

***Callyspongia (Euplacella) biru* spec. nov.**  
**(Porifera: Demospongiae: Haplosclerida) from Indonesia**

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Voogd, N.J. de. *Callyspongia (Euplacella) biru* spec. nov. (Porifera: Demospongiae: Haplosclerida) from Indonesia.

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A new sponge species *Callyspongia (Euplacella) biru* spec. nov. is described from various locations within Indonesia (NE Bali, SW & NE Sulawesi and NE Kalimantan). The species is assigned to the subgenus *Euplacella* of the genus *Callyspongia* because it has brushes of spicules on the nodes of its double-meshed ectosomal skeleton. The species is discussed and compared with relevant *Callyspongia* records from other Indonesian and neighbouring Indo-Pacific areas.

### Introduction

The family Callyspongiidae was erected in 1936 by de Laubenfels and receives haplosclerid sponges which have a two-dimensional ectosomal skeleton of primary, secondary and sometimes tertiary fibres (Desqueyroux-Faundeze & Valentine, 2002). This family currently contains 4 valid genera and 4 subgenera within the genus *Callyspongia*. Species of the genus *Callyspongia* are conspicuous and beautifully coloured sponges on Indonesian shallow-water coral reefs. Although approximately 45 species have been described from Indonesia up till now, many more await description (van Soest, 1989). The lack of discriminating characters within the order Haplosclerida and the large variability of the structural characters within the Callyspongiidae (Desqueyroux-Faundeze, 1999) have resulted in many junior names and confusion. Because of this, new descriptions of callyspongiid species preferably should be based on ample material to allow investigation of intraspecific variation. In a study on the farming success of some bioactive sponges in the Spermonde Archipelago, SW Sulawesi, a striking blue branching sponge was used as a target species (de Voogd et al., 2004). This is a common species in this region (de Voogd et al., submitted) and it also was collected subsequently from various other locations within Indonesia (NE Bali, NE Sulawesi, and NE Kalimantan). Despite its conspicuousness, I did not encounter a matching description in the literature, and accordingly I describe it here as a species new to science. The new species is compared with Indo-Pacific *Callyspongia* species with a similar morphology.

### Material and methods

The material was collected by SCUBA diving by B.W. Hoeksema and the author from various locations within Indonesia. A selection of the material is preserved in 70%



Fig. 1A. *Callyspongia (Euplacella) biru* spec. nov. In situ photograph of holotype (ZMA POR. 15222). Photo: B.W. Hoeksema.



Fig. 1B. *Callyspongia (Euplacella) biru* spec. nov. Preserved specimen (ZMA POR. 15222). Photo: N.J. de Voogd (scale bar = 5 cm).

ethylalcohol and deposited in the collections of the Zoological Museum Amsterdam (ZMA) and the National Museum of Natural History, Leiden (RMNH), but many more specimens were routinely studied in other scientific projects. Examination of the specimens included study of the external morphology, skeletal architecture, and size and shape of the spicules. For the study of the skeletal architecture hand-cut tangential sections of the ectosome, and perpendicular sections of the choanosome were made. Spicule size data are based on at least 25 units, are presented as lower range–mean–upper range of length  $\times$  width.

## Systematics

### Phylum Porifera

#### Class Demospongiae

#### Order Haplosclerida Topsent, 1928

#### Suborder Haplosclerina Topsent, 1928

#### Family Callyspongiidae de Laubenfels, 1936

#### Genus *Callyspongia* Duchassaing & Michelotti, 1864

#### Subgenus *Euplacella* Lendenfeld, 1887

*Callyspongia* (*Euplacella*) *biru* spec. nov.

(figs 1A-B, 2A-D)

Material.— Holotype: ZMA POR. 15222, Indonesia, SW Sulawesi, Samalona; 05°07'S 119°20'E; 8 m, 04.v.1997, coll. B.W. Hoeksema, # BH97/0405/007.

Paratypes.— ZMA POR. 13306, Indonesia, SE Sulawesi, Kudingareng Keke; 05°6'9"S 119°17'9"E; 8 m, 30.iv.1997, coll. N.J. de Voogd, # NV/300497/5-II; ZMA POR. 13276, Indonesia, SE Sulawesi, Kudingareng Keke; 05°6'9"S 119°17'9"E; 12 m, 7.iv.1997, coll. N.J. de Voogd, # NV/070497/17; ZMA POR. 13287, Indonesia, SE Sulawesi, Kudingareng Keke; 05°6'9"S 119°17'9"E; 15 m, 24.iv.1997, coll. N.J. de Voogd, #NV/240497/14; ZMA POR. 14467, Indonesia, SW Sulawesi, Bone Lola; S 05°03' E 119°21'; 8 m, 24.iv.1998, coll. B.W. Hoeksema, SYMBIOSPONGE # 98/SS/APR24/BH/020; RMNH POR. 1451, Indonesia, SE Sulawesi, Samalona; 05°07'S 119°20'E; 12 m, 25.xi.2002, coll. N.J. de Voogd, # NV/SA/251102/108-372; RMNH POR. 1447, Indonesia, Bali, Tulamben Beach; 08°16'26"S 115°35'28"E; 11.iv.2000, coll. N.J. de Voogd, # NV/Bal.21/110400/127; RMNH POR. 1448, Indonesia, Bali, SE Tulamben Beach; 08°16'40"S 115°35'45"E; 11.iv.2000, coll. N.J. de Voogd, # NV/Bal.22/110400/141; RMNH POR. 1449, Indonesia, Bali, Tulamben; 08°17'05"S 115°36'11"E; 15 m, 15.iv.2000, coll. N.J. de Voogd, # NV/Bal.23/150400/210; RMNH POR. 1450, Indonesia, NE Sulawesi, SW Bunaken Island, Likuan III; 01°35'736"N 124°46'146"E; 12 m, 12.v.2002, coll. N.J. de Voogd, # MD5/120502/021; RMNH POR. 1452, Indonesia, NE Kalimantan, Sangalaki N; 02°05'25"N 118°24'17"E; 6 m, 08.x.2003, coll. N.J. de Voogd, # Ber12/NV/081003/074.

Shape and size.— Repent-ramose; basally encrusting but forming single erect branches or masses of rounded, occasionally bifurcating branches. The longest observed branch is up to 40 cm, branching masses may be 10-150 mm in diameter. Oscules sometimes slightly elevated, numerous, distributed across the branches, diameter 0.5-2 mm in diameter (fig.1 A-B). Copious slime is exuded when pressed or cut.

Colour.— Bright blue, fawn in alcohol.

Surface.— Optically smooth. Microhispid.

Consistency.— Spongy, typically *Callyspongia*-like.

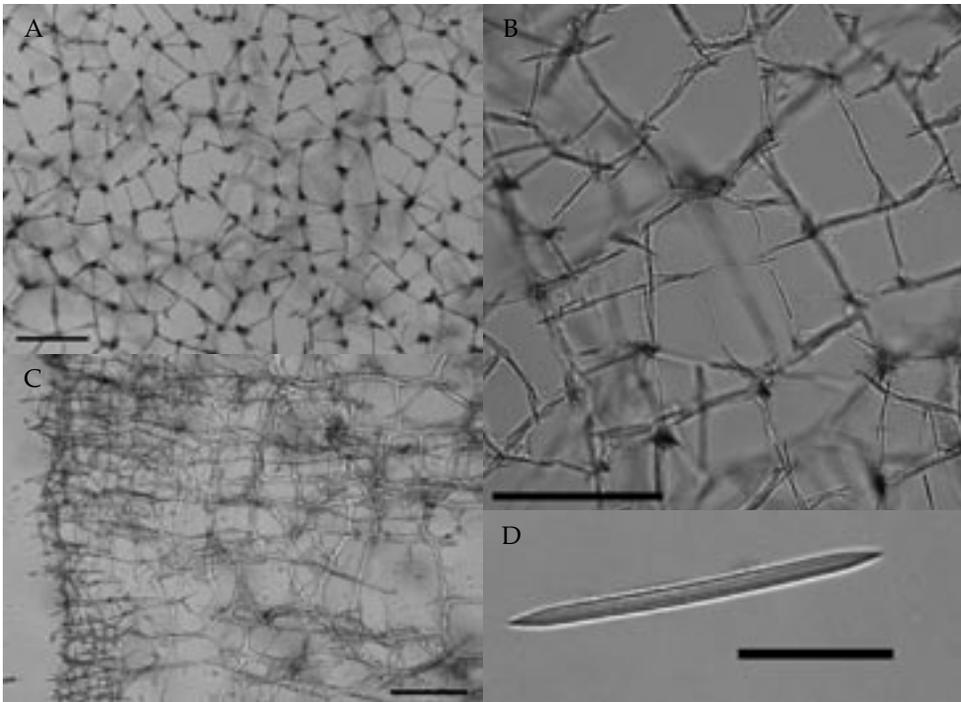


Fig. 2. *Callyspongia (Euplacella) biru* spec. nov. A, tangential view of ectosomal skeleton (ZMA POR. 14467), B, (RMNH POR. 1451), C, cross section of choanosomal skeleton (RMNH POR. 1450). D, oxea (ZMA POR. 13306). Scale bars A = 500  $\mu$ m, B = 200  $\mu$ m, C = 400  $\mu$ m, D = 30  $\mu$ m.

**Skeleton.**— Ectosomal skeleton is a regular tangential reticulation of rounded to rectangular meshes ( $82 \times 95$  up to  $118 \times 142$   $\mu$ m), forming an indistinct 'double-meshed' network with little distinction of thicker and thinner fibres, and larger and smaller meshes. The nodes of the ectosomal network bear small spicule brushes and spicule tracts from the choanosomal skeleton protrude the surface (fig. 2A-B). Peripheral condensation is present by vertical subdivision of the primary fibres and of the subectosomal interconnecting fibres. The choanosomal skeleton is a regular network of primary longitudinal multispicular sponge fibres connected at a right angle by unispicular secondary fibres forming rectangular meshes ( $118 \times 165$   $\mu$ m to  $118 \times 230$   $\mu$ m) (fig. 2C). The primary fibres (140-175  $\mu$ m) are cored by approximately 3-5 spicules. The secondary fibres (100-120  $\mu$ m) are cored by single oxeas.

**Spicules.**— Straight oxeas with abruptly pointed ends. Dimensions  $74 - 82 - 89 \times 3 - 5 - 6$   $\mu$ m (fig 2D).

**Ecology.**— The encrusting form is often growing on dead and live substrates. The cylindrical branches are often intertwined with other branch-forming species (*Clathria cervicornis*, *Clathria reinwardti* and *Amphimedon paraviridis*). Barnacles and bivalves often inhabit this species.

**Distribution.**— Throughout Indonesia (Kalimantan, Bali, Sulawesi).

Bioactivity— The sponge crude extract is strongly active against brine shrimp larvae (LC50 > 1 mg/L).

Etymology.— *Biru* is the Indonesian word for blue.

## Discussion

The classification of the Callyspongiidae was recently revised in "Systema Porifera" (Desqueyroux-Faundez & Valentine, 2002), including a proposal for the use of well-delimited subgenera *Euplacella*, *Toxochalina*, *Cladochalina*, *Cavochalina*, within the genus *Callyspongia*. The present new species of *Callyspongia* is assigned to the subgenus *Euplacella* based on the echinating ectosomal brushes and the possession of three distinct growth layers.

Callyspongiidae is a large family with a worldwide distribution. Approximately 45 *Callyspongia* species have been described from Indonesia, including some originally described under different generic names, such as *Siphonochalina*, *Pachychalina*, *Dactylochalina*, *Toxochalina* and *Spinosella*. Describing a single species within this speciose genus with its many junior names may be considered hazardous. However, the current species has a very specific morphology and not many species belonging to the subgenus *Euplacella* have been described. To limit the discussion, only species, which are similar in habit, are discussed here.

*Callyspongia* (*Callyspongia*) *pseudoreticulata* (Desqueyroux-Faundez, 1984) forms dark brown to black bifurcating erect branches. This species was originally described from New Caledonia but was recently recorded from the Great Barrier Reef (Fromont, 1993) and at various locations within Indonesia (Braekman et al., 2003). This species clearly differs from the new species in overall morphology, skeletal characters and size and shape of the spicules (thin blunt strongyloxeas measuring 50-65 µm). Another branching New Caledonian species *Callyspongia fruticosa* (Desqueyroux-Faundez, 1984), differs from *C. biru* by its colouration, numerous bush-like branches, the oscules are distributed on only one side of the branches and the spicules are strongyles of similar dimension (75-80 × 0.5 µm). The author compared it with the closely related species *Callyspongia subarmigera* (Ridley, 1884) and *Callyspongia reticulis* var. *salomonensis* (Dendy, 1905). The first species clearly belongs to the subgenus *Cladochalina* and has occasional ectosomal spines and is more related to the Caribbean *C. armigera* (Duchassaing & Michelotti, 1864). The second species forms decumbent branches, but has straight small strongyles (70-75 µm).

Ridley (1884) described various *Callyspongia* species, which were collected during the voyage of H.M.S. "Alert" in the Indo-Pacific. *C. monilata* (Ridley, 1884) was originally described as a *Chalina*; the author described a very thin dichotomously branching necklace-like sponge (with a swelling every 8-10 mm). This species clearly differs from *C. biru* by the sizes of the oxeas (100 × 10 µm), the diameter of the branches, and the necklace-like swelling. *Callyspongia* (*Cladochalina*) *nuda* (Ridley, 1884) is a decumbent, slender tortuous sponge, which according to the author is most similar to *C. subarmigera* but without spines. The spicules are fairly large (115 µm). *Callyspongia elongata* (Ridley & Dendy, 1887) forms digitate ramose branches. The oscules are small and scattered on one side of the sponge, whereas the oscules of the new species are placed across the entire sponge body. The spicules are slightly curved sharply pointed oxeas (100 × 6.5

µm), distinctly different. *C. (?Chalina) megalorrhaphis* (Ridley & Dendy, 1886) is an anastomosing cylindrical branch with uniserial oscules. The authors remark that this species has unusual large oxeas ( $245 \times 16 \mu\text{m}$ ) for a Chalinae sponge, unlike the oxeas of the new species.

Dendy (1905) described *Callyspongia* (as *Pachychalina*) *subcylindrica* from the Gulf of Manaar, Sri Lanka. This is an elongated, irregularly cylindrical branch with numerous vents, which have a prominent margin. Dendy remarked that the feeble development of spongin places this species in an intermediate position between *Petrosia* and *Chalina*. According to his description of the meshed network of the dense multispicular fibres and his remarks, this species is likely to be a *Amphimedon* (Niphatidae). Moreover, the oxeas are fairly large ( $140 \times 8 \mu\text{m}$ ).

*Callyspongia samarensis* (Wilson, 1925 as *Chalinodendroin exiguum*) forms thin (2-3 mm) long, intertwining dichotomous branches. This habit and skeleton clearly differs from *Callyspongia (Euplacella) biru* spec. nov.

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