Zootaxa 3884 (6): 553–560
www.mapress.com/zootaxa/

Article

ISSN 1175-5326 (print edition)
ZOOTAXA
ISSN 1175-5334 (online edition)

http://dx.doi.org/10.11646/zootaxa.3884.6.3
http://zoobank.org/urn:lsid:zoobank.org:pub:9302CD89-CF83-4762-A534-86A50B596832

A new species of *Lophophysema* (Porifera, Hexactinellida, Hyalonematidae) from the South China Sea

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Abstract

We describe *Lophophysema eversa* sp. nov. (Porifera, Hexactinellida, Hyalonematidae) based on a single specimen collected from the South China Sea at a depth of 3683 m. The new species can be distinguished from the three known congeners by its unusual body shape with basalia on the side of the body, the lack of macramphidiscs, the combination of the pinular pentactins having spiny tangential rays and the pinular ray of atrialia longer than dermalia and canalaria. This is the first record of the genus *Lophophysema* from the South China Sea. We also use a partial sequence of the 16S rRNA gene to confirm the family assignment of the new specimen.

Key words: Porifera, Hexactinellida, Hyalonematidae, new species, deep-sea, *Lophophysema*

Introduction

Hyalonematidae Gray, 1857 is a family of Hexactinellida characterized by the presence of amphidiscs and diactins as the major choanosomal megascleres. This family contains five genera, each genus contains no more than 3 species, with the exception of the genus *Hyalonema* Gray, 1832, which contains more than 100 species (Van Soest et al. 2014). The genus *Lophophysema* Schulze, 1900 is characterized by a body composed of two opposite cones and the pinular ray of dermal spicules cylindrical or spindle-like in shape. It contains 3 species, which were reported from Indonesia, western and eastern coasts of Australia, and South Africa (Tabachnick & Levi 1999). In the present study we describe a new species belonging to the genus *Lophophysema* collected by the Chinese manned submersible "Jiaolong" from the South China Sea in June–July 2013.

Material and Methods

Sample collection. A single specimen was collected by the Chinese manned submersible "Jiaolong" from the bathyal muddy bottom near a small seamount northeast of Zhongsha Islands, South China Sea in 2013. The specimen was deposited in the Marine Biological Museum of the Chinese Academy of Sciences (MBM) in the Institute of Oceanology of the Chinese Academy of Sciences, Qingdao, China (IOCAS).

Spicule analysis. Spicules were isolated by digesting a small piece of sponge tissue using concentrated nitric acid at 60°C overnight, and were observed using scanning electron microscopy (SEM) and light microscopy (LM). For SEM the spicules were concentrated onto a cover glass (11 mm × 11 mm) attached to an SEM stub, coated with gold, and observed using a Hitachi S-3400N. For LM observation of the spicules were observed using an Olympus DSX500 Opto-digital microscope, and the spicules were measured using the manufacturer's image analysis software. The measurements are provided in Table 1.

Accepted by J. Hooper: 30 Oct. 2014; published: 19 Nov. 2014

of the partial 16S rRNA sequence of *L. eversa* sp. nov. also supports the assignment of the new species to Hyalonematidae, closer to *Hyalonema* sp. than to other hexactinellids. However, the phylogenetic relationships between *Lophophysema* and the 4 other genera of Hyalonematidae remain unexplored due to absence of comparable sequence data from any but three *Hyalonema* species so far (Dohrmann et al 2008, 2009).

Acknowledgements

We are grateful to Dr. Dorte Janussen of the Forschungsinstitut und Naturmuseum Senckenberg for her helpful comments on the manuscript. And we sincerely express the gratitude to Konstantin Tabachnick of institute of Oceanology of Russian Academy of Sciences for his useful suggestion on the new species. Special thanks are due to the editor, Professor John Hooper, and the reviewers for investing their time and helping to improve the manuscript. This work was supported by funding from the IOCAS (No. 2012IO060105) and the Strategic Priority Research Program of the Chinese Academy of Sciences (No. XDB06010100).

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