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A new sponge *Desmapsamma vervoorti* spec. nov. (Poecilosclerida: Desmacididae) from Indonesia

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Key words: Porifera; Indonesia; new species; *Desmapsamma*.
A new poecilosclerid sponge species *Desmapsamma vervoorti* spec. nov. is described from several Indonesian localities: Ambon, Jedan, Salayar, Komodo, Java, and Irian Jaya. The species was earlier reported from several Indo-Pacific localities as *D. anchorata* (Carter, 1882), a common Caribbean shallow water species. Comparison with Caribbean specimens makes it clear that Indo-Pacific specimens demonstrate small but consistent differences.

Introduction

Several Indo-Pacific sponge species still bear names of species originally described from the western Atlantic and Caribbean. An example is *Desmapsamma anchorata* (Carter, 1882), a common species in shallow waters of the western Atlantic (cf. Van Soest, 1984), which has been reported from North-East Australia (Burton, 1934), and East Africa (Burton, 1959; Pulitzer-Finali, 1993). It is likely that Indo-Pacific specimens reported as *Desmacidon reptans* Ridley & Dendy (1887) from Japan (Tanita & Hoshino, 1990) and the South China Sea (Lindgren, 1897) belong to the same species, since *D. reptans* - originally described from Brazil - is generally considered a junior synonym of *D. anchorata*. On close examination, other wide-spread Indo-Pacific/western Atlantic 'species' invariably turned out to consist of closely related but clearly different sister species. Two sponge examples may suffice to illustrate this:

(1) *Biemna tubulata* (Dendy, 1905) was originally recorded from the Indian Ocean and subsequently from the Caribbean (De Laubenfels, 1936; Van Soest, 1984); specimens from the latter area are now considered to represent a separate species, *Biemna caribea* Pulitzer-Finali (1986).

(2) *Lissodendoryx isodictyalis* (Carter, 1882) was originally described from the Caribbean, and subsequently from e.g. Indonesia (Carter, 1886; Topsent, 1897); the Indonesian specimens were described as two different species, viz. *L. similis* and *L. ternatensis* by Thiele (1899; 1903), which was confirmed by later authors (e.g. Hofman & van Soest, 1995).

In line with these comparisons I made a close study of Siboga Expedition and Indonesian-Dutch Snellius II Expedition samples provisionally identified as *Desmapsamma anchorata*, and compared the results with Curaçao, Bonaire and Colombian samples. This study revealed that both sets of samples show small but consistent differences and accordingly the Indonesian samples are referable to a new species, which will be described below.

Material and methods

Specimens from the following localities were studied, all incorporated in the Porifera collection of the Zoölogisch Museum Amsterdam:

ZMA POR. 836 (Siboga Expedition Sta. 162, labelled *Desmapsamma anchorata*, det. M. Burton), 838 (Siboga Expedition Sta. ?7, labelled *Desmapsamma anchorata*, det. M. Burton), 839 (Siboga Expedition Sta. 273, labelled *Desmapsamma anchorata*, det. M. Burton), 841 (836 (Ambon, coll. Willems Geerooms, labelled *Desmacidon reptans*, no identifier mentioned, presumably G.C.J.Vosmaer), 844 (Ambon, coll. Willems Geeroms, labelled *Desmacidon reptans*, no identifier mentioned, presumably G.C.J. Vosmaer), 2754 (Siboga Expedition Sta. 213, labelled *Desmapsamma anchorata*, det. M. Burton), 7887 (Snellius II Expedition Sta. 4.010, labelled *Desmapsamma* spec., det. R. van Soest), 8190 (Snellius II Expedition 4.007, labelled *Desmapsamma* spec., det. R. van Soest), 8206 (Snellius II Expedition Sta. 4.007, labelled *Desmapsamma* spec., det. R. van Soest), 8403 (Snellius II Expedition Sta. 4.079, labelled *Desmapsamma* spec., det. R. van Soest).

For comparison specimens in the ZMA collections identified as *Desmapsamma anchorata* from Curaçao, Bonaire, Venezuela, Colombia (cf. Van Soest, 1984) and the Cape Verde Islands (cf. Van Soest, 1993) were also studied.

Preparation for light microscopy and SEM followed the usual procedures (see for instance Van Soest, 1984). Spicule size data are based on 25 measurements.

Taxonomic part

Phylum Porifera
Class Demospongiae
Order Poecilosclerida
Suborder Myxillina Hajdu et al., 1994

Definition: Poecilosclerida with tridentate or polydentate, arcuate or anchorate chelae.

Family Desmacididae Schmidt, 1870

Emended definition: Myxillina with tridentate anchorate or unguiferate chelae and diactinal (normally oxeote) megascleres. No morphological differentiation in ectosomal and choanosomal megascleres.

Remarks: The contents of the family Desmacididae are here narrowed down to include only the type genus *Desmacidon* and the closely related genus *Desmapsamma*. This is inspired by recent refinements made by Hajdu et al., 1994, in the classification of the Poecilosclerida, based on the shape of the chelae and the differentiation and shape of the megascleres. A former, very wide concept of Desmacididae (often cited as "Desmacidonidae") has been shown to be inconsistent and untenable (Hajdu et al., 1994). Desmacididae are the sister family of the Myxillidae s.s., from which they differ in the lack of styles. It is presumed that these have become replaced by the ectosomal tornotes which are predominantly oxeas in Desmacididae.

Genus *Desmapsamma* Burton, 1934

Type species: *Fibularia anchorata* Carter, 1882

Definition: Desmacididae with paucispicular isotropic reticulation; sand is normally incorporated in variable quantities, especially found at the surface.

Remarks: The main differences with the only other genus currently assigned to the family, i.e. *Desmacidon*, are the more anisotropic system of thick spicule tracts and the absence of sand of that genus.

Desmapsamma vervoorti spec. nov.
(figs 1, 2A-E, 3A-E)

Desmacidon reptans Lindgren, 1897: 21; ?Tanita & Hoshino, 1990: 127, pl. 13 fig.3, text-fig. 78 (not: Ridley & Dendy, 1886: 345).

Desmapsamma anchorata Burton, 1934: 547; Burton, 1959: 239; Pulitzer-Finali, 1993: 295; Hooper & Wiedenmayer, 1994: 165 (not: *Fibularia anchorata* Carter, 1882: 283).

?*Desmapsamma* sp. 800 Hooper, 1994: 104, table I.

Material.— Holotype: ZMA POR. 8190, Dutch-Indonesian Snellius II Expedition, Sta. 4.007, 03°38'S 128°12'E, Ambon Bay, Guru-Guru, near Eri, 7/III/26, 3.ix.1984, muddy coral reef, 4-10 m, coll. R.W.M. van Soest.

Paratypes: ZMA POR. 8206, Dutch-Indonesian Snellius II Expedition, Sta. 4.007, 03°38'S 128°12'E, Ambon Bay, Guru-Guru, near Eri, 7/III/43, 3.ix.1984, muddy coral reef, 4-10 m, coll. R.W.M. van Soest; ZMA POR. 7887, Dutch-Indonesian Snellius II Expedition, Sta. 4.010, Ambon Bay, inner bay, E of Tawiri, 10/II/12, 6.ix.1984, muddy shore, 1-4 m, coll. J.C. den Hartog; ZMA POR. 8403, Dutch-Indonesian Snellius II Expedition, Sta. 4.079, 08°35"S 119°34.2'E, Komodo Island, Selat Linta, 79/III/29, 18.ix.1984, 4-11 m, coral reef, coll. R.W.M. van Soest; ZMA POR. 836, Siboga Expedition, Sta. 162, ca. 01°S 130°E, between Loslos and Broken Islands, W coast of Salawatti, Vogelkop Peninsula, SE 1868, 18.viii.1899; ZMA POR. 838, Siboga Expedition, Sta. ?7, 07°55'S 114°26'E, Batjulmati, East Java, SE 1562IV, 11.iii.1899, 15 m, coral; ZMA POR. 839, Siboga Expedition, Sta. 273, ca. 05°S 135°E, Jedan Island, Aru Islands, SE 145iA, 23.xii.1899, 13 m; ZMA POR. 841, Ambon, coll. Willems Geerooms, no further data; ZMA POR. 844, Ambon, coll. Willems Geerooms, no further data; ZMA POR. 2754, Siboga Expedition, Sta. 213, ca. 06°S 120°E, Salayer SE 256, 26.x.1899, 36 m.

Colour.— Surface encrusted by a thinner or thicker coat of sand grains which may cause the colour to range from reddish brown to greyish blue. Underneath this sand coat the colour is red or orange.

Shape, size, surface and consistency (fig. 1).— Massively encrusting, often with elongate lobes or branches which may creep along the substrate. There may be also thin fistule-like outcrops issuing from the upper surface. Size of holotype 6 × 2.5 × 2 cm, of paratypes 2-10 × 1-3 × 0.5-2 cm, length of creeping branches up to 12 cm or more. Surface irregular, a bit rough in appearance, sand-encrusted. Oscules free from sand crust, small, often with a star-like system of canals leading to them. This is not apparent in preserved samples. Consistency compressible, soft or slightly firm, easily damaged.

Spicules.— Megascleres oxeas (figs 2C, 3A) with cylindrical shape (shaft isodiametric over most of its length), slightly curved, with sharp, occasionally mucronate, apices; size: 186-*197.2*-213 × 7-*8.4*-10 μm (holotype), 150-215 × 7-11 μm (holotype and paratypes).

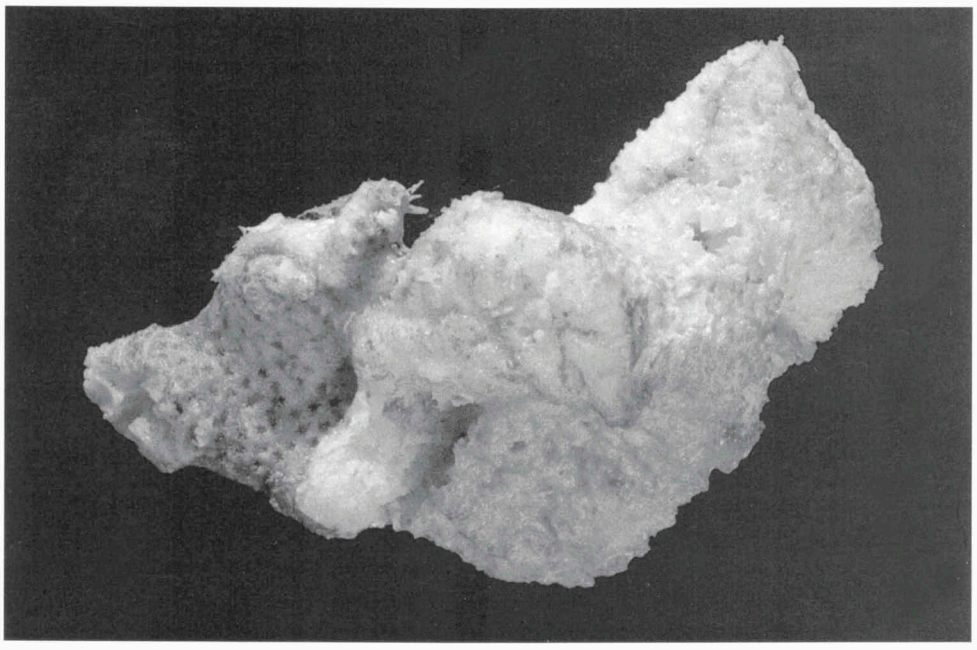

Fig. 1. Holotype of *Desmapsamma vervoorti* spec. nov. (ZMA POR. 8190), photo L.A. van der Laan.

Microscleres in two size categories of anchorate-spatulate chelae (figs 2E, 3B-C), I: 18-*19.5*-21 μm (holotype and paratypes); II: 10-*11.8*-13 μm (holotype and paratypes). Three size categories of sigmas (figs 2D, 3D-E), I: 33-*36.6*-40 μm (holotype and paratypes); II: 18-*23.5*-29 μm (holotype and paratypes); III: 12-*13.9*-15 (holotype and paratypes).

Skeleton.— Ectosomal skeleton (fig. 2A) an isotropic reticulation of oxeas and sand grains, in variable quantities. In the holotype the sand coat is relatively light and spicules are readily recognized, in other specimens the coat is much thicker and consists almost entirely of a sand reticulation. Microscleres at the surface are predominantly the smallest categories of chelae and sigmas. The choanosomal skeleton (fig. 2B) also is basically an isotropic arrangement of tracts consisting of 2-5 oxeas, in places encrusted or strengthened by sand grains and broken spicules. The reticulation is rather irregular and occasionally confused. Sand grains are less dominant than at the surface.

Ecology.— In shallow water, from the intertidal zone down to 45 m; it is apparently common in sedimented reef areas, where it encrusts dead and possibly also live corals.

Distribution.— Indonesia, South China Sea, southern Japan, North-East Australia, East Africa.

Etymology.— Named in honour of Prof. Dr W. Vervoort on the occasion of his 80th birthday in acknowledgment for his contributions to our knowledge of marine invertebrate biodiversity.

Discussion.— The new species is very similar in microscopical characters to the

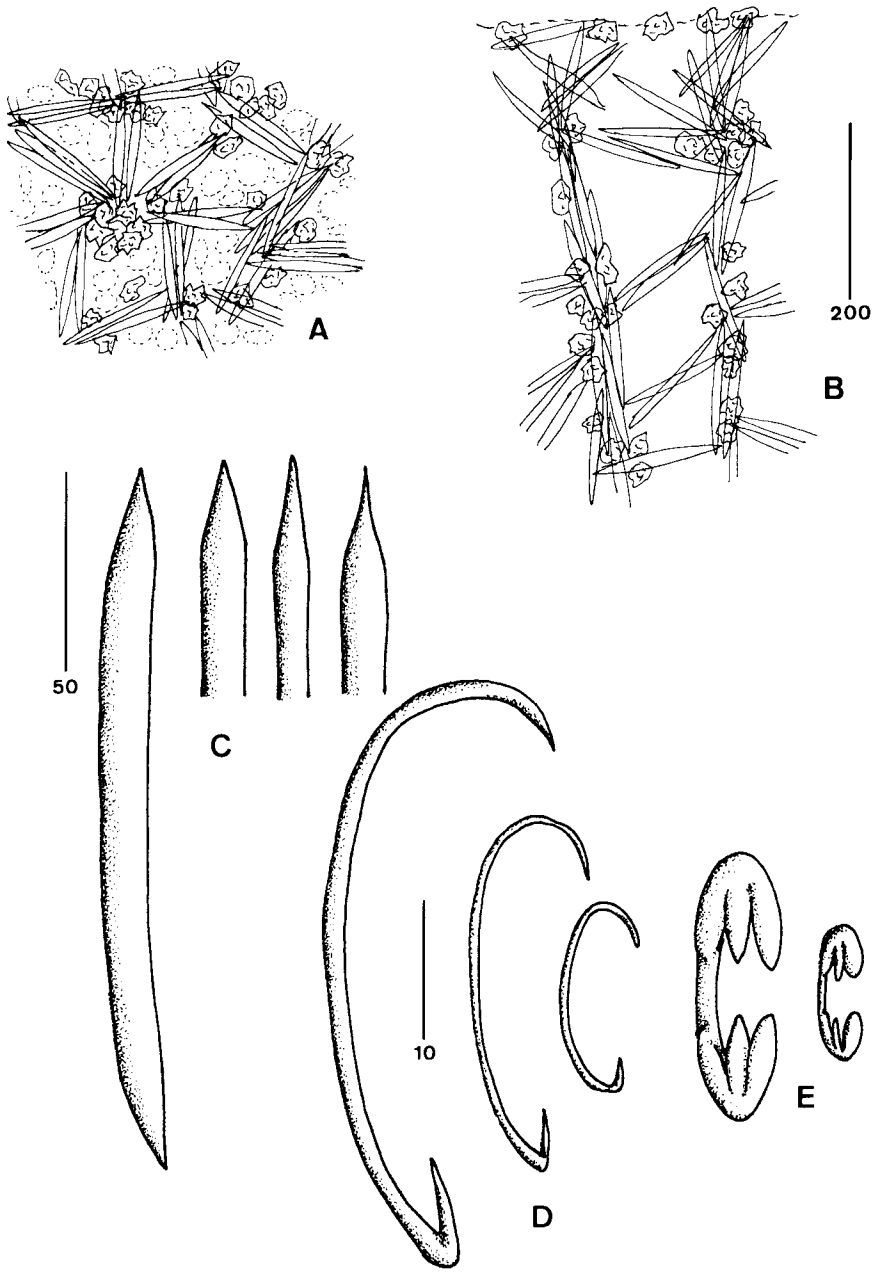

Fig. 2. Drawings of microscopical details of *Desmapsamma vervoorti* spec. nov. A, view of ectosomal skeleton showing the reticulation of oxeas and sand grains; B, choanosomal skeleton in section perpendicular to the surface, showing the reticulation of oxeas and sand grains; C, representative oxea and alternative morphologies of the apices observed in a spicule slide of the holotype; D, three size categories of sigmas; E, two size categories of spatulate anchorate isochelae.

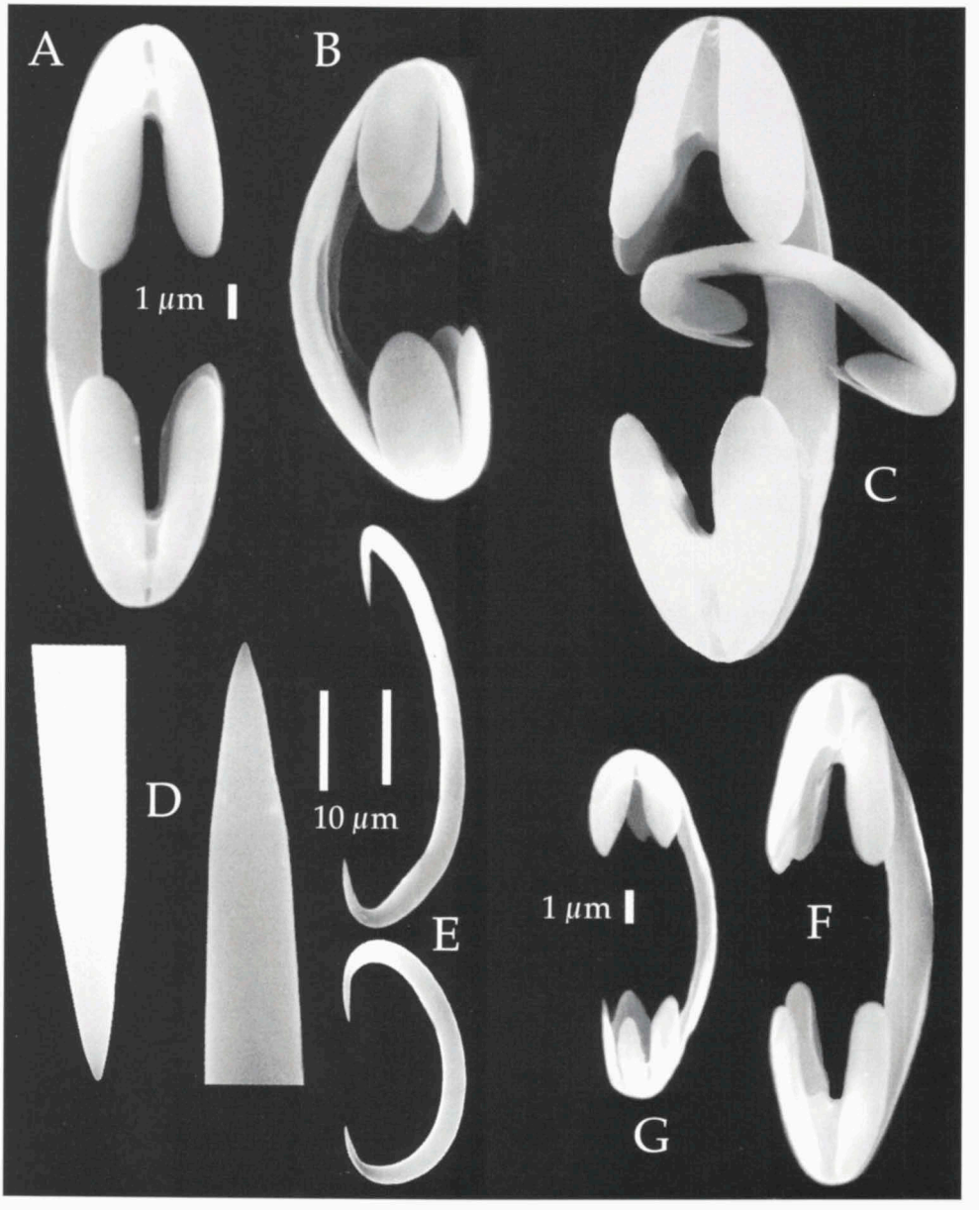

Fig. 3A-E. SEM photos of spicules of *Desmapsamma vervoorti* spec. nov. A, large anchorate isochela; B, small anchorate isochela; C, a larger and a smaller category of anchorate isochelae; D, opposite apices of the same oxea; E, sigmas, F-G: SEM photos of isochelae of *Desmapsamma anchorata* from Curaçao (ZMA POR. 10755).

western Atlantic *Desmapsamma anchorata* (Carter, 1882). However, the geographic separation makes conspecificity of the Indo-Pacific and Caribbean populations unlikely under any species concept other than a strictly morphological one. Moreover, a close comparison with western Atlantic specimens in the ZMA collection revealed the following differences:

Colour: Western Atlantic specimens invariably show shades of pink or pinkish orange, whereas the Indonesian specimens are brownish or greyish.

Surface: Smooth in western Atlantic specimens, rough in Indonesian specimens.

Oscules: Large and often on volcanoe-shaped lobes in western Atlantic specimens, inconspicuous and flush, with star-shaped canals leading to them in Indonesian specimens.

Oxeas: 144-*165*-190 × 5 μm in western Atlantic specimens, 150-*200*-213 × 8.5 μm in Indonesian specimens, thus overlapping but with significantly different average.

Sigmas: Two size categories in western Atlantic specimens, three in Indonesian specimens.

These differences, though seemingly trivial when considered separately, in combination indicate that there are at least two closely related but clearly different species, *D. anchorata* and *D. vervoorti* spec. nov.

According to Hooper & Wiedenmayer (1994) a third species of *Desmapsamma, D. turbo* (Carter, 1885; as *Holopsamma*), may exist in South Australia. Its original description mentions no spicules, its skeleton being entirely built from sand grains. Dendy (1896) claimed to have found tiny chelae and thin styles in a fragment of Carter's specimen in the British Museum, on the basis of which he assigned it to *Esperiopsis*, a genus of the Mycalidae, suborder Mycalina. The assignment to *Desmapsamma* by Hooper & Wiedenmayer (1994) was not explained and must therefore be considered tentative.

The assignment of Tanita & Hoshino's (1990) specimens from Sagami Bay, Japan, to our new species is not certain, because the oxea size quoted by these authors (110-125 μm) is far below the size found in our specimens; also the authors do not mention the presence of sand grains in their description. It is possible that their material belongs to a genuine *Desmacidon* species.

The coasts of West Africa also harbour populations of sponges identified as *Desmapsamma anchorata* (cf. Burton, 1956; Lévi, 1959; Van Soest, 1993). The colour (dark brown) of live specimens from the Cape Verde Islands is different from those from the Caribbean, but this may be due to the predominance of volcanic sand in the Cape Verde Islands. The overall shape with oscules on volcanoe-shaped lobes is similar to the shape of Caribbean specimens. For the time being it is therefore assumed that the West African specimens are conspecific with those from the Caribbean.

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References

Burton, M., 1934. Sponges.— Great Barrier Reef Exped. 1928-1929 Sci. Repts. 4 (14): 513-621.

Burton, M., 1956. The sponges of West Africa.— Atlantide Rept. 4: 111-147.

Burton, M., 1959. Sponges.— John Murray Exped. 1933-34 Sci. Repts. 10 (5): 151-281.

Carter, H.J., 1882. Some sponges from the West Indies and Acapulco in the Liverpool Free Museum described, with general and classificatory remarks.— Annls. Mag. Nat. Hist. (5) 9: 266-301, 346-368.

Carter, H.J., 1885. Descriptions of sponges from the neighbourhood of Port Philip Heads, South Australia.— Annls. Mag. Nat. Hist. (5) 15: 107-222.

Carter, H.J., 1886. Descriptions of sponges from the neighbourhood of Port Philip Heads, South Australia, continued.— Annls. Mag. Nat. Hist. (5) 17: 40-53, 112-127, 431-441, 502-516.

Dendy, A., 1896. Catalogue of non-calcareous sponges collected by J. Bracebridge Wilson, Esq., M.A., in the neighbourhood of Port Philip Heads.— Proc. Roy. Soc. Victoria 8: 14-51.

Dendy, A., 1905. Report on the sponges collected by Professor Herdman at Ceylon in 1902.— Rept. Pearl Oyster Fish. Gulf of Manaar 3, suppl. 18: 57-246.

Hajdu, E., R.W.M. van Soest & J.N.A. Hooper, 1994. Proposal for a phylogenetic subordinal classification of poecilosclerid sponges. In: R.W.M. van Soest, T.M.G. van Kempen & J.C. Braekman (eds) Sponges in time and space.— Balkema, Rotterdam: 123-139.

Hofman, C.C. & R.W.M. van Soest, 1995. *Lissodendoryx* species of the Indo-Malayan Archipelago (Demospongiae: Poecilosclerida).— Beaufortia 45 (6): 77-103.

Hooper, J.N.A., 1994. Coral reef sponges of the Sahul Shelf - a case for habitat preservation.— Mem. Queensland Mus. 36 (1): 93-106.

Hooper, J.N.A. & F. Wiedenmayer, 1994. Porifera.— Zoological Catalogue of Australia 12: i-xiii, 1-624.

Lamarck, J.B.P.A. de, 1814. Sur les polypiers empâtés.— Ann. Mus. Hist, Nat. Paris 20: 294-312, 370-386, 432-458.

Laubenfels, M.W. de, 1936. A discussion of the sponge fauna of the Dry Tortugas in particular, and the West Indies in general, with material for a revision of the families and orders of the Porifera.— Papers Tortuga Lab. 30: i-iii, 1-225.

Lévi, C., 1959. Campagne de la "Calypso": Golfe de Guinée. Spongiaires.— Ann. Inst. Océanogr. 37: 115-141.

Lindgren, N.G., 1897. Beitrag zur Kennthiss der Spongienfauna des Malayischen Archipels und der chinesischen Meere.— Zool. Jahrb. Abt. Syst. 11: 1-96.

Pulitzer-Finali, G., 1986. A collection of West Indian Demospongiae (Porifera). In appendix, a list of the Demospongiae hitherto recorded from the West Indies.— Ann. Mus. Civ. Soria Nat. Genova 86: 65-216.

Pulitzer-Finali, G., 1993. A collection of marine sponges from East Africa.— Ann. Mus. Civ. Soria Nat. Genova 89: 247-350.

Ridley, S.O. & A. Dendy, 1886. Preliminary report on the Monaxonida collected by H.M.S. Challenger.— Annls. Mag. Nat. Hist. (5) 18: 325-351, 470-493.

Schmidt, O., 1870. Grundzüge einer Spongien-Fauna des Atlantischen Gebietes: i-iv, 1-88.— Engelmann, Leipzig.

Soest, R.W.M. van, 1984. Marine sponges from Curaçao and other Caribbean localities. Part III. Poecilosclerida.— Stud. Fauna Curaçao Caribbe. Isl. 66: 1-167.

Soest, R.W.M. van, 1993. Affinities of the marine Demospongiae fauna of the Cape Verde Islands and tropical West Africa.— Courier Forsch. Inst. Senckenberg 159: 205-219.

Thiele, J., 1899. Studien über pazifische Spongien. II. Über einige Spongien von Celebes.— Zoologica 24 (2): 5-33.

Thiele, J., 1903. Kieselschwämme von Ternate, II.— Abhandl. Senckenb. Naturf. Ges. 25: 933-968.

Topsent, E., 1897. Voyage de MM. M. Bedot et C. Pictet dans l'Archipel Malais. Spongiaires de la Baie d'Amboine.— Rev. Suisse Zool. 4: 425-490.

Tanita, S. & T. Hoshino, 1990. The Demospongiae of Sagami Bay: i-xiii, 1-197.— Biological Laboratory Imperial Household, Japan.