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Two new cleistocheliferous species of *Clathria* of sciophilous habitats from Northeastern Brazil (Poecilosclerida: Demospongiae: Porifera)

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Abstract

We describe two new species of *Clathria* (*Microciona*) Bowerbank, 1862: *C. (M.) crassitoxa* **sp. nov.** and *C. (M.) trairae* **sp. nov.** from Paraíba State (Northeastern Brazil). All are sciophilous species and are represented by small fragments removed from the substrate. Both new species have cleistochelae, and are compared with their cleistocheliferous congeners, differing from all of them by the possession of different combinations of other megascleres and microscleres.

Key words: sponges, *Clathria*, new species, cleistochelae, Paraíba State, taxonomy, Brazil

Introduction

According van Soest (2009), sciophilous (shaded) marine habitats are characterized by mosaics of small and thinly encrusting faunal inhabitants, notably sponges, bryozoans and colonial tunicates. Sizes of these organisms usually are measured in millimeters rather than centimeters, making sampling and identification often problematic. In sponges in particular, the taxonomy of thinly encrusting specimens is challenging owing to the difficulties in sampling their thin tissue (Zea *et al.* 2014). Thinly encrusting species of *Clathria* Schmidt, 1862 are generally difficult to recognize in the field and from their simple spiculation (Hooper 1996). *Clathria* (*Microciona*) Bowerbank, 1862 have 99 valid described species, however, only two of them are recorded from the Brazilian Coast: *C. (M.) calla* de Laubenfels, 1934 and *C. (M.) campecheae* Hooper, 1996. Neither of these two Brazilian *Clathria* species have cleistochelae (*viz.* isochelae with central teeth (alae) nearly in contact or touching - see Boury-Esnault & Rützler 1997). In total, only nine species of cleistocheliferous *Clathria* are known worldwide, *viz.* *Clathria* (*Microciona*) *bicleistochelifera* van Soest *et al.*, 2013 (from Cape Verde), *C. (M.) cancapseptima* van Soest *et al.*, 2013 (from Cape Verde), *C. (M.) cleistochela* Topsent, 1925 (from Italy), *C. (M.) echinata* (Alcolado, 1984) from Cuba, *C. (M.) elliptichela* (Alander, 1942) from Celtic Seas, *C. (M.) toxirecta* (Sarà & Siribelli, 1960) from Italy, *C. (Clathria) hjorti* (Arnesen, 1932) from Mauritania, *C. (Thalysias) sulfoleistochela* Zea *et al.*, 2014 (from Colombia), and *C. (C.) tortuosa* Uriz, 1988 (from Namibia).

In this paper, we describe two new cleistocheliferous species of *Clathria* (*Microciona*), collected from sciophilous habitats in the coast of the Paraíba State (Northeastern Brazil Ecoregion).

Material and methods

The specimens were collected during a faunistic survey conducted in the area of Baía da Traição city (6°41'19"S, 34°55'60"W), Paraíba State, Brazil (Figure 1). This is an important area for tourism and as such a more comprehensive knowledge of marine life in the region is essential. The specimens studied here were preserved in 92% ethanol. The sponges were deposited in the Coleção de Porifera of Universidade Federal de Pernambuco (UFPEPOR). Dissociated spicule mounts, scanning electronic microscopy (SEM) preparations and skeletal sections were made using classical procedures for Demospongiae (Hajdu *et al.* 2011). Images of specimens,

1960), and smooth tomas (Hooper 2002). In *Clathria*, according van Soest *et al.* (2013), the similarity in cleistochelae micromorphology between all the species is striking and indicates the existence of a possibly related group of species in the Atlantic region transgressing the subgenus boundaries, *e.g.* *Clathria* (*Clathria*) Schmidt, 1862; *Clathria* (*Microcionia*) and *Clathria* (*Thalysias*) Duchassaing & Michelotti, 1864.

Genera such as *Haliclona* Grant, 1836, *Clathria*, and *Mycale*, are common in reef sciophilous habitats (Kobluk & van Soest 1989). For example, van Soest (2009) has shown that sponges inhabiting the undersides of coral rubble and crevices are not just juveniles of more massive species, but comprise a distinct assemblage of sponges. These have been largely over-looked in the past because they are usually cryptic and small, making sampling and identification difficult. These hidden habitats also complicate the collection of specimens, which by necessity has to be by indirect means, and only scuba diving and snorkeling permit an efficient study of these animals. In Brazil, the few studies that been carried out on the sciophilous sponge faunas (see Cedro *et al.* 2013; Santos *et al.* 2014a, b) resulted in the discovery of several species new to science. The two new species described here may be considered ‘moderately sciophilous’, since they occur at very shallow depths in very turbid waters. These sponges are restricted to marine environments with low water movement conditions, which might favor the high fragility of the ‘microcionid’ skeletal structure.

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