GUITARRA SEPIA N. SP. FROM THE SOUTHWESTERN ATLANTIC (DEMOSPONGIAE, POECILOSCLERIDA, GUITARRIDAE). FIRST RECORD OF A *GUITARRA* WITHOUT PLACOCHELAE

CLÉA LERNER*, EDUARDO HAJDU**,***, MÁRCIO REIS CUSTÓDIO***,**** & ROB W.M. VAN SOEST*****

*Museu de Ciências Naturais, Fundação Zoobotânica do Rio Grande do Sul, Rua Dr. Salvador França, 1427, 90690-000, Bairro Jardim Botânico, Porto Alegre, RS, Brazil
**Museu Nacional, Depto. de Invertebrados, Universidade do Brasil, Rio de Janeiro, RJ, Brazil. Fellow of Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq/Brazil)
***Centro de Biologia Marinha, Universidade de São Paulo, São Sebastião, SP, Brazil.
****Departamento de Fisiologia - Instituto de Biociências, Universidade de São Paulo, São Paulo (SP), Brazil
*****Institute for Biodiversity and Ecosystem Dynamics (Zoological Museum), University of Amsterdam, Amsterdam, The Netherlands
E-mail: cblerner@fzb.rs.gov.br, hajdu@acd.ufrj.br, mcust@usp.br, soest@science.uva.nl

ABSTRACT

This work reports on the first record of *Guitarra* Carter, 1874 for the southern/southeastern Brazilian Coast. *Guitarra sepia* n. sp. is described from the coasts of Santa Catarina, São Paulo and Rio de Janeiro states, from depths of 3 - 25 m. The new species is devoid of placochelae. Its status as belonging to Guitarridae was derived from its possession of spiny isochelae comparable to those in *Guitarra* and *Tetrapocillon*, followed by a cladistic analysis where a closer relationship to *Guitarra indica* Dendy, 1916 and *Guitarra fimbriata* Carter, 1874 was obtained. Reorganizing specimens kept for seven days in seawater enriched to 100 μm silica did not produce placochelae derived microscleres.

KEY WORDS

Taxonomy, Porifera, *Guitarra*, Southwestern Atlantic, Brazil.

INTRODUCTION

The Family Guitarridae Dendy, 1924 is characterized by the presence of plachochelae or plachochelae-derived microscleres [(bi)placochelae, coelodiscs or tetrapocila] often together with smooth or spiny isochelae, or sigmoid microscleres. Megascleres are monactinal or diactinal spicules with many intermediate forms. Exotyles can be present.

An ongoing faunistic survey along southern/southeastern Brazil revealed the first known guitarrid devoid of placochelae-derived microscleres, which is fully described below.

MATERIALS AND METHODS

Taxonomy: the specimens were collected in Santa Catarina ("Marine Biological Reserve of Arvoredo"), São Paulo (Ilhabela) and Rio de Janeiro (Rio de Janeiro, Arraial do Cabo and Búzios), between 3 and 25 m depth by scuba diving. The type series from Santa Catarina is deposited in the Porifera Collection of Museu de Ciências Naturais, Fundação Zoobotânica do Rio Grande do Sul, Brazil (MCNPOR). The remaining specimens are deposited in the Porifera Collection of Museu Nacional, UFRJ (MNRJ). Skeletal slides and dissociated spicule mounts were made following MOTHES-DE-MORAES (1985) and HAJDU (1994). The SEM study was made using a Jeol JSM-5200 Scanning Microscope. Measurements of spicules in text refer to minimum-mean-maximum in μm.

Effects of exposure to seawater with enriched silica: sponges were collected in the Alcatrazes Archipelago (off São Sebastião, ca. 24°10' S - 45°45' W), brought to the laboratory and kept in running seawater. Exposure to air was totally avoided during the process. Living sponges were obtained using the glass implant method (CUSTÓDIO *et al.,* 2002). Briefly, coverslip sections (5 x 20 mm) were introduced into the sponges and left in place for 72 h. Implants were removed then and transferred to cell culture dishes (60 mm - NUNC). These were either kept in a culture chamber at 20° C, or in running seawater as a control. In the chamber, sponges were maintained with daily changes of medium using 0.22 μm polycarbonate filtered seawater collected from the area. Exposure to silica rich medium was performed by supplementing the seawater (measured silica concentration 5.76 μM) with sodium hexafluorosilicate (Na_2SiF_6 - AlfaAesar) in order to obtain a 100 μM solution. This solution was then used in daily changes of medium and the cultures were maintained for one week.

Cladistic analysis: The new species described herein has been added to the dataset presented by URIZ & CARBALLO (2001) to check for its best allocation within the family.

Abbreviations used: MCN: Museu de Ciências Naturais, Porto Alegre, Brazil. MCNPOR: MCN, Porifera Collection, Porto Alegre, Brazil. MNRJ: Museu Nacional, Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil. FZB: Fundação Zoobotânica do Rio Grande do Sul, Porto Alegre, Brazil. ZMA: Zoological Museum Amsterdam, University of Amsterdam, Amsterdam, The Netherlands.

SYSTEMATIC DESCRIPTION

Class Demospongiae Sollas, 1885
Order Poecilosclerida Topsent, 1928
Suborder Mycalina Hajdu, van Soest & Hooper, 1994
Family Guitarridae Dendy, 1924

Diagnosis. Mycalina with microscleres including placochelae-derivatives (placochelae, biplacochelae, dischelae and/or tetrapocillas) (*sensu* HAJDU & LERNER, 2002).

Genus *Guitarra* Carter, 1874.

Diagnosis. Guitarridae with placochelae, and palmate acanthoisochelae or bipocilla-like isochelae.

Guitarra sepia n. sp.
(Fig. 1A-E)

Material studied

Holotype: Brazil, Santa Catarina state: MCNPOR 3582, Ilha do Arvoredo (27°17'42" S, 48°21'36" W), 11 m depth, coll. C.B. Lerner, 24/X/1997.

Paratypes: Brazil, Santa Catarina state: Ilha do Arvoredo - MCNPOR 3177, 8.5 m depth, coll. S. Held, 20/IX/1996; MCNPOR 3413, 8 m depth, coll. C.B. Lerner, 27/III/1997; MCNPOR 3571, 8 m depth, coll. C.B. Lerner, 23/X/1997; MCNPOR 3592, 7 m, coll. C.B. Lerner, 25/X/1997; MCNPOR 3898, 7 m depth, coll. C.B. Lerner, 15/X/1998; MCNPOR 3904, 8 m depth, coll. S. Senna, 16/X/1998; MCNPOR 3973, 14 m depth, coll. C.B. Lerner, 22/II/ 1999; MCNPOR 4002, 9 m depth, coll. C.B. Lerner, 27/II/ 1999. Ilha da Galé - MCNPOR 1717, 13 m depth, coll. C.B. Lerner, 03/I/1989; MCNPOR 2220, 7 m depth, coll. C.B. Lerner, 08/II/1991; MCNPOR 2229, 3 m depth, coll. C.B. Lerner, 14/II/1991; MCNPOR 2398, 12 m depth, coll. C.B. Lerner, 13/II/1992, MCNPOR 3346, 11 m deep, coll. E. Hajdu, 14/XII/1996; MCNPOR 3649, 10 m depth, coll. C.B. Lerner, 29/XII/1997. Ilha Deserta - MCNPOR 3193, 10 m depth, coll. S. Held, 21/IX/1996; MCNPOR 3967, 3968, 14 m depth, coll. C.B. Lerner, 21/II/1999. Schyzotypes from Paratypes deposited at ZMA.

Additional material: Brazil, São Paulo state: MNRJ-112, Ilhabela (Saco da Serraria, Ilha de São Sebastião, 23°48.344' S - 45°14.401' W), 13 m, E. Hajdu, 11/I/1996. MNRJ-203, 218, Ilhabela (small embayment between Ponta da Sela and Ponta da Figueira, São Sebastião Channel, 23°53.127' S - 45°27.526' W), 12 m, E. Hajdu, 16/I/1996. MNRJ-527, Ilhabela (Ponta do Frade, Ilha de São Sebastião, south side, 23°54.972' S - 45°27.547' W), 13 - 17 m, E. Hajdu, 21/VI/1997. MNRJ-551, Ilhabela (rock cliff at Ponta do Boi, Ilha de São Sebastião, south side, 23°57.957' S - 45°16.120'W), 20 - 24 m, E. Hajdu, 22/VI/1997. MNRJ-557, Ilhabela (Ponta do Frade, Ilha de São Sebastião, south side, 23°54.972' S - 45°27.547' W), 24 - 25 m, M. LeBlanc, 18/VI/1997. MNRJ-558, Ilhabela (Ponta do Frade, Ilha de São Sebastião, south side, 23°54.972' S - 45°27.547' W), 13 - 17 m, E. Hajdu, 21/VI /1997. MNRJ-5838, São Sebastião (Alcatrazes Archipelago), 10 m, E. Hajdu, 02/V/2002. MNRJ-5840, São Sebastião (Alcatrazes Archipelago), 12 m, U.S. Pinheiro & M. Ventura, 02/V/2002. Brazil, Rio de Janeiro state: MNRJ-3907, Rio de Janeiro (Ilha Cagarra, Cagarras Archipelago), G. Muricy & L. Monteiro, 01/II/2001. MNRJ-3923, Rio de Janeiro (Ilha Comprida, Cagarras Archipelago), G. Muricy & L. Monteiro, 01/II/2001. MNRJ-3997, 4059, Arraial do Cabo (Ponta do Anequim, Ilha do Cabo Frio), 6 - 10 m, E. Hajdu & E. Vilanova, 08/IV/2001. MNRJ-5171, Rio de Janeiro (Ilha de Palmas, Cagarras Archipelago), 17 - 20 m, E. Hajdu, 08/XII/2001.

Diagnosis. *Guitarra* with acanthoisochelae but lacking placochelae derivative.

Description. (based on holotype MCNPOR 3582)

External morphology. (Fig. 1A-C) Massively encrusting sponge. The holotype measures 6 by 11 cm in area and 5 cm in height. Numerous oscules from 1 to 5 mm in diameter are located on top of small elevations. Colour *in situ* black (mostly),

yellow (rarely) or yellow with black spots (often), interior always yellow. Consistency fluffy, extremely delicate and fragile. Surface smooth and transparent.

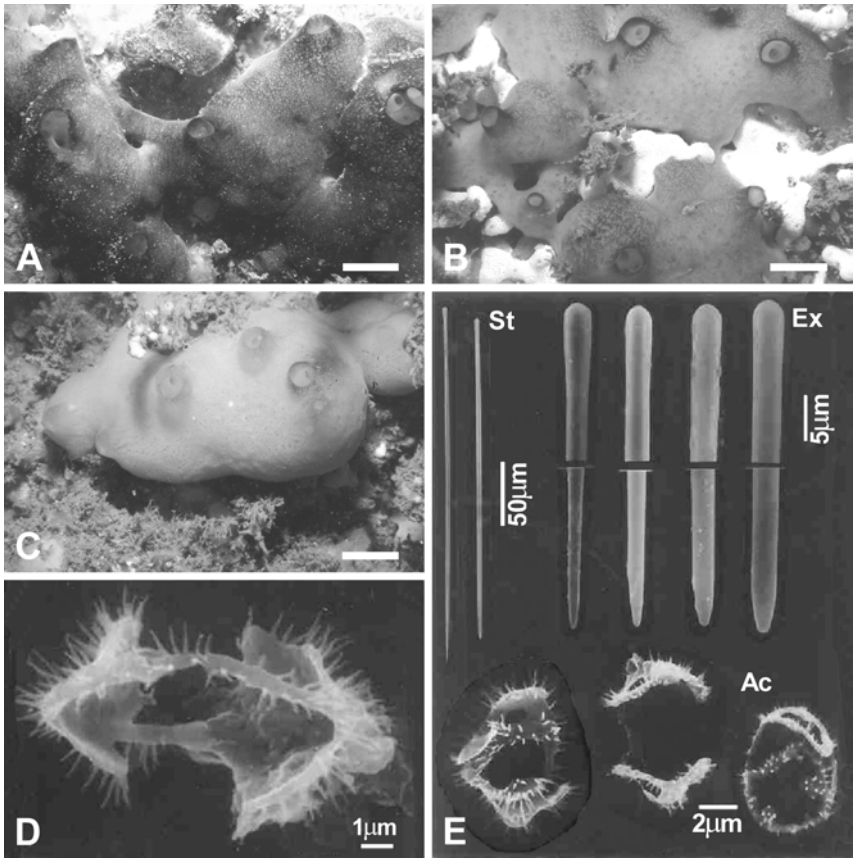

Fig. 1. A-C, Underwater photographs. *Guitarra sepia* n. sp. (paratypes *in situ*). Scale bar 2 cm. **D-E,** SEM photographs. **D,** Detail of acanthoisochelae. **E,** *Guitarra sepia* n. sp. St. (Subtylo)styles. Ex. Extremity of (subtylo)styles. Ac. Acanthoisochelae.

Skeleton. Choanosomal skeleton reduced to a loosely plumose arrangement; ectosomal skeleton absent.

Spicules. (Fig. 1D-E, Tab. I) Megascleres: very slender and straight (subtylo)styles with thick axial canal. Microscleres: spiny isochelae rudimentary, but heavily spined. Spines are long, delicate, irregular, and frequently sinuous. Its shaft is thin, the lateral alae of both extremities malformed, and the frontal alae nearly missing, but almost touching each other.

Etymology. The specific name refers to the frequently black color of the sponge surface.

EXPOSURE TO ENRICHED SILICA MEDIUM

Development of tissues in culture was normal, as verified by the presence of choanocyte chambers, spicule secretion and skeleton organization. No remarkable alterations on spiculogenesis patterns between control and treated cultures were observed during the seven days experimental period.

Tab. I. *Guitarra sepia* n. sp.: spicule micrometries expressed in μm.

	(subtylo)styles	spiny isochelae
MCNPOR 3582	219-234.2-276	5.8-7.4-8.1
Holotype	2.3-3.7-4.6	n=17
MCNPOR 1717	184-219.9-258	6.9-8.1
Paratype	2.3-3.7-6.9	n=4
MCNPOR 2220	184-226.7-251	8.1
Paratype	2.3-3.4-4.6	n=1
MCNPOR 2229	182-220.4-251	6.9-9.2
Paratype	2.3-3.2-4.6	n=4
MCNPOR 2398	200-221.4-247	6.9-8.1
Paratype	2.3-4.3-4.6	n=2
MCNPOR 3177	209-239.1-276	6.9-8.1
Paratype	2.3-4.3-4.6	n=2
MCNPOR 3193	228-258.1-236	5.8-8.1
Paratype	2.3-4.1-4.6	n=2
MCNPOR 3346	200-230.2-257	6.9
Paratype	2.3-4.1-6.9	n=1
MCNPOR 3413	204-242.6-266	6.9
Paratype	2.3-2.6-3.5	n=1
MCNPOR 3571	219-241.3-257	6.9-8.1
Paratype	2.3-3.9-4.6	n=3
MCNPOR 3592	228-247.6-266	6.9-7.1-8.1
Paratype	2.3-3.7-4.6	n=10
MCNPOR 3649	228-237-247	6.9
Paratype	2.3-3.2-4.6	n=1
MCNPOR 3898	223-245.4-271	6.9-9.2
Paratype	2.3-3.7-4.6	n=4
MCNPOR 3904	209-236-266	6.9-8.1-9.2
Paratype	2.3-3.8-4.6	n=14
MCNPOR 3967	185-241.7-266	8.1-9.2
Paratype	2.3-4.3-5.8	n=3
MCNPOR 3968	195-240.9-276	6.9-9.2
Paratype	2.3-3.8-4.6	n=5
MCNPOR 3973	200-234.4-271	5.8-7.1-8.1
Paratype	2.3-3.4-4.6	n=13
MCNPOR 4002	209-251.4-290	6.9-7.2-8.2
Paratype	2.3-3.4-4.6	n=11

CLADISTIC ANALYSIS

Hennig86 was used with the successive weighting protocol. Several alternative coding schemes were employed, mostly due to polymorphic or absent characters, but the new species always ended up within the concept of *Guitarra*.

REMARKS

The absence of plachochelae or plachochelae-derived microscleres hampers an easy and objective assignment to a particular genus within the Guitarridae, as both *Guitarra* and *Tetrapocillon* may have this category of microsclere. Consequently, we employed an experimental protocol through which specimens of the new species were kept in a silica enriched medium, as successfully implemented by MALDONADO *et al.* (1999) for *Crambe crambe*, to verify the possibility that a burst of silica might induce the species to produce the supposedly missing placochelae derivative. Seven days of exposure produced no noticeable alteration to the species' spiculogenesis, and although effects with longer exposure times cannot be ruled out, it seems probable that higher silica concentrations produce no effects on the species' spicule complement.

Based on the outcome of the cladistic analyses performed, and on the shape of the acanthoisochelae, we propose that the new species is closest to *Guitarra fimbriata* and *Guitarra indica*. It differs markedly from both in lacking placochelae, possessing (subtylo)styles as megascleres and having acanthoisochelae with long and delicate spines which are not clustered in clumps. *G. fimbriata* and *G. indica* possess tornostrongyles / oxeas as megascleres and acanthoisochelae with clustered spines.

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