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A NEW SPECIES OF *CLADOCROCE* TOPSENT, 1892 (PORIFERA, HAPLOSCLERIDA) FROM THE GULF OF THAILAND

SUMAITT PUTCHAKARN*, WALLIE H. DE WEERDT**, PICHAI SONCHAENG*
& ROB W.M. VAN SOEST**

**Institute of Marine Science, Burapha University, Bangsaen, Chonburi 20131 Thailand.*
E-mail: sumaitt@bims.buu.ac.th; pichai@bims.buu.ac.th

***Zoological Museum, University of Amsterdam, P.O. Box 94766, 1090 GT Amsterdam,*
The Netherlands. E-Mail: weerd@science.uva.nl; soest@science.uva.nl

ABSTRACT

A new sponge species, *Cladocroce burapha* n. sp. (Chalinidae, Haplosclerida, Porifera), is described from Chonburi province, eastern coast of the Gulf of Thailand, Thailand. The new species can be separated from other *Cladocroce* species by a combination of characters, including growth form, form and size of the spicules, and habitat. This is the first record of the genus *Cladocroce* from Thailand.

Key words: Porifera, Haplosclerida, Chalinidae, *Cladocroce*, Gulf of Thailand, new species

INTRODUCTION

The Gulf of Thailand is situated between latitudes 05°00' and 13°30' N and longitudes 99°00' and 106°00'E, and constitutes a portion of the shallow Sunda shelf which opens to the South China Sea. In the course of the marine biodiversity research project of the Institute of Marine Science, Burapha University, sponges were collected in several localities and marine habitats along the coast of the Gulf of Thailand for the purpose of investigating the diversity and distribution of the demosponges along the Gulf of Thailand. Several of these sponges appear new to science and in ongoing series of publications we will describe these. The present study deals with a

new species of *Cladocroce*, *C. burapha* n. sp. It was given the name to honor Burapha University for support of this study.

Cladocroce Topsent, 1892 is recognizable among Chalinidae by the choanosomal skeleton which is built up by multispicular fibers with a (sub)-isotropic, unispicular reticulation in between. It is a rare, hitherto somewhat ill-known genus, with five species described from deep water, and two from shallow-water habitats. The deep-water species are *Cladocroce fibrosa* Topsent, 1892, *C. incurvata* Lévi & Lévi, 1983, *C. gaussiana* (Hentschel, 1914), *C. spathiformis* Topsent, 1904, and *C. osculosa* Topsent, 1927. The shallow-water species are *C. aculeata* Pulitzer-Finali, 1982, and *C. tubulosa* Pulitzer-Finali, 1993. The characteristics

of the genus were reviewed by Fromont, 1993, and the species were revised by De Weerd, 2002.

MATERIALS AND METHODS

Sponge specimens were collected using SCUBA diving and wading from various habitats including intertidal and sublittoral zones of rocky shores, and man-made structures such as concrete columns of fishing piers, the jetty of Thailoil Refinery, and the crab gill net landings in Chonburi and Rayong province. Collecting was done during 1999-2003 by Sumaitt Putchakarn, Biodiversity Research Unit, Burapha University. Specimens were photographed in situ before preservation in 70% alcohol.

For microscopical studies, tangential and perpendicular sections were made with a scalpel; the sections were dried on a hotplate, subsequently mounted in Canada balsam, and examined using 100-400x magnification. Furthermore, a fragment of approx. 5 mm³ was cooked in concentrate nitric acid, the residue was washed and centrifuged 3 times in distilled water and 3 times in 95% alcohol, then suspended in 95% alcohol. Spicule suspensions were pipetted on microscopic glass slides; the dried spicules were mounted in Canada balsam for light microscopy. Spicule size data are based on 25 measurements of randomly chosen spicules.

SYSTEMATIC DESCRIPTION

Order Haplosclerida Topsent, 1928
Family Chalinidae Gray, 1867
Genus *Cladocroce* Topsent, 1892

Cladocroce Topsent, 1892: 72, pl. III figs 1,2.

TYPE SPECIES. - *Cladocroce fibrosa* Topsent, 1892 (by monotypy).

SYNONYMS. - *Cladocroce* Topsent, 1892: 72, *Toxiclona* De Laubenfels, 1954: 73.

DIAGNOSIS (modified from De Weerd, 2002). - Sponges lamellate or tube-shaped. Choanosomal skeleton a (sub)isotropic, uni-paucispicular reticulation, reinforced by occasionally anastomosing multispicular fibres. Ectosomal skeleton, if pre-

sent, a tangential, uni- or paucispicular, iso- or subisotropic reticulation. Megascleres smooth oxeads. Microscleres, if present, toxas. Colour grey, salmon pink, mauve or ochre. Surface smooth, sometimes conulose. Consistency firm but elastic, compressible. In the lamellate forms, the oscules are circular, flush with the surface, rather small, not abundant; they may occur at both sides of the lamellae.

***Cladocroce burapha* n. sp.**

Figs. 1A-E

MATERIAL. - Holotype: BIMS-I1382, in spirit, Laemthan, Bangsaen beach, Chonburi province, eastern coast of the Gulf of Thailand, Thailand, rocky shore, 2 m deep, coll. S. Putchakarn, 15-XII-1999 (BASA-02), specimen deposited at the Institute of Marine Science, Burapha University, Thailand.

Paratype: ZMA Por. 17921, in spirit, Ban-pae fishing pier, Rayong province, eastern coast of the Gulf of Thailand, Thailand, crab gill net, approx. 15 m deep, coll. S. Putchakarn, 26-I-2003 (RU-POR-06), specimen deposited at the Zoological Museum Amsterdam, University of Amsterdam, The Netherlands.

Additional material: BIMS-I1383, in spirit, Thailoils Refinery jetty, Sriraja, Chonburi province, eastern coast of the Gulf of Thailand, Thailand, low tide, coll. S. Putchakarn, 6-VIII-2001 (SARA-01), specimen deposited at the Institute of Marine Science, Burapha University.

DESCRIPTION OF HOLOTYPE. - Shape (Fig. 1A): the holotype is tubulo-ramose, consisting of a cluster of nine short, partly fused tubes ending in an apical osculum; the area below the apices of the tubes is slightly swollen; in a few places sharply pointed proliferations of 2-5 mm length, 0.5-1.5 mm thick arise from the surface. The height of the entire sponge is 5 cm, diameter 3.5 cm; diameter of the individual tubes 0.5-0.8 cm; diameter of the oscula 0.1-0.4 cm. Surface even, smooth. Consistency: moderately soft, compressible but somewhat fragile.

Colour: (Fig. 1A) off-white to light cream with a slight pinkish tinge in life, light tan in spirit. Skeleton: ectosomal skeleton (Fig. 1C): unispicular, isotropic, tangential reticulation.

Choanosomal skeleton (Fig. 1D): somewhat irregular, (sub)isotropic, unispicular reticulation, interspersed by many choanosomal spaces; skeleton reinforced by a coarse reticulation of thick multispicular fibres which stop a short distance from

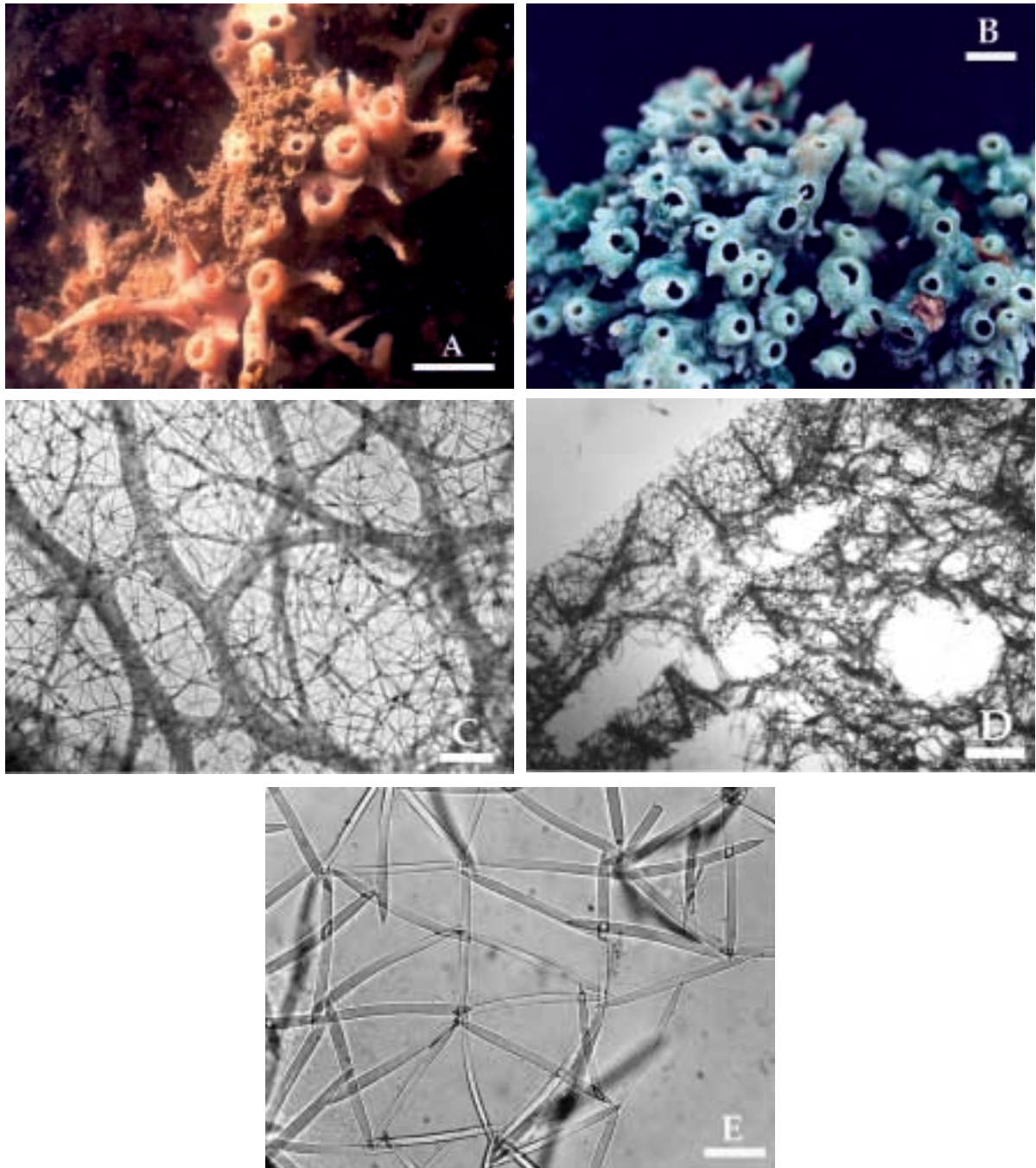


Fig. 1. *Cladocroce burapha* n. sp. A, holotype in situ (photo: S. Putschakarn). B, BIMS-I1383 (photo: S. Putschakarn). C, ectosomal skeleton. D, perpendicular skeleton. E, ectosomal spicules (scale bars: A, B = 1 cm; C = 200 μ m; D = 300 μ m; E = 50 μ m).

the ectosome. Thickness of the fibres 23.5-59 μ m; meshes subcircular to oval, approx. 245 x 250 μ m - 445 x 1000 μ m.

Spicules (Fig. 1E): oxeas with sharp points, 105-109.8-117 μ m x ca. 6 μ m.

HABITAT AND DISTRIBUTION. - The holotype was

found attached on a rock with some sediment cover, in the sublittoral zone of a rocky shore, with more or less turbid water, at a depth of 2 m. The paratype was found in a crab gill-net, offshore, sandy bottom, at approx. 15 m. The third specimen was found on the column of the refinery jetty at low tide. *C. burapha* n. sp. is known

only from the eastern coast of the Gulf of Thailand.

VARIABILITY. - The paratype of our new species has larger oxeas than the holotype, viz. 141-166.8-171 x 6-7.5 μm , whilst the oxeas in BIMS-I1383 are somewhat shorter and thicker, viz. 87.5-99.4-110 x 6-9.5 μm . The differences in colour between the holotype and paratype (off-white to light cream with purplish tinges) and BIMS-I1383 (light blue, Fig. 1B) are also remarkable. However, the three specimens are entirely similar with respect to form, consistency, skeletal architecture and shape of the oxeas. Study of additional specimens may give more insight in the variability in different populations of *C. burapha* n. sp.

ETYMOLOGY. - The species name is derived from the name of Burapha University, Chonburi province, Thailand, in order to acknowledge the support of this study.

REMARKS. - *Cladocroce burapha* n. sp. stands out among other *Cladocroce* by its delicate tubular-ramose growth form. Other *Cladocroce* species are predominantly lamellate or spathiform.

The two other *Cladocroce* species known from shallow water are *C. aculeata* Pulitzer-Finali, 1982, and *C. tubulosa* Pulitzer-Finali, 1993. *C. aculeata* was described from Lizard Island, Great Barrier Reef, with a form consisting of curved lamella, "apparently belonging to a tubular sponge". The size of the spicules is quite similar in the two species, viz. 120-160 x 4-6.8 μm in *C. aculeata*, but the latter species clearly differs from *C. burapha* n. sp. by the much sturdier lamellate-tubular growth form, the presence of thorny processes on the convex face of the lamella, and the blunt-pointed to strongylote spicules, which are sharply pointed in *C. burapha* n. sp.

C. tubulosa was described from Mombasa, East Africa, from 16 m depth, with a form consisting of erect tubes arising from a common base. It differs from our new species by the much thinner spicule tracts of 8-12 μm , smaller meshes of 180-280 μm wide, reinforcement of the skeleton by ascending, dendritic spongin fibres 16-32 μm thick, and much smaller oxeas of 64-74 x 3.5 μm .

The other five *Cladocroce* species all occur in

deep water, and differ from *C. burapha* in the following characters:

C. fibrosa Topsent, 1892 (type species *Cladocroce*) described from the Azores, between Pico and São Jorge, at 1300 m depth, has very large oxeas of 600 x 18 μm . *C. gaussiana* (Hentschel, 1914, as *Siphonochalina*), is an Antarctic deep-water species, with oxeas of 230-285 and toxa of 80-180 μm (Hentschel, l.c., and material in the National Museum of Natural History, Washington DC, and ZMA). *C. incurvata* Lévi & Lévi, 1983, described from New Caledonia from 170-190 m and 400 m depth, has a clearly lamellate, pedicelled growth form and somewhat larger oxeas of 180-220 x 8-10 μm . *C. osculosa* Topsent, 1927, described from the south coast of Portugal from 749-310 m depth, is lamellate, double-faced, with short-pointed oxeas of 225 x 9 μm . Finally, *C. spathiformis* Topsent, 1904, described from the Azores from 1165 m depth, is spathiform with large oxeas of 375 x 17 μm .

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