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**New records of the genus *Agelas* Duchassaing & Michelotti, 1864  
(Porifera, Agelasida) off the Amazon River mouth, Brazil, Southwestern Atlantic**

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**Abstract**

Mothes, B., Campos, M., Lerner, C., Carraro, J.L. & Parra-Velandia, F.J. **New records of the genus *Agelas* Duchassaing & Michelotti, 1864 (Porifera, Agelasida) off the Amazon River mouth, Brazil, Southwestern Atlantic.** *Biota Neotrop.* Sep/Dez 2007 vol. 7, no. 3 <http://www.biotaneotropica.org.br/v7n3/pt/abstract?article+bn01007032007>. ISSN 1676-0603.

This work provides new information on agelasid sponges found on the continental shelf off northern Brazil. *Agelas sceptrum* (Lamarck, 1815) and *Agelas wiedenmayeri* Alcolado, 1984 have their first record for the Brazilian coast. *Agelas dispar* Duchassaing & Michelotti, 1864 and *Agelas schmidtii* Wilson, 1902, previously recorded from Brazil, are cited for the first time off the mouth of the Amazon River.

**Keywords:** *Porifera, Agelas, off Amazon River mouth, Brazil, taxonomy.*

**Resumo**

Mothes, B., Campos, M., Lerner, C., Carraro, J.L. & Parra-Velandia, F.J. **Novos registros do gênero *Agelas* Duchassaing & Michelotti, 1864 (Porifera, Agelasida) ao largo da desembocadura do Rio Amazonas, Brasil, Atlântico Sudoeste.** *Biota Neotrop.* Sep/Dez 2007 vol. 7, no. 3 <http://www.biotaneotropica.org.br/v7n3/pt/abstract?article+bn01007032007>. ISSN 1676-0603.

Este trabalho fornece novas informações sobre esponjas agelasidas encontradas na costa norte da plataforma continental brasileira. *Agelas sceptrum* (Lamarck, 1815) e *Agelas wiedenmayeri* Alcolado, 1984 têm seu primeiro registro para a costa brasileira. *Agelas dispar* Duchassaing & Michelotti, 1864 e *Agelas schmidtii* Wilson, 1902, registradas anteriormente na costa brasileira, são citadas pela primeira vez ao largo da desembocadura do Rio Amazonas.

**Palavras-chave:** *Porifera, Agelas, Desembocadura do Rio Amazonas, Brasil, Taxonomia.*

## Introduction

The taxonomy of the genus *Agelas* is difficult to elucidate because of the small number of comparative morphological characters. The presence of only one kind of spicule (acanthostyles; acanthoxeas sometimes present) and wide variability in color and habit characterize a sponge group with possible intra-specific variation.

Members of *Agelas* are typically found in tropical waters, with their highest diversity in the Caribbean Sea, followed by the Indo-Pacific Ocean and the Mediterranean Sea. In the Caribbean they are important components of reef communities. Sponges of this genus have potential economic value due to their pronounced bioactive properties (Assmann et al. 2001). Records of *Agelas* from the Brazilian coast were given by Johnson (1971), Boury-Esnault (1973), Hechtel (1976), Solé-Cava et al. (1981), Collette & Rützler (1977), Muricy & Moraes (1998) and Muricy et al. (2006). Our results provided two new records for the Brazilian coast and new occurrences of *Agelas dispar* Duchassaing & Michelotti, 1864 and *Agelas schmidtii* Wilson, 1902 for the area. With the new records, the southern limits of distribution of *Agelas sceptrum* (Lamarck, 1815), *Agelas schmidtii* Wilson, 1902 and *Agelas wiedenmayeri* Alcolado, 1984 are extended to the southwestern Atlantic. This study contributes to knowledge of the diversity of sponges of one of the least-studied areas off the Brazilian coast.

## Material and Methods

The samples were dredged from depths between 25 and 100 m, off the states of Pará to Maranhão (Figura 1), during several oceanographic expeditions carried out to inventory the biological resources and to characterize the environment [e.g., Diretoria de Hidrografia e Navegação da Marinha do Brasil (DHNM - Comissão Pesca Norte I), Superintendência de Desenvolvimento do Nordeste (SUDENE - Comissão Maranhão), and Programa de Avaliação do Potencial de Recursos Vivos da Zona Econômica Exclusiva (REVIZEE - Score Norte II, III and IV)].

Spicule mounts and thick sections were made according to methods of Mothes-De-Moraes (1978) and Mothes et al. (2004a), respectively. Preparations for Scanning Electron Microscopy (SEM) study followed the procedures described in Silva & Mothes (1996). Spicule measurements comprised minimum, mean, and maximum sizes in micrometers ( $\mu\text{m}$ ), from  $n = 50$  spicules except when indicated. When  $N < 20$  only the minimum and maximum are indicated. The microspines were included in the spicule width measurements. Measurements of fibres and meshes are of the diameter. The samples were preserved in 96° ethyl alcohol and deposited in the collection of the Museu de Ciências Naturais - Porifera Collection, Fundação Zoobotânica do Rio Grande do Sul, Porto Alegre, RS, Brazil (MCNPOR).

Abbreviations used: ZMA, Zoologisch Museum Amsterdam, Amsterdam, Netherlands; INVEMAR, Instituto de Investigaciones Marinas y Costeras, Santa Marta, Colombia; INV-POR, Porifera collection, Instituto de Investigaciones Marinas de Punta Betín, Colombia; IdO, Instituto de Oceanología de la Academia de Ciencias de Cuba, La Habana, Cuba; MCNPOR, Porifera collection, Museu de Ciências Naturais da Fundação Zoobotânica do Rio Grande do Sul, Brazil.

## Characterization of the study area

The study area is located off the northern coast of Brazil, comprising a geographical area from the Oiapoque River, state of Amapá, to the Parnaíba River, state of Piauí (sampling was concentrated off the Amazon River mouth, from Pará to Maranhão State). In

this region the continental shelf is wide, especially near the Amazon River where it extends up to 150 miles, with a slight slope at the north and an abrupt slope at the northeast (Coutinho & Moraes 1970). The ocean current system in the Amazon Gulf is complex (Mothes et al. 2004b). The region lies in the equatorial zone, with warm surface waters ( $\sim 27^\circ\text{C}$ ) and salinities of 36-38‰ (Ottman 1959, Vannucci 1964). The surface sediments of the continental margin from Cabo Orange to the Parnaíba Delta are composed of terrestrial sediments on the inner and middle shelf, which change to biotrititic sediment toward the shelf break (Martins & Coutinho 1981).

The continental shelf off the state of Maranhão has a sandy bottom, which increases at northwest from the mouth of the Parnaíba River, with the highest content off Pará. Only the sandy and biotrititic facies are quantitatively important; the presence of mud is limited to isolated spots, due to the influence of the coastal rivers. Organogenic bottoms cover an extensive area of the Brazilian continental shelf between the states of Pará and Rio de Janeiro, with a calcareous-algae facies which is mainly comprised of living algae, which form isolated reefs of various sizes. At the northern limit of the shelf, living calcareous algae are dominant, with large numbers and many forms, mainly encrusting algae (Luna 1979). The abundant presence of hard substratum off the mouth of the Amazon River was also corroborated by Collette & Rützler (1977).

## Results

### Agelasidae

#### 1. *Agelas sceptrum* (Lamarck, 1815)

(Figures 2-4)

*Alcyonium sceptrum* Lamarck, 1815:163 (type locality: unknown).

*Agelas sceptrum*; Van Soest & Stentoft 1988:100; Lehnert 1993:50, figs. 23,87-88; Lehnert & Van Soest 1998:81; Lehnert & Van Soest 1999:155.

**Further synonymy:** see Zea (1987).

**Material examined:** BRAZIL, Maranhão:  $00^\circ 51' 44''$  S and  $44^\circ 21' 24''$  W, 100 m, unregistered substratum, coll R/V "Almirante Saldanha", 13.XI.1997, REVIZEE - II (MCNPOR 3842);  $00^\circ 22' 00''$  N and  $44^\circ 52' 00''$  W, 72 m, unregistered substratum, coll R/V "Almirante Saldanha", 18.VII.2001, REVIZEE - IV (MCNPOR 5347).

**Description:** (Figure 2) Rамose sponge. Surface irregular with meandering invaginations, hispid to the touch. Round oscules slightly aligned (the greater oscule observed has 0.3 cm), some obstructed by a fine translucent membrane. Pores not observed. Preserved material

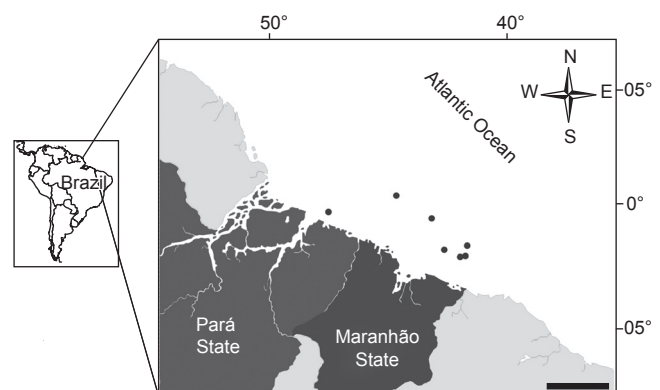
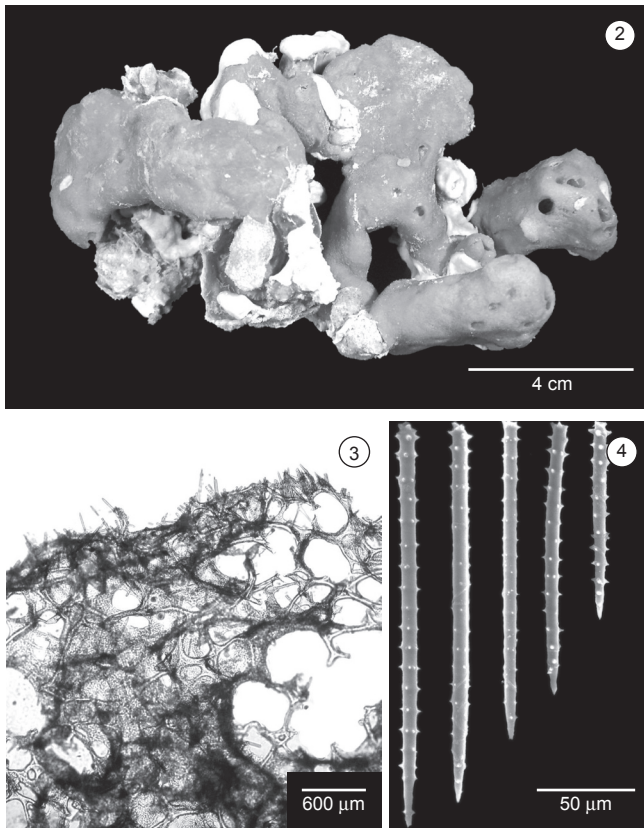


Figure 1. Map showing the collecting area.

Figura 1. Mapa indicando área de coleta.



**Figures 2-4.** *Agelas sceptrum* (Lamarck, 1815). 2. MCNPOR 5347. 3. Skeletal architecture in perpendicular section. 4. Acanthostyles.

**Figuras 2-4.** *Agelas sceptrum* (Lamarck, 1815). 2. MCNPOR 5347. 3. Seção perpendicular da arquitetura esquelética. Acanthóstilos.

very elastic, extremely difficult to cut; coloration brown. Dimensions of the largest specimen (MCNPOR 5347), in cm: 33 length, 2.0 width and 1.0 diameter.

**Skeleton:** (Figure 3) Ectosome consisting of a fine, very characteristic layer of the genus, made by brushes of spicules, which protrudes in the surface. Choanosome with primary ascending echinated fibres, multispiculary cored by 08-12 spicules per cross section, interconnected by secondary fibres, uncored or rarely cored by one spicule; the fibre system usually present rounded or polygonal meshes.

**Spicules:** (Figure 4) Acanthostyles slightly curved or sometimes straight; Acanthoxeas rare. Dimensions in Table 1.

**Remarks:** The specific identification was based on slides of *Agelas sceptrum* (Lamarck, 1815), collected on Pear Tree Bottom, Discovery Bay, Jamaica (INV-POR 1005). Spicules of the studied material are very similar to the Caribbean samples. In regard to the mesh sizes, the examined specimens shown a smaller size than the registered for Caribbean material (Lehnert & Van Soest 1999). This difference can be related to the contracted fibres in fixed specimens.

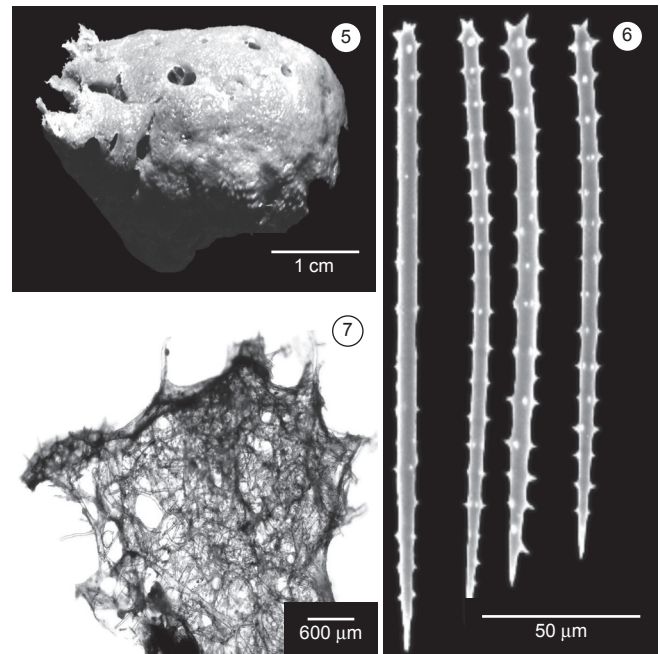
**Geographic distribution:** Tropical Western Atlantic: from the Archipelago of the Bahamas to Colombia (Zea 1987); Brazil: Maranhão (first record).

**Bathymetric distribution:** From 12 m, Isla Tesoro, Colombia (Zea 1987) to 150 m, Barbados (Lewis 1965).

## 2. *Agelas dispar* Duchassaing & Michelotti, 1864

(Figures 5-7)

*Agelas dispar* Duchassaing & Michelotti, 1864:76 (type locality: St. Martin, Caribbean); Boury-Esnault 1973:285, fig. 45, pl. 1,



**Figures 5-7.** *Agelas dispar* Duchassaing & Michelotti, 1864. 5. MCNPOR 1872. 6. Skeletal architecture in perpendicular section. 7. Acanthostyles.

**Figuras 5-7.** *Agelas dispar* Duchassaing & Michelotti, 1864. 5. MCNPOR 1872. 6. Seção perpendicular da arquitetura esquelética. 7. Acanthóstilos.

fig. 8; Solé-Cava et al. 1981:131 fig. 7; Zea 1987:207, fig.75, pl. 12, fig. 8; Lehnert 1993:50, figs. 22, 79, 80-82; Muricy & Moraes 1998: 215; Lehnert & Van Soest 1998:81; Lehnert & Van Soest 1999:154; Muricy et al. 2006:116

**Further synonymy:** see Wiedenmayer (1977) and Zea (1987).

**Material examined:** BRAZIL **Pará:** 00° 26' 00" S - 47° 35' 05" W, 24-25 m, sandy substratum, coll. R/V "Almirante Saldanha", 21.XI.1968, Comissão Pesca Norte I, (MCNPOR 1872); **Maranhão:** 01° 55' 00" S and 42° 44' 00" W, 63 m, biotrititic substratum, coll. Fishing boat "IV SUDENE", 18.II.1973, Comissão Maranhão, (MCNPOR 1848).

**Description:** (Figure 5) Round-shaped fragment. Surface micro-nucleose, smooth to the touch. Oscules round irregularly distributed on the surface (the largest oscule observed 0.3 cm), some covered by pinacoderm. Pores not observed. Preserved material compressible difficult to cut; coloration brown. Dimensions of the largest specimen (MCNPOR 1872), in cm: length 4.0, width 2.0 and diameter 1.0.

**Skeleton:** (Figure 6) Ectosome consisting of fine dermic membrane supported by brushes of spicules disposed in primary fibres. Choanosome with ascending echinated primary fibres cored by 01-05 spicules per cross section; secondary fibres commonly uncored, interconnecting primary fibres and forming rectangular or rounded meshes.

**Spicules:** (Figure 7) Acanthostyles straight or slightly curved. Dimensions in Table 2.

**Remarks:** The studied specimens were identified based on a comparative analysis with the schizoholotype's slides of *Agelas dispar* Duchassaing & Michelotti, 1864 (MCNPOR 2635) (Holotype ZMAPOR 607, Saint Martin) and material collected in Carrie Bow Cay, Belize (INV-POR 953). Spicules of the schizoholotype are similar to those of the studied material while those of Belize are much more robust. In the studied material acanthoxeas have not been observed. The occurrence of such spicules in *Agelas* seems to be rare. Spicules more robust had been recorded by Solé-Cava et al. (1981) in specimens collected more to the south in the Brazilian coast, in the infralittoral of Guarapari, Espírito Santo.

**Table 1.** *Agelas sceptrum* (Lamarck, 1815): dimensions. n = 50 when not indicated.**Tabela 1.** *Agelas sceptrum* (Lamarck, 1815): dimensões. n = 50 quando não indicado.

	Acanthostyles	Acanthoxeas	Fibres
<b>MCN</b>	98.9- <b>170</b> -223.1 / 6.9- <b>9.7</b> -11.5 µm*	(n = 03)	primaries 31.3-60 µm
<b>POR</b>	10-16 whorls	276 / 10.3 µm	secondaries 10-25 µm
<b>3842</b>	4-6 spines per whorl distance between the whorls 5.0- <b>8.1</b> -10 µm	26 whorls 4-8 spines per whorl distance between the whorls 6.9-11.5 µm	meshes 100-340 µm
<b>MCN</b>	87- <b>180.9</b> -225 / 7.5- <b>13</b> -17.5 µm	(n = 14)	primaries 25-52.5 µm
<b>POR</b>	10-19 whorls	115-210 / 7.5-15 µm	secondaries 22.5-50 µm
<b>5347</b>	4-8 spines per whorl distance between the whorls 5.0- <b>9.0</b> -12.5 µm	13-19 whorls 4-8 spines per whorl distance between the whorls 7.5-10 µm	meshes 70-430 µm
<b>INV</b>	80- <b>140</b> -199 / 5.1- <b>8.8</b> -11.6 µm	absent	primaries 60-100 µm
<b>POR</b>	9-22 whorls		secondaries 50-80 µm
<b>1005</b>	6-8 spines per whorl distance between the whorls 8.5- <b>9.8</b> -10.4 µm		meshes 100-390 µm

\*min, **mean**, max length/min, **mean**, max width.\*min, **média**, max comprimento/min, **média**, max largura.**Table 2.** *Agelas dispar* Duchassaing & Michelotti, 1864: dimensions. n = 50 when not indicated.**Tabela 2.** *Agelas dispar* Duchassaing & Michelotti, 1864: dimensões. n = 50 quando não indicado.

	Acanthostyles	Acanthoxeas	Fibres
<b>MCN</b>	64.4- <b>166</b> -214 / 5.0- <b>7.0</b> -9.0 µm*	absent	primaries 28.5-100 µm
<b>POR</b>	11-16 whorls		secondaries 19-76 µm
<b>1872</b>	6-8 spines per whorl distance between the whorls 7.5- <b>10</b> -15 µm		meshes 70-360 µm
<b>MCN</b>	65- <b>140</b> -215 / 5.0- <b>9.2</b> -12.5 µm	absent	primaries 37.3-77.5 µm
<b>POR</b>	6-16 whorls		secondaries 15-30 µm
<b>1848</b>	4-8 spines per whorl distance between the whorls 7.5- <b>8.1</b> -10 µm		meshes 110-430 µm
<b>INV</b>	111- <b>134</b> -174 / 6.4- <b>10.2</b> -12.3 µm	absent	primaries 50-100 µm
<b>POR 953</b>	10-16 whorls 6-8 spines per whorl distance between the whorls 7.8- <b>9.9</b> -11.1 µm		secondaries 40-60 µm meshes 80-330 µm
<b>MCN</b>	71.3- <b>92.3</b> -112.7 / 2.3- <b>4.1</b> -5.8 µm	(n = 02)	primaries 47.5-161.5 µm
<b>POR</b>	6-11 whorls	92-99 / 4.6-10.4 µm	secondaries 19-61.8 µm
<b>2635</b>	4-6 spines per whorl distance between the whorls 6.9- <b>9.5</b> -12.7 µm	9 whorls; 4 spines per whorl distance between the whorls; 6.9-9.5 µm	meshes 104.5-332.5 µm

\*min, **mean**, max length/min, **mean**, max width.\*min, **média**, max comprimento/min, **média**, max largura.

**Geographic distribution:** Tropical Western Atlantic: From Bahamas to Colombia (Wiedenmayer 1977, Zea 1987). Brazil: Pará and Maranhão (first records); Fernando de Noronha; Pernambuco and Bahia (Boury-Esnault 1973); Espírito Santo (Solé-Cava et al. 1981, Muricy et al. 2006); Rio de Janeiro, Brazil (Muricy et al. 2006).

**Bathymetric distribution:** From 1 m, Rosário Islands, Colombia (Zea 1987) to 270 m, Rio de Janeiro, Brazil (Muricy et al. 2006).

### 3. *Agelas schmidti* Wilson, 1902

(Figures 8-10)

*Agelas schmidti* Wilson, 1902:398 (type locality: Virgin Islands, Caribbean); Zea, 1987:210, fig. 9, 76; Van Soest & Stentoft 1988:102,

fig. 50; Lehnert & Van Soest 1998:81; Lehnert & Van Soest 1999:156; Muricy et al. 2006:116 [non *A. schmidti* Wiedenmayer, 1977 = *A. wiedenmayeri* Alcolado, 1984].

**Material examined:** BRAZIL, Maranhão: 02° 14.21' 49" S and 42° 00.12' 20" W, 72 m, unregistered substratum, 06.XII.1997 REVIZEE - II (MCNPOR 3789); 02° 12' 00" S - 41° 48' 00" W, 56 m, biotretic substratum, coll. Fishing boat "IV SUDENE", 15. II.1973 Comissão Maranhão, (MCNPOR 1833).

**Description:** (Figure 8) Sponge massive-lobate, irregular, apparently repent. Surface slightly microconulose, smooth to the touch. Oscules randomly distributed all over the surface, some of them

linearly positioned and/or forming areas with more concentration (largest oscule observed 0.4 cm), rarely obstructed by the pinacoderm. Pores not observed. Preserved material compressible, elastic, difficult to cut; variable coloration: rose, dark-yellow or purple. Dimensions of a branch of the largest specimen (MCNPOR 3789), in cm: length 10.5, width 3.0 and diameter 1.6.

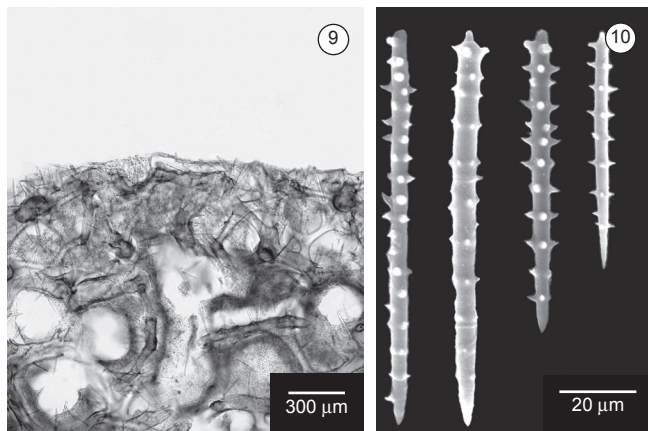
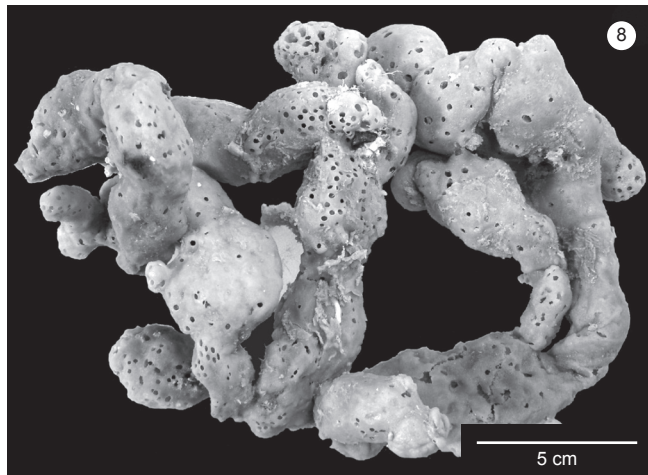
**Skeleton:** (Figure 9) Ectosome similar to the previous species, formed by an organic dermis supported by brushes of choanosomal primary fibres with approximately 11 spicules. Choanosome with primary fibres cored by several spicules, connected by uncored secondary fibres or with a great number of echinating spicules in the inner portion of the rounded or polygonal meshes.

**Spicules:** (Figure 10) Acanthostyles: straight, some slightly curved; acanthoxeas rare. Dimensions in Table 3.

**Remarks:** The identification of the studied material is based on the slides of *Agelas schmidtii* Wilson, 1902, from Santa Marta, Colombia (INV-POR 989). Acanthostyles of Caribbean specimens are slightly larger (Zea 1987; Van Soest & Stentoft 1988). However, the number of verticilles and thorns are similar to those of the studied material.

**Geographic distribution:** Tropical Western Atlantic: from Virgin Islands to Barbados (Van Soest & Stentoft 1988). Brazil: Maranhão (first record); Espírito Santo and Rio de Janeiro, Brazil (Muricy et al. 2006).

**Bathymetric distribution.** From 6 m, Cartagena, Colombia (Zea 1987) to 153 m, Paynes Bay, Barbados (Van Soest & Stentoft 1988).



**Figures 8-10.** *Agelas schmidtii* Wilson, 1902. 8. MCNPOR 3789. 9. Skeletal architecture in perpendicular section. 10. Acanthostyles.

**Figuras 8-10.** *Agelas schmidtii* Wilson, 1902. 8. MCNPOR 3789. 9. Seção perpendicular da arquitetura esquelética. 10. Acanthóstilos.

#### 4. *Agelas wiedenmayeri* Alcolado, 1984

(Figures 11-13)

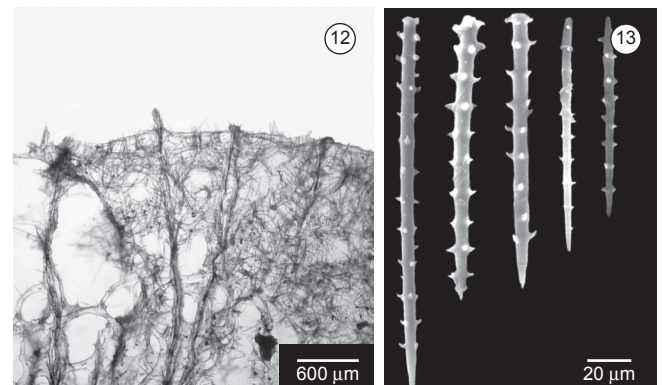
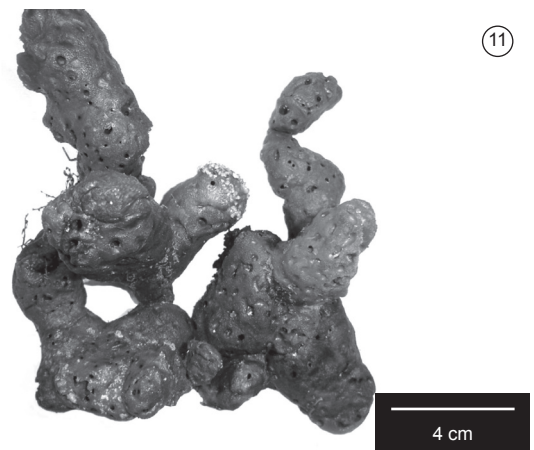
*Agelas wiedenmayeri* Alcolado, 1984:11, figs 7-B-C, 8B (type locality: Barlovento, Havana, Cuba).

*Agelas schmidtii*; Wiedenmayer 1977:129, fig. 137, lam. 27, fig. 1. non *Agelas schmidtii* Wilson, 1902 (a valid species)

**Material examined:** BRAZIL, Maranhão: 01° 34' 36" S and 3° 15' 57" W, 60 m, unregistered substratum, 17.VI.1999 REVIZEE III (MCNPOR 4808); 00° 35' 12" S - 43° 20' 55" W, 94 m, unregistered substratum, 14.VI.1999 REVIZEE III (MCNPOR 4978).

**Description:** (Figure 11) Sponge ramosely slightly conical at the apex. Dimensions of the largest specimen (MCNPOR 4978), length 53; width 3.0 and diameter 2.5 cm. Surface irregular, smooth to the touch. Circular openings, oscules or pores (diameter: 0.2-0.4 cm) randomly distributed on the surface; rarely in a linear pattern, some of them obstructed by the pinacoderm. Preserved material very compressible, however difficult to cut; external coloration dark purple, with some brown areas.

**Skeleton:** (Figure 12) Ectosome as a thin layer, without specialization, supported by spicule brushes which protrude from the choanosome. Choanosome formed by multispicular primary fibres, up to 8 spicules per section cross, some spicules in echinating arrangement. At the surface, spicules protrude in brushes; primary fibres connected by secondary fibres, cored by few spicules, in general bearing echinating spicules, forming rounded or polygonal meshes. Echinating spicules of secondary fibres, near to the sponge surface,



**Figures 11-13.** *Agelas wiedenmayeri* Alcolado, 1984. 11. MCNPOR 4978. 12. Skeletal architecture in perpendicular section. 13. Acanthostyles.

**Figuras 11-13.** *Agelas wiedenmayeri* Alcolado, 1984. 11. MCNPOR 4978. 12. Seção perpendicular da arquitetura esquelética. 13. Acanthóstilos.

**Table 3.** *Agelas schmidti* Wilson, 1902: dimensions. n = 50 when not indicated.**Tabela 3.** *Agelas schmidti* Wilson, 1902: dimensões. n = 50 quando não indicado.

	Acanthostyles	Acanthoxeas	Fibres
MCN POR 1833	74- <b>140</b> -184 / 3.0- <b>6.0</b> -7.0 µm* 9-15 whorls 4-6 spines per whorl distance between the whorls 7.5- <b>8.3</b> -10 µm	absent	primaries 28 - 70 µm secondaries 20-50 µm meshes 40-440 µm
MCN POR 3789	55- <b>92.4</b> -150 / 2.5- <b>6.2</b> -10 µm 5-16 whorls 4-6 spines per whorl distance between the whorls 5.0- <b>7.2</b> -10 µm	(n = 04) 50-125 / 5-10 µm 3-12 whorls 4-6 spines per whorl distance between the whorls 0-10 µm	primaries 35 - 90 µm secondaries 17.5-30 µm meshes 125-560 µm
INV POR 989	74- <b>126</b> -283 / 5.2- <b>8.0</b> -12.2 µm 5-14 whorls 3-6 spines per whorl distance between the whorls 8.5- <b>9.7</b> -10.3 µm	(n = 1) 60-190 / 6.0-10 µm 6-9 whorls 3-6 spines per whorl distance between the whorls 9-12 µm	primaries 40-90 µm secondaries 10-40 µm meshes 30-500 µm

\* min, **mean**, max length/min, **mean**, max width.

\*min,**média**,max comprimento/min, **média**, max largura.

also protrude in small brushes with 2-3 spicules; some regions bear isolated protruding spicules, regularly organized, with the appearance of a discrete palisade.

**Spicules:** (Figure 13) Acanthostyles: straight or slightly curved to bent; acanthoxeas rare. Dimensions in Table 4.

**Remarks:** Identification of the studied material was based on the material of *Agelas wiedenmayeri* Alcolado, 1984 (Holotype IdO-409, schizoholotype deposited in MCNPOR 7375), and on INV-POR 978, San Andres Island, Colombia. Caribbean specimens have thicker spicules and more thorns per verticil.

**Geographic distribution:** Tropical western Atlantic: Bahamas (Wiedenmayer 1977); Cuba (Alcolado 1984); Belize; San Andres Islands, Rosario Islands and Santa Marta (Colombia) (F.J. Parra unpublished data); Brazil: Maranhão (new record).

**Bathymetric distribution:** From 13 m, Barlovento, Cuba (Alcolado 1984) to 94 m, Maranhão, Brazil (new record).

## General Remarks

The spicule widths in the material studied are smaller than in Caribbean species. This difference may be influenced by dissolved silica in the environment. As Jones (1979) noted, silica availability is one of the factors that affects the growth of spicules. The Brazilian species were collected off the coast, where the amounts of silica tend to be smaller, which would result in narrower spicules. Zea (1987) also observed small spicules in samples collected off Colombian islands, in contrast to those present in closed areas influenced by discharges of the great rivers on the continental coast of Colombia and Central America. At these locations we find larger spicules, because in these areas the dissolved silica content is higher. Similarly, wider spicules of *A. dispar* were reported by Solé-Cava et al. (1981), working with material collected at Guaraparí, state of Espírito Santo, southeastern Brazilian coast (128-**167**-188 / 8.5-**11.3**-18.1 µm); these wider spicules probably resulted from the higher silica quantities.

Substrata and depth range, where the species were collected, are also more diverse compared to observations for Caribbean specimens. In the Caribbean, most species of *Agelas* occur in coral reefs and in shallow waters, up to 50 m (Wiendenmayer 1977;

Alcolado 1984; Zea 1987; Lehnert & Van Soest 1998, 1999), except for *A. schmidti*, which is common in deeper waters, around 100-153 m (Van Soest & Stentoft 1988). Off the Brazilian coast there are records from 50 m down to 270 m, such as for *A. dispar* and *A. conifera* (Schmidt, 1870) (Table 5). In the Caribbean the environment is characterized by coral reefs, where sponges occur up to edge of the reef slope (Zea 1987). In the deeper waters off the Brazilian coast, there is a bioclastic granule bottom composed of calcareous algae, which creates free spaces for the sponges to attach. This kind of bottom occurs over the middle and outer shelf off Brazil, most commonly deeper than 50 m (Diaz 2000). The richness of species of *Agelas* in the northern and central region is practically the same (Table 5), except for Caribbean species such as *A. wiedenmayeri* and *A. sceptrum*, which until recently were not recorded for the Brazilian central region (Muricy et al. 2006). *Agelas conifera* and *A. tubulata* Lehnert & Van Soest, 1996 (have not yet been recorded off the north Brazilian coast (Collette & Rützler 1997; present study).

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**Table 4.** *Agelas wiedenmayeri* Alcolado, 1984: dimensions. n = 50 when not indicated.**Tabela 4.** *Agelas wiedenmayeri* Alcolado, 1984: dimensões. n = 50 quando não indicado.

	Acanthostyles	Acanthoxeas	Fibres
<b>MCN</b>	48.3- <b>95.6</b> -149.5 / 5.0- <b>8.0</b> -10 µm*	(n = 5)	
<b>POR</b>	6-14 whorls	73.6-149.5 / 4.6-9.2 µm	primaries 45-85 µm
<b>4808</b>	4-6 spines per whorl	11-13 whorls	secondaries 12.5-35 µm
	distance between the whorl	4-6 spines per whorl	meshes 80-370 µm
	5.0- <b>6.3</b> -12.5 µm	distance between the whorls	
		5.0-10 µm.	
<b>MCN</b>	52.5- <b>114.4</b> -192.5 / 5.0- <b>10.6</b> -12.5 µm		
<b>POR</b>	7-16 whorls	absent	primaries 50-110 µm
<b>4978</b>	4-6 spines per whorl		secondaries 23.8-40 µm
	distance between the whorls		meshes 90-400 µm
	5.0- <b>7.8</b> -10 µm		
	72.5- <b>130.7</b> -191.4 / 4.7- <b>9.1</b> -15 µm		
<b>INV</b>	10-21 whorls		primaries 60-105 µm
<b>POR</b>	5-7 spines per whorl	absent	secondaries 40-80 µm
<b>978</b>	distance between the whorls		meshes 30-300 µm
	7.9- <b>8.9</b> -9.6 µm		
<b>MCN</b>	94.3- <b>117.1</b> -154.1 / 6.9- <b>8.0</b> -9.2 µm		
<b>POR</b>	9-16 whorls	absent	primaries 47.5-95 µm
<b>7375</b>	4-6 spines per whorl		secondaries 19-57 µm
	distance between the whorls		meshes 104.5-541.5 µm
	6.9- <b>9.3</b> -11.3 µm		

\*min, **mean**, max length/min, **mean**, max width.\*min, **média**, max comprimento/min, **média**, max largura.**Table 5.** Geographic and bathymetric distribution of *Agelas* in the Brazilian coast.**Tabela 5.** Distribuição geográfica e batimétrica de *Agelas* na costa brasileira.

Species	North Coast	Northeast Coast	Central Coast
	Amapá to Piauí	Piauí to Bahia	Bahia to Rio de Janeiro
<i>Agelas dispar</i>	Present study 24-63 m	Boury-Esnault, 1973 27-75 m Muricy & Moraes, 1998 1-30 m	Boury-Esnault, 1973 49-50 m Solé-Cava, 1981 3-12 m Muricy et al. 2006 60-270 m
<i>Agelas schmidti</i>	Present study 56-72 m		Muricy et al. 2006 20-108 m
<i>Agelas sceptrum</i>	Present study 72-100 m		
<i>Agelas wiedenmayeri</i>	Present study 60-94 m		
<i>Agelas tubulata</i>			Muricy et al. 2006 25-89 m
<i>Agelas conifera</i>			Muricy et al 2006 50-270 m
<i>Agelas clathrodes</i>	Collette & Rützler, 1977 60-62 m	Hechtel, 1976 (as <i>A. sparsus</i> ) 27-64 m Muricy & Moraes, 1998 1-30 m	Hechtel, 1976 (as <i>A. sparsus</i> ) 64 m Muricy et al. 2006 50-110 m
<i>Agelas</i> sp.		Johnson, 1971 depth unknown	

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