



<http://dx.doi.org/10.11646/zootaxa.3838.4.4>

<http://zoobank.org/urn:lsid:zoobank.org:pub:1B077693-C08F-49D6-965A-260D08C566DB>

Dictyoceratida (Porifera: Demospongiae) from Tropical Southwestern Atlantic (Northeastern Brazil, Sergipe State) and the description of three new species

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Abstract

Five species of dictyoceratid sponges were collected from trawling on the continental shelf of Sergipe State, Northeastern Brazil, of which three are new to science: *Ircinia sergipana* **sp. nov.**, *Ircinia repens* **sp. nov.**, *Ircinia strobilina*, *Hyattella cavernosa* and *Smenospongia ramosa* **sp. nov.**, the latter the first record of the genus *Smenospongia* from Brazil.

Key words: Porifera, taxonomy, Sponges, *Ircinia*, *Smenospongia*, Tropical Southwestern Atlantic Ocean, Northeastern Brazil, new species

Introduction

The Order Dictyoceratida Minchin, 1900 comprises five families and 39 genera, characterized by the presence of anastomosed skeleton of spongin fibers, organized in primary, secondary and, sometimes, tertiary elements (Cook & Bergquist 2002a, van Soest *et al.* 2014). The absence of mineral skeleton in this group of sponges reduces the number of morphological characters available, making the use of other characters necessary, such as ecological, biochemical and reproductive characteristics (Bergquist 1980). Dictyoceratid families are easily differentiated, but the distinction between genera and subgenera can be difficult. Thus, several other characteristics need to be precisely described and compared between related species, including skeletal architecture, mucus production and the presence or absence of cortical armour (Cook 2007).

There are 26 dictyoceratid species known on the Brazilian coast, but most of them haven't been recorded since their original descriptions over 100 years ago (e. g. Hyatt 1877, Poléjaeff 1884, Lendenfeld 1889), and a revision of this material is sorely needed. In Sergipe State, 13 species of marine sponges were recorded (Muricy *et al.* 2011, Sandes & Pinheiro 2013, Sandes *et al.* 2014), but only two of these species belong to dictyoceratids: *Hyattella cavernosa* (Pallas, 1766) and *Ircinia ramosa* (Keller, 1889), both well-characterized by Boury-Esnault (1973). We present here the species of Dictyoceratida collected from the continental shelf of Sergipe State, Northeastern Brazil, with description of three species new to science.

Material and methods

Eighteen stations arranged in six transects perpendicular to the coast were sampled by trawling in 2001 to 2003 from the continental shelf of Sergipe State, at the 10, 20 and 30 meter isobaths (Fig. 1). Specimens were fixed in 10% formaldehyde in the laboratory and thereafter preserved in 70% ethanol. Skeletal and isolated fiber sections were made using classical procedures for Dictyoceratida (Hajdu *et al.* 2011), and morphological characters were recorded using light microscopy. The fiber sizes of each specimen were recorded as minimum–mean–maximum width, with $n = 10$. The holotypes are deposited in the Porifera collection of Museu Nacional, Universidade Federal do Rio de Janeiro (MNRJ) and the paratypes are deposited in the Porifera collections of Universidade Federal de Pernambuco (UFPEPOR) and Universidade Federal de Sergipe (UFSPOR). All specimens of *Ircinia strobilina* (Lamarck, 1816) and *Hyattella cavernosa* are deposited in UFSPOR.

The specimens examined show similarity to the other characterizations of *Hyattella cavernosa* from Caribe (van Soest 1978 as *Hyattella intestinalis*) and from Brazil (Boury-Esnault 1973, Muricy *et al.* 2008). The only difference between them was the width of primary fibers. The primary fiber width in Boury-Esnault (1973) is the most similar to the specimens examined here (up to 80 µm wide), while in van Soest (1978) and Muricy *et al.* (2008) the primary fibers are wider (maximum width of 240 µm). Furthermore, the diameter of the meshes in the specimens described by van Soest (1978) and Muricy *et al.* (2008) is also larger compared to the specimens examined here (up to 1000 µm and 750 µm in diameter, respectively). Nevertheless, these differences are considered here as no more than intraspecific variation.

Acknowledgments

We are grateful to the Petrobras and Laboratório de Bentos Costeiro of the Universidade Federal de Sergipe (UFS), especially to Dr. Carmen Regina Parisotto Guimarães for the loan of material and Cosme Assis and Damião Assis for collecting most of the samples. We are also thankful to Dr. Guilherme Muricy for the loan of fragments of the syntypes of *Ircinia pauciareitaria* and for the pictures of the *Ircinia* species collected by Boury-Esnault (1973) as comparison material. We thank to Dr. John Hooper and the anonymous reviewers for helpful comments about the manuscript and MSc. Bia Almeida for technical support. Finally, we thank the Fundação de Amparo a Ciência e Tecnologia do Estado de Pernambuco (FACEPE) and the Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq) for financial support.

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