; George & George, 1987 (photo 3F) (Bodgaya Islands and Pulau Sipadan, Sabah) (4)

*Cribrochalinia* sp. (Singapore; ZRC) (2)

*Cribrochalinia* sp. (Singapore; ZRC) (2)

*Cribrochalinia* sp. (Singapore; ZRC) (2)

*Gelliodes callista* de Laubenfels; Lévi, 1961: 141 (Vietnam) (3)
**Family Phloeodictyidae Carter, 1882**

**Definition.** - Encrusting, massive, lobate, or more frequently spherical and tubular growth forms buried in the substrate, usually with fistules on upper surface bearing apical oscules, occasionally excavating coralline substrates; ectosomal skeleton multilayered, irregular, tangential reticulation of diactinal spicules (oxeas or strongyles), forming a distinct, usually detachable, parchment-like crust; choanosomal skeleton an irregular reticulation of diactinal spicules forming multispicular tracts, typically producing a pulpy effect, with or without spongine fibres, together with an irregularly dispersed isotropic reticulation of single spicules scattered between these major tracts; microscleres may include centrangular sigmas and toxas.

**SOUTH CHINA SEA SPECIES.**

*Calyx clavata* (Burton, 1928:117); Pattanayak, 1997 (off Cinque L., Andaman Is. 240-340m, 11° 25’N; Nicobar and Andaman Islands) (1)

*Calyx (‘Vagocia’) imperialis* (Dendy, 1922) (Indonesia, ZMA database) (6)

*Oceanapita amboinensis* Topsent, 1897; Desqueyroux-Faundez, 1981 (Ambon, Indonesia) (6)

*Oceanapita (‘Phloeodictyon’) cagayanense* (Wilson, 1925:420) (Philippines; Indonesia, ZMA database) (6,7)

*Oceanapita crassispicula* Kieschnick, 1896 (Ternate, Moluccas, Indonesia) (6)

*Oceanapita dura* Vacelet & Vasseur, 1971 (Indonesia, ZMA database) (6)

*Oceanapita elastica* Keller, 1891 (Indonesia; ZMA database) (6)

*Oceanapita eusiphonia* (Ridley, 1884) (Indonesia, ZMA database) (6, Burton MS)
**Oceania** *incrustata* Dendy, 1922 (Indonesia, ZMA database) (6)

*Oceania* (*Phloeodictyon*) *cf. isodictyiforme* (Carter, 1882); Carter, 1887:69 (King L., Mergui Archipelago, Burma. 12° 08'N) (1) [misidentification for a European species]

*Oceania fragilis* Topsent, 1897; Desqueyroux-Faunède, 1981 (Ambon, Indonesia) (6)

*Oceania media* Thiele, 1900 (Indonesia, ZMA database) (6)

*Oceania mollis* (Dendy, 1895) (Indonesia, ZMA database) (6, Burton MS)

*Oceania pellucida* (Ridley, 1884) (Indonesia, ZMA database) (6, Burton MS)

*Oceania* "petrosia" Burton, unpublished MS name (Indonesia, ZMA database) (6, Burton MS)

*Oceania polysiphonia* Dendy, 1922 (Indonesia, ZMA database) (6)

*Oceania* (*Phloeodictyon*) *putridum* (Lamarck); Wilson, 1925:419 (Philippines) (7)

*Oceania ramsayi* (Lendenfeld); George & George, 1987 (photo) (Bodgaya Islands and Pulau Sipadan, Sabah) (4)

*Oceania renieroides* Burton, 1934 (Indonesia, ZMA database) (6)

*Oceania sagittaria* (Sollas, 1902:212); Hooper, Kelly-Borges & Riddle, 1993 (Pulau Bidang, NE of Penang, 5° 30'N; AIMS/NCI collection, Ko Samui region, Thailand (QM/NTM collections); Singapore (QM/ZRC collections) (2,3)

*Oceania toxiophila* Dendy, 1922 (Indonesia, ZMA database) (6)

*Oceania tuberosa* Dendy, 1922 (Indonesia, ZMA database) (6)

*Oceania zoologica* Dendy, 1905 (Indonesia, ZMA database) (6)

*Oceania* spp. (Indonesia, ZMA database) (6)

*Oceania* sp. 1712 (Kalimantan, Indonesia) (6, QM/NTM collection)

*Oceania* sp. 618 (Kalimantan, Indonesia) (6, QM/NTM collection)

*Oceania* spp. (Singapore; QM/ZRC collections) (2)

*Oceania* (*Pachypellina*) *fibrosa gracilis* (Wilson, 1925:412) (Philippines) (7)

*Pellina integrata* Topsent, 1897; Desqueyroux-Faunède, 1981 (Ambon, Indonesia) (6)

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**Family Petrosiidae van Soest 1980**

**Definition.** - Typically massive, vase-shaped or volcano-shaped sponges, sometimes encrusting, bulbous, and less commonly branching growth forms; texture characteristically stony, brittle, reflecting that in most species siliceous spicules are clearly dominant over spongian; ectosomal skeleton an isotropic reticulation of single spicules or spicule tracts forming a crust, giving the surface a smooth appearance; choanosomal skeleton more or less a regular isotropic reticulation of multispiracular tracts, without distinction between primary or secondary tracts, bound together with minimal spongian, forming oval meshes; microscleres may include microxeas and microstrongyles; reproduction oviparous.

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**SOUTH CHINA SEA SPECIES.**

*Acroupetrosia* *grandis* Hooper, 1985 (Indonesia, ZMA database) (6)

*Petrosia* *chaliniformis* Thiele, 1899 (Indonesia, ZMA database) (6)

*Petrosia* *contigua* Thiele, 1899 (Indonesia, ZMA database) (6)

*Petrosia* *cristata* Wilson, 1925:408 (Philippines) (7)

*Petrosia* *denseissima* Dendy, 1905 (Indonesia, ZMA database) (6)

*Petrosia* *dura* (Nardo); Dawydoff, 1952 (Vietnam, Cambodia) (3)

*Petrosia* *elastica* (Keller); Lindgren, 1897: 480; Lindgren, 1898; Dawydoff, 1952 (Gaspar Straits, Java; Vietnam) (2,3)

*Petrosia* *ficiiformis* Olivi, 1791 (Indonesia, ZMA database) (6)

*Petrosia* *expansa* Thiele, 1903 (Indonesia, ZMA database) (6)

*Petrosia* *expansa* Thiele *arunensis* Hentschel, 1912 (Aru Is, Indonesia) (6)

*Petrosia* *hebes* (Lendenfeld, 1890) (Indonesia, ZMA database) (6)

*Petrosia* *ingen* Thiele, 1899 (Indonesia, ZMA database) (6)

*Petrosia* *lignosa* Wilson, 1925:403 (Philippines) (7)

*Petrosia* *microcea* Vacelet, Vasseur & Lévi, 1976 (Indonesia, ZMA database) (6)

*Petrosia* *nigrigens* Lindgren, 1897: 480; Lindgren, 1898 (Java) (2)

*Petrosia* *pulvella* Thiele, 1899 (Indonesia, ZMA database) (6)

*Petrosia* *rava* Thiele, 1899 (Indonesia, ZMA database) (6)
**Order Dictyoceratida**

**Definition.** - “Keratose sponges” lacking mineral spicules, although detritus and contaminating spicules may be acquired; sponges usually tough, difficult to tear, and frequently with differences in pigmentation between the surface and subectosomal regions; main skeleton a reticulation of spongin fibres, often organised into primary, secondary and sometimes tertiary networks; fibres usually homogenous or lightly laminated in cross-section, with or without central pith, and collagenous spongin filaments may be scattered within the mesohyl; larvae are large, incubated parenchymella, evenly covered with short cilia except
at one pole where tufts of large flagella occur, and both poles have rings of pigmented cilium-free cells.

**Remarks.** - Four families are included in the dictyoceratids, differentiated by their fibre characteristics, although there is currently some debate about whether Dysideidae should be included here or with the Dendroceratida (based on affinities inferred by comparative choanosomal ultrastructures and supporting chemical evidence for affinities to dendroceratids).

**Family Dysideidae Gray, 1867**

**Definition.** - Encrusting, massive or branching growth forms, typically with conulose surface; surface conulose developed to various degrees, often characteristically sculptured by tangential sponggin fibres cored by sand, giving it a delicate lace-like appearance; texture usually soft and compressible, sometimes brittle due to interstitial detritus; choanosome a wide reticulation of sponggin fibres, concentrically stratified although to varying degrees; fibres laminated and cored by a central pith, but this may be obscured by abundant detritus which is frequently incorporated into the sponggin fibres; mesohyl contains only light collagen; choanocyte chambers are large and eurypylous.

**SOUTH CHINA SEA SPECIES.**

*Dysidea arenarios* Bergquist, 1965 (Indonesia, ZMA database) (6)

*Dysidea cinerea* Keller, 1889; van Soest, 1980 (Indonesia, ZMA database, Hong Kong) (5,6)

*Dysidea elastica* Brondsted, 1934 (Java, Banda, Indonesia) (6)

*Dysidea ('Spongelià') elastica* (Schulze), var. *massa* Schulze, 1879; Dragnewitsch, 1906:443 (Singapore, 1° 30’N) (2)

*Dysidea fragilis* (Montagu, 1819); Dawydoff, 1952 (South and Central Annam, Poulo Dama, Vietnam); Cabrera, 1979:16; Cabrera, 1981:12 (Indonesia, ZMA database; Quezon, Philippines); Su et al., 1993a, 1995a,b; Zhong et al., 1993 (South China Sea, Taiwan) (3,5,6,7)

*Dysidea ('Spongelià') fragilis* Schulze, var. *fasciculata* (Wilson, 1925:476) (Philippines) (7)

*Dysidea ('Spongelià') fragilis* Schulze, var. *tubulosa* (Schulze, 1879); Dragnewitsch, 1906:442 (Singapore, 1° 30’N) (2)

*Dysidea granulosa* Bergquist, 1965 (Indonesia, ZMA database) (6)

*Dysidea herbacea* (Davydoff, 1889); Dawydoff, 1952 (South and Central Annam, Poulo Dama, Vietnam); George & George, 1987 (Bodgaya Islands and Pulau Sipadan, Sabah); Pinder, 1992 (South China Sea (Indonesia, ZMA database) (3,4,5,6)

*Dysidea ('Spongelià') pallidiceps* (Keller, 1889); Dawydoff, 1952 (South Annam, Vietnam) (3)

*Dysidea ramosoglomerata* Carter, 1887:64 (mud flats, King I., Mergui Archipelago, Burma, 12° 08’N) (1)

*Dysidea ramosoglomerata* var. *ramonihulata* Carter, 1887:65 (King I., Mergui Archipelago, Burma, 12° 08’N) (1)

*Dysidea ramosoglomerata* var. *granulata* Carter, 1881; Carter, 1887:65 (King I., Mergui Archipelago, Burma, 12° 08’N) (1)

*Dysidea reticulata* Thiele, 1899 (Indonesia, ZMA database) (6)

*Dysidea sp.: Zhong et al., 1992 (South China Sea) (5)

*Dysidea sp.: Su et al., 1993b (South China Sea) (5)

*Dysidea sp.: 16 (Phuket region, Thailand) (1, QM/NTM collection)

*Dysidea sp. 229 (Sattahip and Phuket regions Thailand) (1,3, QM/NTM collection)

*Dysidea sp. 940 (Sattahip region, Thailand) (3, QM/NTM collection)

*Dysidea sp. (Indonesia, ZMA database) (6)

*Dysidea sp. 1709 (Kalimantan, Indonesia) (6, QM/NTM collection)

*Dysidea spp. (Singapore; QM/ZRC collections) (2)

*Euryspongea lobata* Bergquist, 1965 (Indonesia, ZMA database) (6)

*Euryspongea sp. (Indonesia, ZMA database) (6)

*Spongionella ('Spongelià') monoprotax* (Lévi, 1961: 145) (Vietnam) (3)

*Spongionella spp. (Singapore; QM/ZRC collections) (2)
Family Ircinidae Gray, 1867

**Definition.** - Massive, lobate, spherical, digitate, cup shaped, encrusting growth forms, always with a conulose surface, except in forms with an organised superficial sand crust where conules may be reduced to mammiform protruberances; fibres making up anastomosing skeleton laminated in cross section with a central pith region, often obscured by large quantities of debris incorporated into fibres and interstitially; skeleton irregularly arranged; primary fibres always fasciculate, often forming very complex arrays; secondary fibres generally uncored; a third element consists of fine collagen filaments dispersed in wavy tangled tracts throughout the mesohyl; filaments have terminal knobs, sometimes studded with lepidocrocite granules, composed of collagen distinct from that found in the mesohyl matrix or in the fibres; presence of filaments makes the sponge very tough, almost impossible to tear; choanocyte chambers spherical and diploidal; mesohyl only lightly infiltrated with collagen (like the Spongiiidae).

**SOUTH CHINA SEA SPECIES.**

*Ircinia anomala* Dendy, 1905 (Indonesia, ZMA database) (6, Burton MS)

*Ircinia arenensis* Hentschel, 1912 (Aru Is, Indonesia) (6)

*Ircinia atravirens* Burton, unpublished MS name (Indonesia, ZMA database) (6, Burton MS)

*Ircinia elwesi* (Ridley, 1884); Dawydoff, 1952 (Vietnam, Cambodia) (3)

*Ircinia coelestis* Lendenfeld, 1889 (Indonesia, ZMA database) (6, Burton MS)

*Ircinia conulosa* Lendenfeld, 1889 (Indonesia, ZMA database) (6, Burton MS)

*Ircinia dendroides* Poljéauff, 1884; Lévi, 1961:531 (Indonesia, ZMA database; Palawan, Philippines) (6,7)

*Ircinia dendroides* *"dura"* Burton, unpublished MS name (Indonesia, ZMA database) (6, Burton MS)

*Ircinia echinate* Keller, 1889 (Indonesia, ZMA database) (6)

*Ircinia fasciata* (Pallas,1766:361); Caberoy, 1981 (Kalayangi, Pitogo, Quezon, Zamboanga, Pangasinan, Batangas, Masbate, Philippines) (7)

*Ircinia fusca* Carter, 1880 (Indonesia, ZMA database) (6)

*Ircinia "grosso"* Burton, unpublished MS name (Indonesia, ZMA database) (6, Burton MS)

*Ircinia mutans* Wilson, 1925:491 (Philippines) (7)

*Ircinia pilina* Hentschel, 1912; van Soest, 1980 (Indonesia, Hong Kong) (5,6)

*Ircinia ramodigitata* Burton, 1934 (Indonesia, ZMA database) (6)

*Ircinia ramosa* (Keller, 1889); George & George, 1987 (Bodgaya Islands and Pulau Sipadan, Sabah; Indonesia, ZMA database) (4,6)

*Ircinia schulzei* Dendy, 1905 (Indonesia, ZMA database) (6)

*Ircinia simuliceps* (Sollas); Dawydoff, 1952 (Vietnam, Cambodia) (3)

*Ircinia speculosa* Hentschel, 1912 (Aru Is, Indonesia) (6)

*Ircinia tuberosa* Dendy, 1905 (Indonesia, ZMA database) (6, Burton MS)

*Ircinia variabilis* (Schmidt); Wilson, 1925:494; Dawydoff, 1952 (Philippines, Vietnam, Cambodia) (3,7)

*Ircinia spp.* (Indonesia, ZMA database) (6)

*Ircinia (Hircinia)* sp.; Carter, 1887:63 (King I, Mergui Archipelago, Burma, 12° 08’N) (1)

*Ircinia* sp. 1 (Phuket region, Thailand) (1, QM/NTM collection)

*Ircinia* sp. (Singapore: ZRC collections) (2)

*Ircinia* sp. (Singapore: QM/ZRC collections) (2)

*Ircinia* sp. (Nha Trang, Vietnam, PIBOC database) (3)

*Psammocinia arenosa* Lendenfeld, 1889 (Indonesia, ZMA database) (6, Burton MS)

*Psammocinia “ragiosa”* Burton, unpublished MS name (Indonesia, ZMA database) (6, Burton MS)

*Psammocinia* sp. (Singapore: ZRC) (2)

*Sarcotragus* ("Stenospongia") *aligera* (Burton, 1928:135, pl.2, fig.6) (W of Mergui Archipelago, 13° 04’N, 130m) (1)
Family Thorectidae Bergquist, 1978

**Definition.** - Sponge body often tubular organised around a series of long cylindrical canals, and stalked; yellowish or brick-red internal pigmentation with dark exterior common; surface often armoured in complex fashion, frequently thrown into ridges and hollows; where unarmoured the surface is conulose and may resemble Spongiidae; spongin fibres making up the anastomosing skeleton are laminated in cross-section, with clear zones of disjunction between successive layers; central region with more diffuse pith, not sharply disjunct from the investing more dense layer (as is the pith in Verongida), but merges into the outer layer; pith always evident in the primary fibres and may or may not extend into the secondary elements of the skeleton; fibres often extremely regular with almost perfectly rectangular meshes; some fibres extremely stout; primary fibres may be greatly reduced in number, absent in one genus; choanocyte chambers spherical and diploidal.

**South China Sea Species.**

- *Aplysinopsis elegans* Lendenfeld, 1885 (Indonesia, ZMA database) (6)
- *Cacospongia* sp. (Indonesia, ZMA database) (6)
- *Cacospongia* sp.: Carter, 1887:64 (King L., Mergui Archipelago, Burma, 12° 08′N) (1)
- *Fasciplysinopsis reticulata* Hentschel, 1912 (Aru Is, Indonesia) (6)
- *Fasciospongia cava* Hentschel, 1912 (Aru Is, Indonesia) (6)
- *Fasciospongia cupul distelloides* Hentschel, 1912 (Aru Is, Indonesia) (6)
- *Fasciospongia pulcherrima* (Ridley, 1884); Dawydoff, 1952 (Paracels Archipelago, Spratly Is, Macclesfield, Atoll de Tizard) (3)
- *Fasciospongia ('Stelospongia') sp.; Sollas, 1902:220 (Great Redang Is., E. coast of Malay Peninsula, 5° 50′N) (3)
- *Hyrtios elegans* Thiele, 1899 (Indonesia, ZMA database) (6)
- *Hyrtios erecta* (Keller, 1889); Dawydoff, 1952 (Poulo Condore; Réam, Vietnam; Indonesia, ZMA database) (3,6)
- *Hyrtios* sp. (Indonesia, ZMA database) (6)
- *Hyrtios* sp. 796 (Phuket region, Thailand) (1, QM/NTM collection)
- *Luffariella geometrica* Kirkpatrick, 1900 (Phuket region, Thailand) (1, QM/NTM collection)
- *Luffariella variabilis* Poli, 1884 (Indonesia, ZMA database) (6)
- *Luffariella herdmanni* (Dendy, 1905) (Indonesia, ZMA database) (6, Burton MS)
- *Simenospongia* spp. (Indonesia, ZMA database) (6)
- *Thorectia* sp. 957 (Phuket region, Thailand) (1, QM/NTM collection)

Family Spongiidae Gray, 1867

**Definition.** - Encrusting, massive, cup-shaped and branching sponges, including the commercial ‘bath-sponges’; surface typically conulose or with a distinct sand cortex; texture compressible, fibrous, resilient except where heavily sand encrusted, and interior is rough to touch reflecting the density of spongin skeleton in relation to soft tissue; choanosomal skeleton consists of reticulate spongin fibres, usually organised into a hierarchy of sizes; the primary elements are reduced in some genera and completely absent in one; fibres homogenous in cross section, showing no tendency to fracture around planes of concentric lamination, lacking a central pith but often incorporating detritus and foreign spicules into the spongin skeleton; choanocyte chambers small and diploidal.

**South China Sea Species.**

- *Carteriospongia “flabelliformis”* Burton, unpublished MS name (Indonesia, ZMA database) (6, Burton MS)
- *Carteriospongia foliascens* (Pallas, 1766); Caberoy, 1979:15; Caberoy, 1981:8; Dawydoff, 1952 (Indonesia, ZMA database; Philippines; Vietnam, Cambodia) (3,6,7)
Hooper et al.: Sponges of the South China Sea

Carteriospongia otahitica Ehlers; Dawydoff, 1952 (Paracels Archipelago, Spratly Is, Macclesfield, Atoll de Tizard) (3)
Carteriospongia penmata (Lamarck, 1814) (Indonesia, ZMA database) (6)
Carteriospongia radiata (Hyatt, 1877); Lévi, 1961:530 (Indonesia, ZMA database; Zamboanga, Philippines) (6,7)
Carteriospongia robusta (Keller, 1889) (Indonesia, ZMA database) (6, Burton MS)
Carteriospongia siticentra Lendenfeld, 1885 (Indonesia, ZMA database) (6)
Carteriospongia supraevoluta (Lendenfeld, 1889) (Indonesia, ZMA database) (6, Burton MS)
Carteriospongia sp. (Indonesia, ZMA database) (6)
Coscinodiscus sp. (Indonesia, ZMA database) (6)

Dactylotillospora elegans Thiele, 1899; Lopez et al., 1994 (Indonesia, ZMA database; South China Sea; Singapore; ZRC) (2,5,6)
Dactylotillospora sp. (Singapore; ZRC) (2)

Hippospongia cerebrum (Manila region, Philippines) (7, QM/NTM collection)

Hippospongia fisticosa Lendenfeld, 1889; Lévi, 1961:529 (Zamboanga, Philippines) (7)

Hippospongia mollissima Lendenfeld, 1889; Dragnewitsch, 1906:446 (Singapore, 1° 30’N) (2)

Hippospongia sp. (Indonesia, ZMA database) (6)

Hyattella clathrata (Carter, 1881) (Indonesia, ZMA database) (6)

Hyattella intestinalis (Lamarck 1814) (Phuket region, Thailand; AIMS/NCI collection; Indonesia, ZMA database) (1,6, QM/NTM collection)

Hyattella sp. 398 (Bohol Sea, Philippines) (7, QM/NTM collection)

Hyattella sp. (Singapore; QM/ZRC collections) (2)

Phyllophagina alba Wilson, 1925:481 (Philippines) (7)

Phyllophagina coriacea Thiele, 1899, 1901:12 (Indonesia, ZMA database) (6)

Phyllophagina dendri Lendenfeld, 1885 (Indonesia, ZMA database) (6)

Phyllophagina ecoruscata Lévi, 1961:530 (Zamboanga, Philippines) (7)

Phyllophagina folicascens (Pallas, 1766:395); Pattanayak, 1997 (Nicobar and Andaman Islands); George & George, 1987 (Boodyga Islands and Pulau Sipadan, Sabah; SW. Cebu, Manila region, Philippines); Zeng et al., 1991a,d; Fu et al., 1991a,c, 1992a,b; Fu et al., 1993a,b; Su et al., 1995a (South China Sea, Taiwan) (1,4,5,7)

Phyllophagina palustra Thiele, 1899 (Indonesia, ZMA database) (6)

Phyllophagina papuacea (Esper, 1794); Lévi, 1961:530 (Indonesia, ZMA database; Zamboanga Norte, Philippines) (6,7, QM/NTM collection)

Phyllophagina vermicularis Lendenfeld, 1885 (Indonesia, ZMA database) (6)

Phyllophagina sp.; Wan et al., 1996 (South China Sea) (5)

Phyllophagina spp.; Dawydoff, 1952 (Paracels Archipelago, Spratly Is, Macclesfield, Atoll de Tizard; Vietnam, Cambodia) (3)

Spongia ceylonensis Dendy, 1905; van Soest, 1980 (Hong Kong, Indonesia, ZMA database) (5,6)

Spongia digitata Sollas, 1902:220, pl.14, fig.4, pl.15, fig.2 (Great Redang L. E. coast of Malay Peninsula, 5° 50’N) (3)

Spongia cf. equina (Schmidt); Dawydoff, 1952 (Vietnam, Cambodia) (3)

Spongia irregularis Lendenfeld, 1885; Dawydoff, 1952 (Indonesia, ZMA database; Vietnam, Cambodia) (3,6)

Spongia irregularis mollior Topsent, 1897; Desquenroux-Faudern, 1981 (Ambon, Indonesia) (6)

Spongia ('Euspongia') irregularis var. surijangensis (Wilson, 1925:486) (Philippines) (7)

Spongia irregularis villosa Hentschel, 1912 (Aru Is, Indonesia) (6)

Spongia nardorus Lendenfeld, 1885 (Indonesia, ZMA database) (6)

Spongia officinalis Linnaeus, 1794; Carter, 1887:63; Wilson, 1925:484; Lévi, 1967:529; Caberoy, 1979:14; Caberoy, 1981:7 (King L, Mergui Archipelago, Burma, 12° 08’N; Phuket region, Thailand; Negros Orientale, Mindanao, Sulu, Philippines; Indonesia, ZMA database) (1,6,7, QM/NTM collection)

Spongia officinalis var. adriatica Schulze, 1879; Dragnewitsch, 1906:445 (Singapore, 1° 30’N) (2)

Spongia officinalis var. rotunda (Hyatt, 1877); Sollas, 1902:220; Dragnewitsch, 1906:445 (Great Redang L. E coast of Malay Peninsula, 5° 50’N; Singapore, 1° 30’N) (2,3)

Spongia cf. officinalis (Lamarck); Dawydoff, 1952 (Vietnam, Cambodia) (3)

Spongia tubulifera Lamarck, 1814 (Indonesia, ZMA database) (6)

Spongia zimocca Schmidt, 1862; Dragnewitsch, 1906:445 (Singapore, 1° 30’N) (2)

Spongia sp.; Utikina & Veselova, 1990 (South China Sea) (5)

Spongia sp. 262 (Phuket region, Thailand) (1, QM/NTM collection)

Spongia sp. 1711 (Kalimantan, Indonesia) (6, QM/NTM collection)

Spongia spp. (Nha Trang, Vietnam; PIBOC database) (3)
Order Dendroceratida

**Definition.** - “Keratose sponges”, without mineral spicules, with dendritic or reticulate skeleton, and fibres originate from a basal plate, without any obvious differences between primary and secondary spongin fibre elements; fibres are strongly laminated, with distinct pith; larvae are incubated parenchymella, evenly ciliated, with or without a posterior tuft of long flagella.

**Remarks.** - Three families are traditionally included here, distinguished by their respective fibre development and skeleton arrangement.

Family Darwinellidae Merejkowsky, 1879

**Definition.** - Encrusting, massive, lobate, lamellate and erect columnar growth forms; choanosomal fibre skeleton, where present, is completely dendritic and sometimes supplemented by spongin spicules not attached to the primary skeleton; in massive species these fibres always arise from a flat basal spongin plate; one genus lacks spongin fibres but has the ectsosome reinforced with collagenous fibrils; fibres have laminated bark surrounding the central pith; the pith is usually well developed but in 1 genus it is replaced by detritus; choanocytes chambers are eurypylous.

SOUTH CHINA SEA SPECIES.

*Aplysilla cf. rosea* Barrois, 1876; Dawydoff, 1952 (Vietnam, Cambodia; Indonesia, ZMA database) (3,6)

*Aplysilla sulfurea* Schulze, 1878:404; Cabrero, 1981:13 (Tabayas Bay, Batangas, Quezon, Marinduque, Philippines) (7)

*Aplysilla* sp. (Indonesia, ZMA database) (6) (Indonesia, ZMA database) (6)

*Aplysilla* sp. 1714 (Kalimantan, Indonesia) (6, QM/NTM collection)

*Chelonaplysilla cf. betinensis* Zea & van Soest, 1986

*Chelonaplysilla erecta* Keller, 1889 (Indonesia, ZMA database) (6)

*Chelonaplysilla novaeus* (Carter, 1876); Lévi, 1961: 147 (Vietnam; Indonesia, ZMA database) (3,6)

*Darwinella australiensis* Carter, 1885 (Indonesia, ZMA database) (6)

*Darwinella* sp. 1030 (Negros Oriental, Philippines) (7, QM/NTM collection)

*Dendrilla lucuosa* Hentschel, 1912 (Aru Is, Indonesia) (6)

*Dendrilla lendenfeldi* Hentschel, 1912 (Aru Is, Indonesia) (6)

*Dendrilla membranosa* (Pallas); Dawydoff, 1952 (Vietnam, Cambodia) (3)

*Dendrilla mertoni* Hentschel, 1912 (Aru Is, Indonesia) (6)

*Dendrilla rosea digitata* Brondsted, 1934 (Java, Banda, Indonesia) (6)

*Dendrilla rosea typica* Hentschel, 1912 (Aru Is, Indonesia) (6)

*Dendrilla* sp.; George & George, 1987 (Bodgaya Islands and Pulau Sipadan, Sabah) (4)

*Dendrilla* sp. 1716 (Kalimantan, Indonesia) (6, QM/NTM collection)

*Dendrilla* sp. 221 (Phuket region Thailand) (1, QM/NTM collection)

*Dendrilla* sp.; Dawydoff, 1952 (Paracels Archipelago, Spratly Is, Macelesfield Is, Atoll de Tizard) (3)

*Hexadella indica* Dendy, 1905 (Indonesia, ZMA database) (6)

*Hexadella purpurea* Burton, 1937 (Indonesia, ZMA database) (6)

*Hexadella* sp. (Indonesia, ZMA database) (6)

*Pleraplysilla australiensis* Hentschel, 1912 (Aru Is, Indonesia) (6)

*Pleraplysilla* sp.; George & George, 1987 (Bodgaya Islands and Pulau Sipadan, Sabah) (4)
**Family Dictyodendrillidae Bergquist, 1980**

*Definition.* - Growth form varies from spreading with digitate projections, to lobate or stalked forms; texture is delicate and cavernous; choanosomal skeleton has prominently reticulate spongín fibres which may be augmented by incorporation of free spongín spicules in one genus; fibres often dark purple, red, or black, and contrasts with the soft tissue which is either pale or densely and uniformly pigmented; fibre structure is heavy, concentrically laminated and pithed, but pith may be obscured by the incorporation of detritus into fibres; choanocyte chambers are large, eurypylous.

**SOUTH CHINA SEA SPECIES.**

*Dictyodendrilla membranosa* (Pallas, 1766) (Indonesia, ZMA database) (6)
*Dictyodendrilla "praetensa"* Burton, unpublished MS name (Indonesia, ZMA database) (6, Burton MS)
*Igernella mirabilis* Lévi, 1961 (Indonesia, ZMA database) (6)

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**Family Halisarcidae Vosmaer, 1885**

*Definition.* - Thin growth form, soft texture, gelatinous surface; fibrous skeleton absent entirely; choanocyte chambers consist of specialised wide-mouthed, extended tubular and branched eurypylous forms; parenchymella larvac are simple, lacking long terminal cilia; often confused with didemnid ascidians.

**SOUTH CHINA SEA SPECIES.**

*Halisarca* sp.: Dawydoff, 1952 (Vietnam, Cambodia) (3)

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**Order Verongida**

*Definition.* - “Keratose sponges” lacking spicules, typically fleshy and soft, with pigment that oxidizes to purple colouration; skeleton with large, widely spaced spongín fibres forming dendritic or reticulate structures; fibres may be aggregated (fasciculated) into bundles; no differentiation of primary and secondary elements, and detritus is only rarely incorporated into fibres; fibres have a laminated cortical (bark) region and a distinct central pith of fine spongín fibrils, but the cortex may be reduced or disappear entirely in some species; mesohyl contains abundant collagenous fibrils.

*Remarks.* - Three families are known, all of which are thought to be oviparous.

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**Family Aplysinidae Carter, 1875**

*Definition.* - Encrusting, massive, club-shaped and fan-shaped growth forms; reticulate, anastomosing spongín fibres produce polygonal meshes, not organised into one plane; fibres have normal bark and pith elements, without foreign detritus, and the collagenous spongín matrix is dense; choanocyte chambers small, spherical and diplodal.

**SOUTH CHINA SEA SPECIES.**

*Aplysina mollis* Row, 1911 (Indonesia, ZMA database) (6)
*Aplysina mollis aruensis* Hentschel, 1912 (Ara Is, Indonesia) (6)
*Aplysina* sp.; George & George, 1987 (Bodgaya Islands and Pulau Sipadan, Sabah) (4)
Family Druinellidae Lendenfeld, 1889

Definition. - Lobate and club-shaped sponges; pigmentation frequently sulphur yellow that usually oxidizes to purple, although some species have superficial pink to purple coloration and a beige to pale yellow interior; skeleton with dendritic fibres, widely spaced or greatly reduced in relation to the heavy collagenous spongion matrix, sometimes supplemented by spongion spicules; fibres with strong bark elements, and fibres have the pith component emphasised over the bark, which is typically reduced or absent; choanocyte chambers small, spherical and diploidal.

SOUTH CHINA SEA SPECIES:
Aplysina sp.: George & George, 1987 (Bodgaya Islands and Pulau Sipadan, Sabah) (4)
Aplysina sp.: Jung et al., 1995 (South China Sea) (5)
Aplysina sp. (Indonesia, ZMA database) (6)

Family Ianthellidae Hyatt, 1875

Definition. - Lobate and fan-shaped, stalked growth forms common; pigmentation ranges from typically sulphur yellow, deep orange to deep purple with oxidation to deep purple; fibre skeleton, where present, is reticulate and frequently compressed into 2 dimensions, radiating from the contracted basal attachment; fibres typically large, particularly towards the base of the sponge, containing cellular elements in distinctive concentric annuli occurring mainly in the bark component of each fibre; choanocyte chambers large and eurypylous, sac-shaped, varying between genera from simply elongate to occasionally branched.

SOUTH CHINA SEA SPECIES:
Ianthella barata (Pallas, 1766); Wilson, 1925:475; George & George, 1987 (Bodgaya Islands and Pulau Sipadan, Sabah; Indonesia, ZMA database: Philippines) (4,6,7)
Ianthella flabelliformis (Pallas, 1766); Wilson, 1925:474; Dawydoff, 1952 (Paracels Archipelago, Spratly Is, Macclesfield, Atoll de Tizard; Cabooy, 1981:9 (Indonesia, ZMA database, Philippines) (3,6,7)
Ianthella sp. 1706 (Kalimantan, Indonesia) (6, QM/NTM collection)

Class Calcarea

Definition. - With exclusively calcitic spicules ranging from discrete monactinal, diactinal, triactinal or tetractinal spicules, to reticulate skeletons composed of fused crystalline calcite spicules; megascleres and microscleres are not differentiated; skeleton and aqiferous system occurs in three grades of construction: (1) asconoid, with simple tubular construction
Hooper et al.: Sponges of the South China Sea

(olynthus), without folding of the body wall, with thin walls pierced externally by ostia, leading to tubular water canals (porocyte canals) opening onto a central choanocyte-line cavity (choanoderm), connected to the exterior, at the apex of the sponge, by a single osculum; (2) syconoid construction produced by folding of both the exterior (pinacoderm) and interior (choanoderm) walls, producing choanocyte chambers to lie within the body wall rather than only lining the central atrium as in more simple asconoid structures, but these chambers open directly onto the atrium; (3) leuconoid, found in most sponges (including the Demospongiae), with complex folding and in which the choanocyte chambers are oval and isolated in a maze of canals within the body wall, with chambers opening onto branching and complex eurrent canals; sexual reproduction in Calcarea is exclusively viviparous.

Remarks. - The Calcarea contains two subclasses, 5 orders, 18 families, 98 nominal genera (63 of which are apparently valid), and an estimated fauna of between 400-500 species worldwide. All species are marine.

Subclass Calcinea

Definition. - Regular triradiate spicules, equiangular and equiradiate or exceptionally parasagittal or sagittal, and a basal system of quadriradiates; most species have at least some spicules with the rays and angles between the rays being equal, with or without monactinal or diactinal free spicules; young sponges may have only triradiate spicules; choanocytes basinucleate, nuclei spherical, and basal body of flagellum not adjacent to the nucleus; larvae are entirely ciliated hollow blastula (coeloblastulae).

Order Clathrinida

Definition. - Skeleton composed exclusively of free spicules, without hypercalcified non-spicular reinforcements or spicule tracts.

Remarks. - Six families are currently recognised.

Family Clathrinidae Minchin, 1900

Definition. - Essentially tubular organisation, with continuous choanoderm lining all internal cavities; growth is by longitudinal median divisions and anastomosis of tubes to form large units called the cormus; neither a common cortex nor a well-defined inhalant and exhalant aquiferous system.

SOUTH CHINA SEA SPECIES.

Clathrina coriacea (Montagu, 1818); Pattanayak, 1997 (Nicobar and Andaman Islands) (1)

Clathrina sp.; George & George, 1987 (Bodgaya Islands and Pulau Sipadan, Sabah) (4)
Order Murrayonida

Definition. - Reinforcement of the skeleton composed of either spicule tracts, calcareous plates or a rigid aspicular skeleton; canal system leuconoid; diapasons (tuning-fork shaped triradiates) or modified biradiates present and generally fasciculated.

Remarks. - There are 3 families and only 3 known species.

Family Murrayonidae Kirkpatrick, 1910

Definition. - Choanosomal skeleton composed of a rigid calcareous aspicular network; cortex composed chiefly of overlapping calcareous scales, with tuning-fork spicules below.

[no recorded species]

Family Paramurrayonidae Vacelet, 1967

Definition. - Choanosomal skeleton composed of bundles of diapsons (tuning-fork triradiates) without any rigid structure; cortical skeleton composed chiefly of a superficial layer of overlapping calcareous scales and an internal layer of free calcareous plates.

[no recorded species]

Family Lelapiellidae Borjevic, Boury-Esnault & Vacelet, 1990

Definition. - Choanosomal skeleton composed of bundles of biradiates without any rigid structure; cortical skeleton composed chiefly of a tangential layer of tripods (triradiates) and curved oxeotes (biradiates).

[no recorded species]

Subclass Calcaronea

Definition. - Calcarea with incubated amphiblastula larvae flagellated only on the anterior half; nuclei of choanocytes apical, and the flagellum arises directly from the nucleus; spicules are triradiate and sagittal (two rays are paired and the third ray is longer than the others), as well as free monaxonic (monactinal or diactinal) forms; aquiferous system ranges from asconoid to leuconoid grades of construction.
Order Leucosoleniida

Definition. - Only with free spicules, without calcified non-spicular reinforcements.

Remarks. - With seven families.

Family Leucosoleniidae Minchin, 1898

Definition. - Asconoid, erect growth forms, with long, individual, clustered, oscular tubes arising from stolon-like system of basal tubes; tubes may have diverticuli and often arborescent; monaxon spicules always present; triradiates, if present, typically bilateral, sagittal, inequilateral in form (where two of the rays form a pair, while the third differs in some way), and with the crystalline optic axis never vertical but always inclined to the facial plane of the rays; choanocytes with flagellum arising directly from the pear-shaped nucleus, situated at or near the apex of the cell; choanocytes line central cavity (spongocoel) of the individual tubes; larvae are amphiblastulae.

SOUTH CHINA SEA SPECIES.
Leucosolenia blanda Poljáeff, 1884; Dawydoff, 1952 (Vietnam, Cambodia) (3)
Leucosolenia coriacea (Montagu, 1818); Burton, 1930 (Saleyer, Saley Bay, Indonesia) (6)
Leucosolenia nuclea (Lendenfeld, 1885); Burton, 1930 (Karkaralong Is, Indonesia) (6)
Leucosolenia (Leucilla) sp.nov.; Dawydoff, 1952 (Vietnam, Cambodia) (3)

Family Amphoriscidae Dendy, 1892

Definition. - Massive, tubular, ovoid and spherical growth forms, grouped together, never solitary (one genus (Syculusina) has a root-like tuft of oxeas and anchoring quadriradiates); ectosomal cortex is distinct and supported by tangentially placed radiates, with or without oxeas; ectosomal radiates may have the large arm directed inwards, forming the main part of the choanosomal skeleton; no articulated choanosomal skeleton present, but leuconoid forms may have quadriradiates scattered in the choanosome and large quadri- or triradiates below the atrium (subgastral spicules); nuclei of choanocytes probably always apical; choanocyte chambers asconoid, elongate and radially arranged, or small, spherical and irregularly scattered in the choanosome (leuconoid).

SOUTH CHINA SEA SPECIES.
Leucilla australiensis (Carter. 1886); Burton, 1930 (Banda, Indonesia) (6)

Family Grantiidae Dendy, 1892

Definition. - Encrusting, lobate, tubular, sac-shaped, ovoid, spherical, vase-shaped and many other growth forms, either solitary or grouped and sessile, substipitate, or stipitate; surface with a distinct dermal cortex and a proper cortical skeleton of tangential radiates, sometimes supplemented by, and occasionally replaced by, oxeas; ectosomal cortex sometimes with quadriradiates in association with choanosomal triradiates; skeleton of the chamber layer ranging from regularly articulate to irregularly scattered, and typically with subgastral sagittal radiates; some subdermal pseudosagittal triradiates may occur but these are derived from normal choanosomal spicules, and do not form a continuous distict layer as in the
Heteropiidae: subgastral quadriradiates, if present, always associated with chamber-layer skeleton containing confused triradiates; nuclei of collared cells probably always apical; choanocyte chambers asconoid, elongate and radially arranged, or small, spherical and irregularly scattered in the choanosome (leuconoid).

**SOUTH CHINA SEA SPECIES.**

*Anamixilla irregularis* Burton, 1930 (Bima, Indonesia) (6)
*Anamixilla torrei* (Poléjacff, 1884); Burton, 1930 (Banda, Ambon, Samau, Indonesia) (6)
*Apocrinum alcicornis* Gray, 1858 (Hong Kong) (5)
*Grantia compressa* Flemming; Dawydoff, 1952 (Vietnam, Cambodia) (3)
*Leucandra pumilla* Schmidt; Dawydoff, 1952 (Vietnam, Cambodia) (3)
*Leucandra loricata* Poléjacff, 1884; Dawydoff, 1952 (Vietnam, Cambodia) (3)
*Leuconia capillata* (Poléjacff, 1884); Burton, 1930 (Banda, Indonesia); Dawydoff, 1952 (Indonesia, Philippines, Vietnam) (3,6,7)
*Leuconia solida* (Schmidt, 1862); Van Soest, 1980 (Hong Kong) (5)
*Utcopeia argentea* Poléjacff, 1884; Burton, 1930 (Samau, Indonesia); Dawydoff, 1952 (Atoll de Tizard, Itu Aba) (3,6)

**Family Heteropiidae Dendy, 1893**

**Definition.** - Massive, tubular, pear-shaped and branching growth forms, occurring as solitary sponges or in groups; continuous cortex, pierced by ostia and reinforced by asymmetrical triradiate spicules with unequal angles, covers the entirely choanocyte chamber layer; inarticulated or articulated tubular skeleton characterised by a distinct subcortical zone formed by pseudosagittal triactines, but articulated choanosomal spicule skeleton may be present or absent; cortical triradiate spicules probably originate from articulate chamber skeleton, through reorientation of the spicules, so that one of the paired rays becomes the sagittal ray and the latter pairs up with the remaining ray; choanocyte chambers asconoid, elongate and radially arranged, or spherical and irregularly scattered in the choanosome (leuconoid).

**SOUTH CHINA SEA SPECIES.**

*Granitessa sibogae* Burton, 1930 (Indonesia) (6)
*Heteropita striata* Hozowa; Dawydoff, 1952 (Vietnam, Cambodia) (3)
*Heteropita striata* Hozowa minor Burton, 1930 (Indonesia) (6)

**Family Lepidoleuconidae Vacelet, 1967**

**Definition.** - Minute rounded sponges; ectosomal skeleton (exopinacoderm) consists of several layers of overlapping (not fused) triangular or rounded scales, derived from triradiate spicules; surface has a single osculum surrounded by several layers of quadriradiate spicules and diactines, and ostia surrounded by triradiates and microdiactinal spicules; choanosome lacks megascleles but has microquadriradiates scattered; basipinacoderm region (at the base of the sponge) has scales and triactines; tuning fork spicules or sagittal triactines never present; choanocytes with apical nuclei; larvae are amphiblastulae.

[no recorded species]
Family Sycettidae Dendy, 1892

Definition. - Tubular, spherical, flask-shaped, ovoid and branching growth forms, either solitary or in groups; ectosomal cortex is continuous and strengthened by tangential spicules, but these do not cover the choanocyte chamber layer; choanosomal spicules, supporting choanocyte chambers, have an articulated arrangement of overlapping sagittal triradiates, with the angle between the paired rays larger than the angles between each paired ray and the long, unpaired ray; sagittal triradiates have the longest ray pointing to the exterior of the sponge, and form a layer beneath the spongocoel (referred to as the subgastral position); choanocytes usually confined to the radial chambers in the adult, and probably always with apical nuclei; choanocyte chambers ascoid, arranged radially around a central cavity (spongocoel), with ends of chambers projecting into ectosomal surface.

SOUTH CHINA SEA SPECIES.
Leuconia barbata (Duchassaing & Michelotti, 1864): Burton & Rao, 1932; Pattanayak, 1997 (Nicobar and Andaman Islands) (1)
Sycon raphanus Schmidt: Dawydoff, 1952 (Gulf of Tonkin, Vietnam) (3)

Family Staurorrhaphidae Jenkin, 1908

Definition. - Solitary, tubular sac-shaped growth forms with well-developed spicule fringe around terminal oscule; continuous cortex covers the choanosome, perforated by ostia; ectosomal tetractines never present, and tangential atrial skeleton present only in oscular region; subatrial quadriradiates ("chiactines") present and equiangular; symmetrical and asymmetrical triradiates and oxeas scattered freely within choanosomal skeleton, projecting through cortex; aquiferous system is syconoid or leuconoid.

[no recorded species]

Order Lithonida

Definition. - Generally restricted to shaded habitats such as caves and tunnels; massive reinforced calcitic (hypercalcified) skeleton, together with tuning fork spicules and sagittal tetractines as free spicules; larvae are amphiblastulae; choanocytes are apinucleate.

Family Lelapiidae Dendy & Row, 1913

Definition. - Tubular, sessile growth forms; surface even, non-hispid; apical oscule with fringed margin; ectosomal skeleton of tangential sagittal triradiates and microxeas set at right angles to surface; skeleton of the chamber layer composed of large scattered oxeotes, loose bundles of tuning-fork spicules and more rarely bundles of slender oxeas, and subgastral sagittal triradiates; choanosomal skeleton composed of tangential sagittal triradiates and more rarely sagittal quadriradiates.

[no recorded species]
Family Minchinellidae Dendy & Row, 1913

**Definition.** - Encrusting and lamellate growth forms; oscules may be supported by di-, tri- and tetractinal spicules; choanosome with a rigid skeleton of fused quadriradiate spicules cemented together, or formed by intertwined rays of the triradiate and quadriradiate spicules at the base of the sponge; free spicules may include tri- and quadriradiates, monactinal or diactinal and tuning fork spicules, some or all of in the ecosomal skeleton; subgastral sagittal radiates apparently absent; nuclei of choanocytes are apical; larvae are amphiblastulae; canal system in all known forms is leuconoid.

[no recorded species]

Family Petrobionidae Borojevic, 1979

**Definition.** - Hemspherical or conical growth forms; ecosomal skeleton contains sagittal triradiates, tuning fork spicules and quadriradiates, some of which also extend into the mesohyl; basal skeleton composed of spherulitic units of calcite, fused together to form hemispherical mass, each unit with terminal osculum surrounded by collars of quadriradiates; living tissue penetrates into the calcitic mass only for short distances, and free spicules in the mesohyl include microdiactines; triradiates, with a rudimentary fourth ray, also occur at the base of living tissue; nuclei of choanocytes are apical; larvae are amphiblastulae.

[no recorded species]

Subphylum Symplasma

Class Hexactinellida

**Definition.** - Skeleton composed of six-rayed siliceous spicules (hexacts), occurring individually or fused together, usually forming rigid lattice-like skeletons; body wall has a cavernous structure, with living tissue stretching across a framework around the cavities like a membrane; this tissue is syncytial, on both the dermal region (pinacoderm) and in the choanosome, in which the multinucleolate protoplasm is not divided into cells; uniflagellated choanocytes are absent from this class of sponges, and the choanocytes are really only collar-flagellum units lining cylindrical chambers (hence they are referred to as “flagellated chambers” rather than “choanocyte chambers” as in the classes Calcarea and Demospongiae); these unusual choanocytes are embedded in the membranous protoplasm stretched between spicules by “plugged bridges”; spicules occur in three different regions, and the localization of particular spicule types to particular areas is very precise; three zones differentiated: (1) lying on or just below the dermal membrane (dermal); (2) lying within the trabeculae (parenchymal); (3) lying below the membrane around the atrial cavity (gastral); diverse geometry of megascleres and microscleres; unlike other classes of sponges axial canals of spicules are always square in cross-section; larvae are incubated parenchymellae.

**Remarks.** - The Hexactinellida is divided into 2 subclasses, 4 orders, 19 families, 113 nominal genera [of which 101 are currently recognised but many may be synonyms], and an estimated 450-500 living species are found worldwide.
Subclass Amphidiscophora

Definition. - With birotulate microscleres but lacking hexaster microscleres: sponges embedded in soft sediments by single or tufts of basal monactine spicules, not attached directly to substratum; flagellated chambers are continuous at their openings, not sharply marked off from each other as in other classes of sponges.

Remarks. - One Recent order (Amphidiscosida), containing three families.

Order Amphidiscosida

As for subclass.

Family Hyalonematidae Gray, 1857

Definition. - Spheroid or ovoid bodies, although actual shape can be very variable; tufts of long basal spicules anchor sponges into soft sediments, each bearing a terminal “anchor” (consisting of an inverted-conical swelling bearing a circle of several short teeth); basal spicules compactly bundled and twisted dextrally, forming a single basal tuft extending into sponge body and forming a compact axial columella; apical end of basal spicules produce a small projection called the gastric cone; exhalant canals open on top of the body around the columella or gastric cone and are sharply set off from the inhalant surface by the oscular margin; four separate exhalant canals may open around the columella, or the entire exhalant region may be either inwardly depressed or outwardly bulging to form a “gastral” cavity, sometimes covered by a lattice-like sieve plate; neither uncinate spicules nor scepters are present; marginal prostals are pinular rhabdidiactines (i.e. diactinal with the distal end spined); pleural prostals are smooth diactines; choanosomal supporting spicules are mostly rhabdidiactines, often occurring in association with macrohexactines or macropentactines.

SOUTH CHINA SEA SPECIES.
Chalironema sibogae Iijima, 1926 (Indonesia) (6)
Hyalonema aculeatum (Schulze, 1894); Schulze, 1902; Pattanayak, 1997 (Nicobar and Andaman Islands) (1)
Hyalonema affine (Marshall, 1875); Schulze, 1902; Pattanayak, 1997 (Nicobar and Andaman Islands) (1)
Hyalonema(Cyliconema) apertum maehrenthali Schulze, 1895; Iijima, 1926 (Indonesia) (6)
Hyalonema (Leptonema) flagellierrum Iijima, 1926 (Indonesia) (6)
Hyalonema (Eaulyalonema) intermedium Iijima, 1926 (Indonesia) (6)
Hyalonema indicum (Schulze, 1894); Schulze, 1902; Pattanayak, 1997 (Nicobar and Andaman Islands) (1)
Hyalonema (Eaulyalonema) keianum Iijima, 1926 (Indonesia) (6)
Hyalonema (Cyliconema) keicense Iijima, 1926 (Indonesia) (6)
Hyalonema (Coscinonema) kirkpatricki Iijima, 1926 (Indonesia) (6)
Hyalonema lanella (Schulze, 1900); Pattanayak, 1997 (Nicobar and Andaman Islands) (1)
Hyalonema marathanense (Schulze, 1900); Pattanayak, 1997 (Nicobar and Andaman Islands) (1)
Hyalonema masoni (Schulze, 1894); Schulze, 1902; Pattanayak, 1997 (Nicobar and Andaman Islands) (1)
Hyalonema nicobaricum (Schulze, 1904); Pattanayak, 1997 (Nicobar and Andaman Islands) (1)
Hyalonema pinnatae Schulze, 1894; Deny & Burton, 1927:230 (between N and S Sentinel Is, Andaman Is, 11° 30’N, 480m) (1)
Hyalonema rapa (Schulze, 1900); Pattanayak, 1997 (Nicobar and Andaman Islands) (1)
Hyalonema (Cyrticonema) rotundum Iijima, 1926 (Indonesia) (6)
Hyalonema (*Thaumonema*) *thamnophorum* Ijima, 1926 (Indonesia) (6)

*Hyalonema* (*Cylconema*) *imorense* Ijima, 1926 (Indonesia) (6)

*Hyalonema* (*Pteronema*) *topsenti* Ijima, 1926 (Indonesia) (6)

*Hyalonema* (*Paradiscorina*) *vosmaeri* Ijima, 1926 (Indonesia) (6)

*Hyalonema* sp.; Cabero, 1979:20 (Marinduque, San Juan, Batangas, Philippines) (7)

*Hyalonema* spp.; Ijima, 1926 (Indonesia) (6)

*Hyalonema* sp.; Dawydoff, 1952 (Vietnam, Cambodia) (3)

*Lophophysema* *inflatum* (Schulze, 1900); Schulze, 1902; Pattanayak, 1997 (Nicobar and Andaman Islands) (1)

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**Family Monorhaphididae Ijima, 1927**

**Definition.** - Body cylindrical or rounded, with sieve-like membranes along one side of the body covering openings to the aquiferous system; whole body is perched on the end of a huge single basal anchoring spicule, undoubtedly the largest siliceous structure produced by any animal; most choanosomal megascleres are stauroactines, with a single short ray perpendicular to the long axis of the spicule, although sometimes this short ray is absent producing a pseudodiactinal spicule; prostals are absent (except for the elongated basal spicule), and uncinites are moderately common.

**SOUTH CHINA SEA SPECIES.**

*Monorhaphis* *chuni* Schulze, 1904; Ijima, 1926 (Indonesia) (6)

*Monorhaphis* sp.; Burton & Rao 1932:302 (Port Blair, Andaman Is. 11° 35'N) (1)

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**Family Pheronematidae Gray, 1870**

**Definition.** - Thick-walled vase-shaped, or columnar and lamellate growth forms; oscules single, terminal, or grouped and dispersed on opposite sides of lamellae, or grouped into sieve-plates and scattered indiscriminantly; dermal spicules are scepters derived from marginal prostals (i.e. spicules projecting around the oscules) and pleural prostals (i.e. spicules projecting from the sides of the body); choanosomal spicules are uncinites and scepters, and hexactine and/or pentactines support the choanosome; basal spicules have bidentate terminal anchors, and tufts of basal spicules are never twisted nor do they form axial columns.

**SOUTH CHINA SEA SPECIES.**

*Pheronema* *echinatum* Ijima, 1926 (Indonesia) (6)

*Pheronema* *giganteum* Schulze, 1886; Ijima, 1926 (Indonesia) (6)

*Pheronema* *weberi* Ijima, 1926 (Indonesia) (6)

*Pheronema* *raphanus* (Schulze, 1894); Schulze, 1902; Pattanayak, 1997 (Nicobar and Andaman Islands) (1)

*Pheronema* sp.; Dendy & Burton, 1927:229 (between N and S Sentinel Is, Andaman Is, 11° 30'N, 480m) (1)

*Semperella* *cucumis* (Schulze, 1864); Schulze, 1902; Pattanayak, 1997 (Nicobar and Andaman Islands) (1)

*Semperella* *similis* Ijima, 1926 (Indonesia) (6)

*Sericolophus* *reflexus* Ijima, 1894; Ijima, 1926 (Indonesia) (6)
Subclass Hexasterophora

Definition. - Hexasters microscleres present, birotultrte microscleres absent; growth forms are diverse, usually fixed to substratum by a basal attachment; basal spicules, when present, consist of pentactines or anisodiactines usually in tufts.

Remarks. - Three extant orders and twelve families are recognized.

Order Hexactinosida

Definition. - Rigid parenchymal skeleton produced by fusion of hexactines; dermal and gastral spicules usually pentactines, with the unpaired ray directed inwards, or sometimes stauractines, and these spicules are usually connected by tissue only.

Family Aulocalycidae Ijima, 1927

Definition. - Vase-shaped or branching tubular growth forms; oscules on outpockets on the side walls; lateral wall dicitonal framework perforated by a system of tubular cavities (diharises), running radially through the skeleton; each cavity occupied by a single lobate flagellated chamber; cavities arranged in alternating or regularly hexagonal groups; dicitonal framework between cavities forms irregular meshes; chonosomal hexactines regular or compressed laterally so that all six rays lie in one plane; dermal spicules are hexactines or pentactines, with teeth on the distal ray; gastral spicules similar to dermals, or they are rhabdodiactines (curved diatriclals); hexaster microscleres include oxy-, tylo-, onycho- or discohexasters; scopules and uncinates always present.

SOUTH CHINA SEA SPECIES.

Aphrocallistes beatrix (Gray 1858); Schulze, 1902; Ijima, 1926; Dendy & Burton, 1927:226; Burton & Rao, 1932:302; Pattanayak, 1997 (off Port Blair, Andaman Is., 11° 40’N, 220m; 13 mls SW of North Sentinel I., Andaman Is., 11° 30’N; off N Sentinel I., Andaman Is., 11° 40’N, 500m; Nicobar and Andaman Islands; Indonesia) (1,6)

Aphrocallistes bocegi (Wright, 1870); Schulze, 1902; Pattanayak, 1997 (Nicobar and Andaman Islands) (1)

Aphrocallistes ramosus (Schulze, 1886); Schulze, 1902; Pattanayak, 1997 (Nicobar and Andaman Islands) (1)

Family Aulocalycidae Ijima, 1927

Definition. - Vasiform, spherical or tubular growth forms; main osculum above a number of lateral oscules on the sides; skeletal framework with irregular meshes, lacking canals in the dicitonal framework; hexactines inserted individually into dicitonal framework, with spicule rays frequently elongated and curved, intersecting one another at various angles, and fused together at points of their intersection (the rays often connected by synapticulae), or where they are laterally apposed or terminate by abutting on others; dermal and gastral spicules always pentactines; discohexasters always present, with or without oxyhexasters; scopules rarely present; uncinates present or absent.
Family Craticulariidae Rauff, 1893

**Definition.** - Cup-shaped growth forms; lateral wall skeleton has a dictyonal framework traversed by two sets of tubular cavities entering radially from opposite sides, running parallel but in opposite directions, forming an alternating longitudinal series originating either from the dermal or gastral sides of the framework (epiphyses or aporhyses, respectively); dermal and gastral spicules pentactines with toothed distal rays; scopules, oxyhexasters and discohexasters present; uncinates absent.

[no recorded species]

Family Euretidae Zittel, 1877

**Definition.** - Funnel-shaped, tubular and vase-shaped growth forms, the latter with tubular branches opening to the exterior through accessory oscules on the sides of vases and opening internally into a wide common gastral cavity; lateral wall of skeleton three dimensional dictyonal framework similar to Farreidae, although meshes always small, triangular, quadrangular or irregular, and certain nodes give off more than six internodal beams; body wall usually not canalized, and generally unaccompanied by aporhysis; dermal spicules pentactine or hexactines, with teeth on distal ray, or sometimes secondarily absent; gastral spicules either pentactines or hexactines, similar in form to dermal spicules; microscleres include diverse hexasters, scopules and uncinates; clavules absent, sarules rarely present.

SOUTH CHINA SEA SPECIES.

*Rhabdodictyum karensae* Ijima, 1926 (Indonesia) (6)
*Tretopleura candelabrum* Ijima, 1926 (Indonesia) (6)

**Family Euretidae Zittel, 1877**

**Definition.** - Funnel-shaped, tubular and vase-shaped growth forms, the latter with tubular branches opening to the exterior through accessory oscules on the sides of vases and opening internally into a wide common gastral cavity; lateral wall of skeleton three dimensional dictyonal framework similar to Farreidae, although meshes always small, triangular, quadrangular or irregular, and certain nodes give off more than six internodal beams; body wall usually not canalized, and generally unaccompanied by aporhysis; dermal spicules pentactine or hexactines, with teeth on distal ray, or sometimes secondarily absent; gastral spicules either pentactines or hexactines, similar in form to dermal spicules; microscleres include diverse hexasters, scopules and uncinates; clavules absent, sarules rarely present.

SOUTH CHINA SEA SPECIES.

*Eurete freelandi* Ijima, 1926 (Indonesia) (6)
*Eurete marshalli* Schulze, 1886; Ijima, 1926 (Indonesia) (6)
*Eurete schmidtii treubi* Ijima, 1926 (Indonesia) (6)
*Eurete schmidtii kampeni* Ijima, 1926 (Indonesia) (6)
*Eurete trachylocus* Ijima, 1926 (Indonesia) (6)
*Leptostyela ceramensis* Ijima, 1926 (Indonesia) (6)
*Mylia calloxythus* Gray, 1859; Ijima, 1926 (Indonesia) (6)
*Mylia verrucosa* Ijima, 1926 (Indonesia) (6)
*Pararete baliense* Ijima, 1926 (Indonesia) (6)
*Pararete farreopsis farreopsis* (Carter, 1877); Ijima, 1926 (Indonesia) (6)
*Pararete farreopsis fragiferum* Ijima, 1926 (Indonesia) (6)
*Pararete farreopsis subglobosum* Ijima, 1926 (Indonesia) (6)
*Pararete farreopsis jakosalemi* Ijima, 1926 (Indonesia) (6)
*Pararete freeri* Ijima, 1926 (Indonesia) (6)
*Pararete kangeanganum* Ijima, 1926 (Indonesia) (6)
*Pararete semperi* (Schulze, 1886); Ijima, 1926 (Indonesia) (6)
*Periphragella parva* Ijima, 1926 (Indonesia) (6)
*Periphragella irregularis* Ijima, 1926 (Indonesia) (6)
*Pleurochorium cornutum* Ijima, 1926 (Indonesia) (6)
Family Farreidae Gray, 1872

**Definition.** - Funnel-shaped and tubular, simple or branched growth forms; branching tubes all approximately equal in width; each branch ending with an oscule; lateral wall of skeleton consisting of a secondary quadratic skeletal mesh consisting of nodes which are all a hexactin centre; six internodal beams radiate from these nodes, usually laterally apposed and amalgamated combinations of two rays, each from adjacent hexactins; this typically regularly-meshed structure may become irregular due to accretion of dictyonal hexactins, in indefinite orientation, formed after the primary framework is established; dermal and gastrolic spicules pentactines; uncinitates usually present; microscleres include oxyhexasters, tylohexaster and discohexasters; sceptules present usually in the form of sarule, lonchiole or clavule, sometimes including monactinal triaxons, but lacking scopules; flagellated chambers laterally branched.

SOUTH CHINA SEA SPECIES.

*Farrea hatitschi* Ijima, 1926 (Indonesia) (6)
*Farrea lendenfeldli* Ijima, 1926 (Indonesia) (6)
*Farrea nodulosa* Ijima, 1926 (Indonesia) (6)
*Farrea occa* Carter, Dendy & Burton, 1927:226; Schulze, 1902 (8 mls W of Interview I., Andaman Is. 13°N, 90-540m; N Sentinel I., Andaman Is. 11° 30’N, 500m) (1)
*Farrea occa erecta* Ijima, 1926 (Indonesia) (6)
*Farrea occa clavigera* Schulze, 1886; Ijima, 1926 (Indonesia) (6)
*Farrea occa subclavigera* Ijima, 1926 (Indonesia) (6)
*Farrea occa mammillata* Ijima, 1926 (Indonesia) (6)
*Farrea occa cuspidata* Ijima, 1926 (Indonesia) (6)
*Farrea occa owensii* Ijima, 1926 (Indonesia) (6)
*Farrea spirifera* Ijima, 1926 (Indonesia) (6)
*Farrea spp.;* Ijima, 1926 (Indonesia) (6)

Family Tretodictyidae Schulze, 1886

**Definition.** - Thick-walled cup-shaped, funnel-shaped or plate-like growth forms, or reticulate masses of branching tubes or solid cylinders; lateral wall dicytonal framework composed of irregular tri- or quadrangular meshes with multiradiate nodes, marked by development of extensive canal system (schizorhyses) containing labyrinths of flagellated chambers; chambers interconnecting and/or dividing and branching, running from gastroside (covered by a membrane) to dermal side of dicytonal framework (the latter covered by scie-like membrane); diverse hexaster microscleres present; uncinitates and scopules also present.

SOUTH CHINA SEA SPECIES.

*Anomochoene expansa* Ijima, 1926 (Indonesia) (6)
*Anomochoene globosa* Ijima, 1926 (Indonesia) (6)
*Hexactinella luta* (Schulze, 1886); Ijima, 1926 (Indonesia) (6)
*Hexactinella lingua* Ijima, 1926 (Indonesia) (6)
*Hexactinella minor* (Dendy & Burton, 1927:227, fig. 1); Pattanayak, 1997 (8 mls W of Interview I., Andaman Is. 13°N, 90-540m; Nicobar and Andaman Islands) (1)
*Hexactinella rugosa* Ijima, 1926 (Indonesia) (6)
*Hexactinella spongiosa* Ijima, 1926 (Indonesia) (6)
*Hexactinella vermiculosa* Ijima, 1926 (Indonesia) (6)
*Pilocladix wilsoni* Ijima, 1926 (Indonesia) (6)
*Sclerothamnopsis schulzei* Ijima, 1926 (Indonesia) (6)
*Sclerothamnus clausi* Marshall, 1875; Ijima, 1926 (Indonesia) (6)
*Tretodictyum punicosum* Ijima, 1926 (Indonesia) (6)
*Tretodictyum schrammeni* Ijima, 1926 (Indonesia) (6)

193
Order Lychniscosida

Definition. - Sponges firmly attached to substratum; parenchymal megascleres lychniscs, or derivatives, united in a rigid framework; central part of each spicule surrounded by twelve struts arranged like the edge of an octahedron.

Family Aulocystidae Schulze, 1886

Definition. - Ovoid and bulbous stalked growth forms, with branching and rejoining aquiferous tubes and interconnected canals; external surface with secondarily produced layer consisting of a feltwork of fine rays from projecting stauractines and pentactines; dermal and gastral pentactines present; microscleres include oxy-, disco- and graphiohexasters.

SOUTH CHINA SEA SPECIES.
Neoauleocystis zittelii zittelii (Marshall & Meyer, 1877); Ijima, 1926 (Indonesia) (6)
Neoauleocystis zittelii sibogae Ijima, 1926 (Indonesia) (6)
Diapleurura maasi Ijima, 1926 (Indonesia) (6)

Family Dactylocalycidae Gray, 1867

Definition. - Vasiform growth forms with folded walls; lychniscs of dictyonal framework of lateral wall secondarily fused producing a “pseudohexactinosidan” skeleton; dermal pentactines and hexactines present, and free hexactines also occur as parenchymal spicules; microscleres include oxy- and discohexasters; uncinates and scopules absent.

[no recorded species]

Order Lyssacinosida

Definition. - Parenchymal megascleres vary from hexactines to rhabdodiactines, usually occurring free in tissues, sometimes secondarily fused to form rigid framework; dermal spicules consist of a single layer of large pentactines or hexactines, with single, long, proximal ray directed inwards, or with a layer of small dermal spicules overlying larger hypodermal pentactines, with the unpaired ray extending inwards.

Family Caulophacidae Schulze, 1886

Definition. - Solitary or branching, cup-shaped and mushroom-shaped growth forms, with the stalk firmly attached to substratum; dermal skeleton with small hexactines, sometimes pentactines bearing spined proximal rays; hypodermal spicules pentactines and sometimes rhabdodiactines; parenchymal spicules hexasters and rhabdodiactines; microscleres include disco-, onycho- or oxyhexasters, sometimes with strobiloplumicomes.
SOUTH CHINA SEA SPECIES.
*Cauleophacus* sp.; Ijima, 1926 (Indonesia) (6)

**Family Euplectellidae Gray, 1867**

Definition. - Tubular, massive or cup-shaped growth forms ("venus flower baskets"), often with many open oscules; bases either stalked, firmly attached to substratum, or with tufts of monactinal or anisodiactinal basal spicules; dermal skeleton has large hexactinal spicules (dermalia) with proximal ray longest; hypodermal spicules absent; parenchymal spicules hexactines with two to six rays; hexasters diverse, including floricomes, graphio-, oxy- and onychohexasters.

SOUTH CHINA SEA SPECIES.
*Bolosoma cayum* Ijima, 1926 (Indonesia) (6)
*Euplectella aspergillum* Owen; Burton & Rao, 1932;302; Cabeloy, 1979;20; Pattanayak, 1997 (N. Andaman Is., 13° 10'N; Nicobar and Andaman Islands; Cebu Is., Philippines) (1)
*Euplectella ("Eudictyon") elegans* Burton, unpublished MS name (Indonesia, ZMA database) (6; Burton MS)
*Euplectella regalis* (Schulze, 1900); Schulze, 1902; Pattanayak, 1997 (Nicobar and Andaman Islands) (1)
*Euplectella simplex* (Schulze, 1895); Schulze, 1902; Pattanayak, 1997 (Nicobar and Andaman Islands) (1)
*Euplectella timorensis* Ijima, 1926 (Indonesia) (6)
*Euplectella* sp.; Dawydoff, 1952 (Paracels Archipelago; Singapore region) (2,3)
*Euplectella* sp.; Dawydoff, 1952 (Spratly Is) (3)
*Regadrella cylindrica* Ijima, 1926 (Indonesia) (6)

**Family Leucopsacidae Ijima, 1903**

Definition. - Thick-walled cup-shaped or ovoid, stalked growth forms; body anchored to substratum by basal spicules; dermal skeleton has large dermal pentactines with unpaired ray directed inwards, without hypodermal spicules; parenchymal spicules hexactines and rhabdodiactines; microscleres hexasters including discohexasters, sigmatocomes, floricomes, but not oxyhexasters.

SOUTH CHINA SEA SPECIES.
*Chaunoplectella stellata* Ijima, 1926 (Indonesia) (6)
*Leucopsacus scoliodocus* Ijima, 1926 (Indonesia) (6)

**Family Rossellidae Gray, 1872**

Definition. - Cup-like or sac-shaped growth forms, often with a stalk, attached directly to substratum, or with basal processes, or with tufts of pentactinal basal spicules; secondary oscules may be present in addition to main terminal oscule; dermal skeleton with small roughened pentactines, stauractines or rhabdodiactine spicules, having similar rays and not markedly spined; distal rays of dermal spicules, if developed, similar to remaining rays and not markedly spined; hypodermal spicules pentactines or rhabdodiactines or both, sometimes protruding through surface so that spicule rays form veil-like covering over the sponge; parenchymal spicules hexactines and or rhabdodiactines; microscleres oxy- and discohexasters, sometimes discoctasters.
SOUTH CHINA SEA SPECIES.

Bathydorus pedunculatus Ijima, 1926 (Indonesia) (6)

Lophocalyx spinosa (Schulze, 1900); Schulze, 1902; Pattanayak, 1997 (Nicobar and Andaman Islands) (1)

Lophocalyx salmonus Ijima, 1926 (Indonesia) (6)

Lophocalyx sp.: Dawydoff, 1952 (Vietnam, Cambodia) (3)

Staurocalyx pellatissimus Ijima, 1926 (Indonesia) (6)

INCERTAE SEDIS AND OTHER INVALID NAMES

SOUTH CHINA SEA SPECIES.

Cacochalina typica Lendenfeld, 1887; Dragnewitsch, 1906:443 (Singapore, 1° 30’N) (2)

Coscinospongia thomasi (Sollas, 1888; 307); Wilson, 1925:460 (Indonesia, ZMA database; Philippines) (6,7)

“Cryptospongia enigmatica” (Burton, 1928:133, pl.2, fig.5); Pattanayak, 1997 (off Ten Degree Channel, S of Andaman Is, 20°00N, 10°N; Nicobar and Andaman Islands) (1) [this is a stalk of a gorgonian, not a sponge]

Polyfibrosa australis (Lendenfeld) conalata Lévi, 1961: 146 (Vietnam) (3)

Seliscophon echinelleides Doderlein, 1883; Burton & Rao, 1932:308 (N. of King L, Mergui Archipelago, 12° 48’N) (1) [incertae sedis within “Lithistida”]

Siphonidiella densi Burton, 1928:112, fig.3 (W of Mergui Archipelago, 13° 04’N) (1) [incertae sedis within “Lithistida”]

Tretolophus panicens Sollas, 1888 (Indonesia, ZMA database) (6) [incertae sedis within “Lithistida”]

DISCUSSION

The inventory of sponges living in the South China Sea region is already substantial, consisting of more than 1500 species described in the literature and/or known from contemporary, unpublished collections. On the basis of these recent collections, particularly those acquired under US National Cancer Institute (NCI) funding, we estimate that sponge biodiversity in this region is much higher - possibly three times greater - than presently known.

This estimate is realistic given that NCI collections, for example, were restricted to samples of about one kilogram wet weight (an optimal requirement for biochemical analysis and elucidation of active molecular compounds), which virtually excluded the diverse encrusting and cryptic faunas.

However, accurate estimates of sponge diversity for the whole region are difficult to make for several reasons. There have been only a few comprehensive studies using modern collection methods. These mainly concern small embayments and reefs (e.g. Phuket in Thailand; Dumaguette in the Philippines) (Hooper, unpublished data), and whilst these may provide accurate inventories for small local faunas, these data cannot necessarily be extrapolated to larger regions. Unfortunately, so far, there have not been any comprehensive, modern taxonomic inventories made for broader regions within the South China Sea, and we still do not know the extent of regional endemism for species, nor the taxonomic relationships between species from adjacent biogeographic provinces. There has never been a taxonomic specialist based in this region studying the sponge fauna for any significant period, who could provide these sorts of data. Most existing collections have been made opportunistically, or as a coincidental by-product from other studies.
We do know that the Indo-Malay (‘East Indies’) fauna contains the highest diversity of any marine provinces for several marine invertebrate phyla (Briggs, 1987), with more recent empirical support provided by scleractinarian coral distributions (Veron, 1995). It is likely, although not yet certain, that this is also true for sponges. Lévi (1979) suggested that the Indo-Malay archipelago may be the centre of dispersal for Indo-west Pacific species, and Hooper & Lévi (1994) suggested that sponges showed higher apparent regional endemism than many other marine phyla; they were heterogeneous in their local regional distributions (possibly related to stringent ecological requirements); and they were probably most diverse in the Indo-Malay archipelago (although there are also areas outside this archipelago in which faunas show comparable ‘megadiversity’). Each of these points has implication in estimating biodiversity, and in determining appropriate conservation and preservation strategies for these resources in the South China Sea region.

Low cosmopolitanism: Only about 5% of sponge species appear to be truly widely dispersed across the Indo-Pacific (usually associated with the distribution of coral reefs themselves), whereas most species have much higher regional endemism (apparently restricted to relatively small embayments, remote island groups and isolated patches of reef on the continental shelves).

Within the South China Sea there are a number of species that are known to have wide Indo-Pacific distributions and most of these are found in coral reef habitats (e.g. Cinachyra australiensis, “Jaspis stellifera” (which is neither a Jaspis, nor conspecific with “stellifera”; Kennedy, in prep.). Spirastrella vagabunda, Terpios fagax, Astrcosclera willvama, Clathria (Microciona) atrasanguinea, Clathria (Thalysia) vulpina, lotrochota baculifera, Tedania anhelans, Bienna tubulata, Acanthella cavernosa, Axinella carteri, Hapilclona (‘Sigmadicia’) cyanaeformis, Gelliodes fibulatus, Xestospongia testudinaria, Dysidea herbacea, Phyllospongia papyracea, Carteriospongia folioscens, Dactylospongia elegans, Hyrtios erecta). Some species have clearly been introduced through human activities, such ship bilgewater and transport of shells used in oyster farming (e.g. Mycale (Zygomycale) parishii, Tetilla dactyloidea, Cliona vastifica). However, most species are only known from relatively restricted ranges within this broad region (‘apparent endemics’), and many of these probably have relatively more specialised ecological requirements.

High ecological specialisation: Long thought to be ‘ecological generalists’, most sponges associated with coral reefs appear to have far more stringent ecological requirements and microhabitat distributions than previously acknowledged. Observations on heterogeneity amongst adjacent reef assemblages (Hooper, 1994) suggest that species composition may be more dependent upon reef geomorphology, and the availability of particular niches, than on the proximity of adjacent reef systems.

The diversity of geomorphological structures and other habitat types in shallow-waters may partially explain the observations of higher sponge diversity in shallow-waters than in the relatively more homogeneous deeper-waters, but there are undoubtedly other important factors that must be considered, as discussed below. Areas of high biodiversity value (and consequently traditionally legislated for protection and preservation by governments and other agencies), chiefly concern reef systems. Sponges are not substantially different in this regard except that, in general, they are more obvious and perhaps more diverse outside reef structures (such as at the base of reefs, in lagoonal areas, and on the submerged reefs lying on the continental shelf, surrounding the emergent coral reefs). Consequently, in designing appropriate models for species and habitat protection, which would include the sponge
biodiversity, it is important to consider these non-emergent reef structures associated with, or in proximity to, coral reef systems.

There are many specialised niches utilised by sponges, such as excavating soft and hard sediments (e.g. *Spirastrella vagabunda*), boring calcareous substrates (e.g. *Chiona lobata*), growing on, and smothering living corals (e.g. *Chondrilla australiensis*, *Iotrochota baculifera*), growing only in dimly lit or dark caves (e.g. *Astrosclera willeiana*), in seagrass beds (e.g. *Callyspongia ridleyi*), commensal with bivalves (e.g. *Monachora unguiculata*), commensal with cnidarians (e.g. *Mycale sp.* (sensu van Soest & Verseveldt, 1987)), anchored in deep soft sediments (e.g. *Poterion neptuni*), etc. The distribution of these sponges is presumably closely linked to the distribution and availability of the habitats themselves. Preservation of genetic diversity necessarily involves protection of all these types of habitats.

**High speciation:** An increasing number of apparently widely distributed sponge 'morpho-species' have since been discovered to be genetically distinct, allopatric sibling species (with restricted, localised distributions), presumably with speciation consequent to isolation (but perhaps also with the potential to rehybridise in the event of re-contact with parent populations, as in the case with scleractinarian corals (Veron, 1995)). Isolation, local extinctions, and speciation are predominant in the more transitory shallow-water environments, whereas in more stable deeper-water habitats species may be both more widely distributed and persistent (i.e. the many Mesozoic relict species described from deeper-waters by Lévi & Lévi (1983a,b, 1988)). Consequently, whilst shallow-waters may contain a greater diversity of species, deeper-water assemblages usually contain a greater proportion of endemic species (Lévi & Lévi, 1983a,b, 1988; review in Hooper & Lévi, 1994). There are also many genera and families of sponges restricted to either shallow- or deeper-waters, with apparently very little mixing between these communities (Boury-Esnault & Lopes, 1985).

To maximise the outcomes during the implementation of a conservation strategy (i.e. to protect as many biological and genetic resources as possible using finite resources), regions containing high concentrations of various species are usually targeted (e.g. shallow-water coral reef systems). Whilst these areas are certainly more visible, and perhaps more readily susceptible to current human impacts, they do not necessarily contain the most unique genetic resources (i.e. species with the greatest taxonomic and genetic divergence). Marine reserves systems should contain strategies to preserve both diversity and endemism.

**High apparent endemism:** For sponges, probably more so than other marine phyla, we still know so little about marine biogeography. It is still uncertain whether closely adjacent marine biogeographic provinces are stable, and in which faunal composition is predominantly historical in origin (e.g. through tectonic events; Briggs, 1987), or ephemeral and predominantly influenced by changing patterns of water circulation, as for the scleractinarian corals (Veron, 1995). Probably both influences are important to the modern-day sponge distributions. Neither are we certain about the longevity of sponge individuals, recruitment rates, and the extent and capability of adults to disperse, nor the mobility and longevity of sponge larvae and asexual reproductive products. We do know, however, that there are many distinct regional sponge faunas throughout the Indo-west Pacific. Some faunas are separated from each other only by relatively narrow physical barriers yet contain dramatically divergent species’ assemblages (e.g. Sahul Shelf, NW. Australia, and southern Indonesia (Hooper, 1994); east and west coasts of Palawan, Philippines (Hooper, unpublished data)), whereas
differences between faunas in other adjacent provinces may be more subtle (e.g. northern and southern regions of the Philippines).

There are several obvious, important endemic species in the South China Sea region that do not appear to have close relatives in adjacent provinces (such as the huge vase-shaped *Poterion neptuni*), whereas most ‘apparent endemics’ have at least some sister species elsewhere in the Indo-Pacific region (e.g. *Diacarne megaspinorhabdosa* from the Philippines (and Papua New Guinea) and *D. bellae* from the west central Pacific (Kelly-Borges & Vacelet, 1995); *Clathria basilana* from the Philippines and Indonesia (Levi, 1961; van Soest, 1989) and *C. oxyphila* from SE Australia (Hooper, 1996); and *Acarnus primigenius* from Indonesia and *A. ternatus* from N. Australia (van Soest et al., 1991)). It is not presently possible to provide a realistic estimate of levels of species endemism for this region, but it would certainly be in the vicinity of many hundreds to over one thousand species.

There are so far no known endemic genera or families of sponges restricted to the South China Sea, which is not surprising given its claim as the centre for dispersal within the Indo-Pacific (Levi, 1979).

**ACKNOWLEDGEMENTS**

We thank the organisers and sponsors for providing the opportunity to participate in the workshop on “Biodiversity Assessment and Inventories of Key Organisms in the South China Sea” (National University of Singapore, May 1997), particularly our productive collaboration with Peter Ng, Mike Holmes, Serena Tco and other staff of the NUS. We are also grateful to several other collaborators who provided information on their collections from the South China Sea region: Vladimir Krasonchin (Pacific Institute of Bio-organic Chemistry, Vladivostok, Russia), Nguyen Huu Phung (Marine Biology Museum, Nha Trang, Vietnam), and Li Jinhe (Institute of Oceanology, Academia Sinica, China).

**BIBLIOGRAPHY**


APPENDIX

Demospongiae and Hexactinellida of the South China Sea
in the Institute of Oceanology, Academia Sinica.

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The Hexactinellida listed here were collected over the last 40 years by the Institute of Oceanology, comprising 13 species, 2 possibly new. The Demospongiae were collected by the Chinese-German Conjoint Project on a marine biological survey of Hainan Island during 1991-92 to investigate the intertidal, subtidal and shallow water fauna, comprising more than one hundred specimens in 29 species (1 probably new).

Class Demospongiae

Order Spirophorida
Family Tetillidae
Tetilla leptodermata Sollas, 1886
Cinachyra albaobtusa Lendenfeld, 1907

Order Astrophorida
Family Ancorinidae
Rhabdastrella (‘Stelleta’) globostellata (Carter, 1883)

Order Hadromerida
Family Tethyidae
Tethya aurantium (Pallas, 1766)

Family Polymastiidae
Polymastia robusta Bowerbank, 1861

Family Spirastrellidae
Spirastrella cuneatrr Schmidt, 1868

Order Agelasida
Family Agelasidae
Agelas robusta Pulitzer-Finali, 1982

Order Poecilosclerida
Family Mycalidae
Mycale adhaerens (Lambe)
Mycale (‘Zygomycale’) parishii (Bowerbank, 1875)

Family Desmacellidae
Bienna fortis (Topsen, 1897)
Bienna “peripeduncula” MS name, possibly new

Family Myxillidae
Liotrochoaster tota de Laubenfels, 1951

Order Halichondrida
Family Halichondriidae
Halichondria panicea Johnston, 1842 [misidentification of an Indo-Pacific species for a N. Atlantic species]

Order Haplosclerida
Family Chalinidae
Adocia caminata Bergquist, 1980
Haliclona (Sigmadocia) cymiformis (Esper, 1794)
Haliclona melior (Ridley & Dendy)
Haliclona (‘Rhaphisia’) pallida (Ridley, 1895)
Haliclonula tufa (Ridley)  
Reniera cinerea (Grant)  
**Family Callyspongiidae**  
*Callyspongia diffusa* (Ridley, 1884)  
*Callyspongia ridleyi* Burton, 1934  
**Family Niphactidae**  
*Gellides incrustans* Dendy, 1905

**Order Dictyoceratida**  
**Family Dysideidae**  
*Dysidea fragilis* (Montagu, 1818)  
*Spongella gracilis* Vosmaer, 1883  
**Family Spongidae**  
*Hyattella intestinalis* (Lamarck, 1814)  
*Spongilla officinalis* Linnaeus, 1794  
*Spongilla hispida* Lendenfeld, 1888

**Order Verongida**  
**Family Druinellidae**  
*Druinella (Psammoplysilla) purpurea* (Carter, 1880)  
**Family Aplysinidae**  
*Aplysina fistularis* (Pallas)

**Class Hexactinellida**  
**Subclass Amphidiscophora**

**Order Amphidiscosida**  
**Family Hyalonematidae**  
*Hyalonema (Pteronema) topsenti* Ijima, 1926  
**Family Pheronematidae**  
*Pheronema carpenteri* (Thompson, 1877)  
*Pheronema "usilantuncatum" MS name, possibly new  
*Semperella similis* Ijima, 1926  
*Semperella "monacinalis" MS name, possibly new  
**Family Monorhaphididae**  
*Monoraphis* sp.

**Subclass Hexasterophora**

**Order Hexactinosida**  
**Family Farreaeidae**  
*Farrea occa* Carter  
**Family Euretidae**  
*Paraere farenopsis fareopsis* (Carter)  
**Family Aphrocallistidae**  
*Aphrocallistes beatix* (Gray, 1858)  
*Aphrocallistes ramosus* (Schulze, 1886)

**Order Lyssacinosida**  
**Family Euplectellidae**  
*Euplectella oweni* Herklot & Marshall, 1868  
*Euplectella marshalli* Ijima, 1895  
*Euplectella timorensis* Ijima, 1926