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Acanthotetilla celebensis sp. nov., a new species from North Sulawesi, Indonesia (Porifera: Demospongiae: Spirophorida: Tetillidae)

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Abstract

A new megacanthoxea- bearing tetillid *Acanthotetilla celebensis* sp.nov. (Porifera: Demospongiae: Spirophorida: Tetillidae) is described from North Sulawesi, Indonesia. The new species is compared with all other (four) *Acanthotetilla* species occurring in the Indian Ocean and the West Indies. The new species differs from these other species by the overall morphology, and especially the presence of two sizes of megacanthoxeas. This is the first record of *Acanthotetilla* in Indonesia.

Key words: Porifera, Demospongiae, Spirophorida, Tetillidae, *Acanthotetilla*, new species, Sulawesi, Indonesia

Introduction

Indonesian sponges still pose a considerable challenge to marine taxonomists and ecologists working in this region (Van Soest, 1989; De Voogd *et al.,* 2006). Much of the sponge fauna remains insufficiently known and this hampers scientific endeavours to synthesize knowledge of marine systems for purposes of conservation (e.g. De Voogd *et al.*, 2006; Cleary *et al*., 2005) or responsible exploitation of its components (e.g. De Voogd *et al.,* 2005; de Voogd, 2007). Alpha taxonomic work in this region thus remains a prerequisite for any progress in scientific programs involving sponges. The present contribution is intended as a small step on the way to assess the richness of the Indonesian seas.

The genus *Acanthotetilla* (Porifera: Demospongiae: Spirophorida: Tetillidae) was erected in 1959 by Maurice Burton receiving tetillid sponges with peculiar megacanthoxeas as auxiliary megascleres. The type and only species of the new genus was *A. hemisphaerica* Burton, 1959. In 1964, Lévi described the genus *Acanthocinachyra* for the type species *A. enigmatica* that was distinguished from *Acanthotetilla* by the presence of sigmaspires, which were expressly stated to be absent in *Acanthotetilla* by Burton (1959). This was followed by the description of a second species in *Acanthocinachyra*, viz. *A. seychellensis* Thomas, 1973. Van Soest (1977) re-examined the type species of both genera and synonymized them under *Acanthotetilla* because Burton had obviously overlooked the sigmaspires in his type material. He added a fourth species to the revised *Acanthotetilla*, *A. gorgonosclera* Van Soest, 1977 from Barbados.

In this paper we describe a new megacanthoxea- bearing sponge, *Acanthotetilla celebensis* sp.nov. recently found at a single locality in North Sulawesi, Indonesia. The new species is compared with the other described *Acanthotetilla* species occurring in the Indian Ocean and the West Indies. This is the first record of the genus in the Indonesian archipelago.

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Material and methods

The sponge described below was collected in North Sulawesi (Bunaken Island, Likuan I, depth 14m) by the first author using SCUBA in May 2002. The specimen is preserved in 70 % ethanol and deposited in the sponge collection of the National Museum of Natural History, Leiden (RMNH). The description presented below is based on external morphology, skeletal architecture and shape and size of the spicules. Spicule dimensions are given as the mean length (range of length measurements) x mean width (range of width measurements) of 20 spicule measurements for each type and size category. For study of the skeletal architecture hand-cut tangential sections of the ectosome and perpendicular sections of the choanosome were made. The sections were air-dried, mounted in Durcupan® ACM on a microscope slide, and studied under a Leitz high power light microscope. Spicule preparations were made by dissolving a small piece of the specimen in 100% nitric acid (HNO_3), after which the residue was rinsed four times with water, once with 96% ethanol. The spicules were air-dried on microscopic slides and prepared for study with the light microscope by mounting them in Durcupan® ACM, as well as put on aluminium stubs and coated with gold for study with a Jeol Scanning Electron Microscope (SEM).

The classification used here follows the Systema Porifera (Hooper & Van Soest, 2002).

Systematic description

Acanthotetilla celebensis sp. nov. (Fig. 1A-J)

Material examined. Holotype RMNH POR. 2877, Indonesia, North Sulawesi, Bunaken Islands SW, Likuan I, 01º 35.731'N 124º 46.129'E; 14 m., coll. N.J. de Voogd, #MD17/220502/137, 22-05-2002.

Description. Shape: semiglobular, hemispherical, cavernous inside. Size of the holotype is 10 x 12 cm. Surface: hispid bristly, a thin layer of sand covers the surface, obscuring oscules. Only a single porocalyx was observed. Texture: tough, hard, incompressible. Colour: yellow, cream-yellow in spirit

TABLE 1. Measurements (µm) of the spicules of the species of *Acanthotetilla.*

	Oxeas	Protriaenes		Anatriaenes		Acanthoxeas	Sigmaspires
		Shaft	Clads	Shaft	Clads		
A. hemisphaerica Burton, 1959	3100–3812–4400 24–29.9–35	1000–1920–2520 6–10–14	30–38–56 6–8–10	1260–1450–1600 9–9.5–10	55–70–80 9	325–372–414 40–46.4–60	9–11–13
A. enigmatica Lévi, 1964	2200–2960–3800 14–25.1 –30	2000–2500–3000 9	50–68–95 9	3000	50–70	211–225.8–244 16–19.5–23	8–9.6–11
A. seychellensis Thomas, 1973	I.1400–1516–1680 34–37.8–47 II.740–1138–1260 6–10.9–14	360–907–1880 1.5–2.5–4	20–38–50 1.5–3–4	–	–	212–278.4–322 4–8–9	8–10.3 –12
A. gorgonosclera Van Soest, 1977	770–1216–1600 3–13.2–17	1260–1377–1540 4–5.3 – 9	41–63–81 3–4.1–7	– 5–5.5–6	42–53–64 4–5–6	228–281.1–371	9–13.1–16
A. celebensis sp. nov.	1763–1923–2123 20–31–33	1248 7	40–45–50 34	1977 22	45–52–60 4–4.5–5	I. 300–405–442 20–25–33 II. 199–257–284 10–15–17	8–10–12

Skeleton. The peripheral skeleton shows cortical specialization conforming to the description of the type species as presented in the Systema Porifera, i.e. consisting of a dense palisade of megacanthoxeas, visibly macroscopically by a white outerzone. The skeleton is radiate, composed of oxeas, rare very thin anatriaenes and even rarer protriaenes intermingled with megacanthoxeas protruding the surface. The skeleton is less dense interiorly, with megacanthoxeas and sigmaspires as the main spicules present.

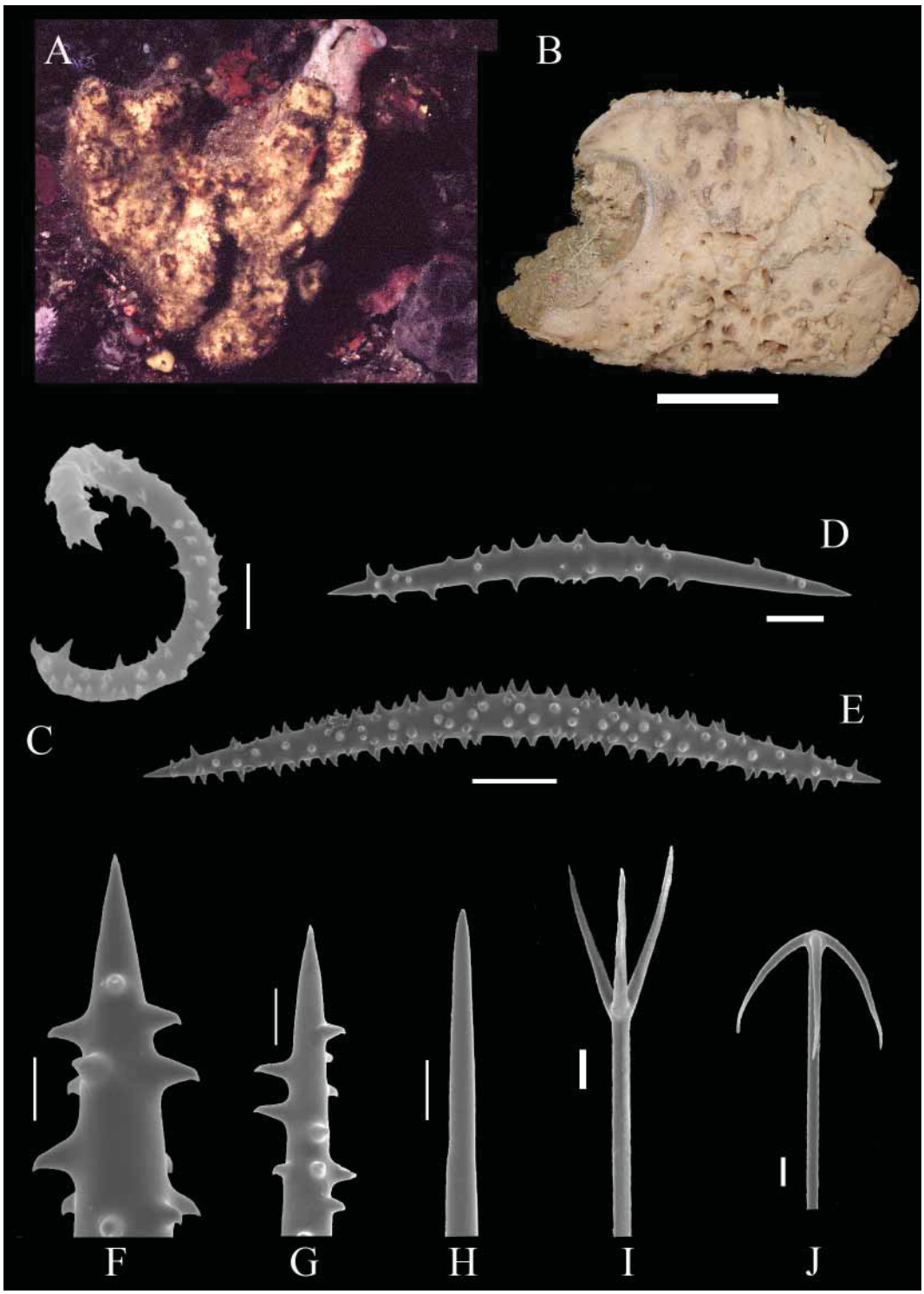

FIGURE 1. A. *Acanthotetilla celebensis* sp.nov., in situ photograph of holotype photo N.J. de Voogd; B. *Acanthotetilla celebensis* sp.nov., preserved specimen of holotype showing the choanosome (scale bar = 3 cm); C. sigmaspire, (scale bar = 2 µm); D. megacanthoxea, (scale bar = 20 µm); E. megacanthoxea, (scale bar = 50 µm); F, G. detail of same, (scale bar = 10 µm); H. oxea, (scale bar = 20 µm); I. protriaene, (scale bar = 10 µm); J. anatriaene, (scale bar = 20 µm).

Spicules. Megascleres: Large smooth oxeas: 1923 (1763–2132) x 31 (20–33) µm. Protriaenes: 1248 x 7 µm (cladi 45 x 4.5 µm*)*. Anatriaenes: 1977 x 22 µm (cladi 52 x 4.5 µm). Two size categories of thickly spined curved megacanthoxeas with spines arranged in irregular whorls; I 405 (300–442) x 25 (20 x 33) µm; II 257 (199–284) x 15 (10–17) µm. Microscleres: Abundant microspined sigmaspires: 10 (8– 12) x 1.5 (1–2) µm

Ecology. Reef wall at a depth of 14 m.

Geographic distribution. Only recorded from the type locality

Etymology. Named after the island of Sulawesi, formerly known as Celebes.

Discussion

In this paper we describe a new sponge from Indonesia belonging to the genus *Acanthotetilla. A. celebensis* sp. nov. is characterized by two size categories of megacanthoxeas. Only four other species belonging to *Acanthotetilla* have presently been described: *A. enigmatica* (Lévi, 1964) from Mozambique, *A. gorgonosclera* van Soest 1977 from Barbados, *A. hemisphaerica* Burton, 1959 from Oman, and *A. seychellensis* (Thomas, 1973) from the Seychelles. The species are all irregularly shaped or semiglobular, but differ in the size and morphology of the spicules. *A. enigmatica* possesses distinct collars of projecting spicules surrounding the porocalices. This species differs from *A. celebensis* sp. nov. by having only small megacanthoxeas in a single size category and very large oxeas. *A. gorgonosclera* is the only described species from the Atlantic Ocean and has significantly larger sigmaspires than the other *Acanthotetilla* species, including our new species. The oxeas are much smaller than the oxeas of *A. celebensis* sp. nov. and megacanthoxeas are in a single size category. *A. hemisphaerica* differs from *A. celebensis* sp. nov. by the presence of very stout megacanthoxeas in a single size category and very large oxeas. In addition, *A. hemisphaerica* also has numerous circular pits (porocalices) free of projecting spicules, whereas only a single porocalice was observed in our new species. *A. seychellensis* is distinguised by the presence of very thin megacanthoxeas and two size categories of oxeas.

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References

Burton , M. (1959) Sponges. Pp. 151–281. *In:* Scientific Reports. John Murray Expedition, 1933–1934.

Cleary, D.F.R., Voogd, N.J. de, Becking, L.E., Renema, W., Beer, M. De, Soest, R.W.M. Van, & Hoeksema, B.W. (2005) Variation in the diversity and composition of benthic taxa as a function of distance offshore, depth and exposure in the Spermonde Archipelago. *Estuarine, Coastal and Shelf Science*, 65, 557–570.

Hooper, J.N.A. & Soest, R.W.M. Van (2002) *Systema Porifera. A guide to the classification of sponges.* Volume 1, Kluwer Academic/ Plenum Publishers New York, Boston, Dordrecht, London, Moscow, xlvii, 1708.

Lévi, C. (1964) Spongiaires du canal de Mozambiques. *Bulletin du Muséum national d'Histoire naturelle*, 36(3), 384–395.

Thomas, P.A. (1973) Marine Demospongiae of Mahe Islands in the Seychelles Bank (Indian Ocean). Annales du Musée royal del'Afrique centrale. Série in 8vo. *Sciences zoologiques*, (203), 1–96, pls 1–8.

Soest, R.W.M. Van (1977). A revision of the megacanthoxea-bearing tetillids (Porifera, Spirophorida). *Studies on the Fauna of Curacao and other Caribbean Islands 53: 1–14, pls I–IV.*

Soest, R.W.M. Van (1989). The Indonesian sponge fauna: A status report. *Netherlands Journal of Sea Research*, 23, 223–230.

Voogd, N.J. De (2007) The mariculture potential of the Indonesian reef-dwelling sponge *Callyspongia (Euplacella) biru*: growth, survival and bioactive compounds. *Aquaculture*, in press.

Voogd, N.J. De, Cleary, D.F.R., Hoeksema, B.W., Noor, A. & Soest, R.W.M. Van (2006). Sponge beta diversity in the Spermonde Archipelago, Indonesia. *Marine Ecology Progress Series*, 309, 131–142.

Voogd, N.J. De, Haftka, J.J.H. & Hoeksema, B.W. (2005) The ecological function of amphitoxin in the reef-dwelling sponge *Callyspongia (Euplacella) biru* (Haplosclerida: Callyspongiidae) at SW Sulawesi, Indonesia. *Contributions to Zoology*, 74, 51–60.