Antarctic sponges (Porifera, Demospongiae) of the South Shetland Islands and vicinity. Part I. Spirophorida, Astrophorida, Hadromerida, Halichondrida and Haplosclerida [1]

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ABSTRACT. The aim of this work is to redescribe 11 species of sponges collected through the Brazilian Antarctic Program (PROANTAR), at the South Shetland Islands and vicinity. New information is provided on the Antarctic sponge fauna, in regard to species richness and the geographical and bathymetric distributions of identified species. The following species were identified and are here illustrated and fully described: *Cinachyra antarctica* (Carter, 1872), *Cinachyra barbata* Sollas, 1886, *Craniella leptoderma* (Sollas, 1886), *Tethyopsis longispinum* (Lendenfeld, 1907), *Polymastia invaginata* Kirkpatrick, 1907, *Homaxinella balfourensis* (Ridley & Dendy, 1886), *Suberites montiniger* Carter, 1880, *Halichondria (Eumastia) attenuata* (Topsent, 1915), *Haliclona (Soestella) chilensis* (Thiele, 1905), *Hemigellius bidens* (Topsent, 1901) and *Calyx arcuarius* (Topsent, 1913). Two new records are given for the Antarctic continent: *Halichondria (Eumastia) attenuata* (Topsent, 1915) and *Haliclona (Soestella) chilensis* (Thiele, 1905). *Tethyopsis longispinum* (Lendenfeld, 1907), *Suberites montiniger* Carter, 1880 and *Hemigellius bidens* (Topsent, 1901) represent the first records for this sector of the continent. Bathymetric data are extended for *T. longispinum* and *H. attenuata*.
KEY WORDS. Antarctica; PROANTAR; taxonomy.

RESUMO. **Esponjas Antárticas (Porifera, Demospongiae) das Ilhas Shetland do Sul e áreas próximas. Parte I. Spirophorida, Astrophorida, Hadromerida, Halichondrida e Haplosclerida.** O objetivo deste trabalho é redescrever 11 espécies de esponjas coletadas através do Programa Antártico Brasileiro (PROANTAR), nas Is. Shetland do Sul e áreas próximas. Nnovas informações são fornecidas acerca do conhecimento da fauna de poríferos da Antártica, tanto para a riqueza específica como para os dados referentes às distribuições geográfica e batimétrica das espécies identificadas. As seguintes espécies foram identificadas e são aqui ilustradas e amplamente descritas: *Cinachyra antarctica* (Carter, 1872), *Cinachyra barbata* Sollas, 1886, *Craniella leptoderma* (Sollas, 1886), *Tethyopsis longispinum* (Lendenfeld, 1907), *Polymastia invaginata* Kirkpatrick, 1907, *Homaxinella balfourensis* (Ridley & Dendy, 1886), *Suberites montiniger* Carter, 1880, *Halichondria (Eumastia) attenuata* (Topsent, 1915), *Haliclona (Soestella) chilensis* (Thiele, 1905), *Hemigellius bidens* (Topsent, 1901) and *Calyx arcuarius* (Topsent, 1913). Duas espécies são pela primeira vez registradas para o continente antártico, *Halichondria (Eumastia) attenuata* (Topsent, 1915) e *Haliclona (Soestella) chilensis* (Thiele, 1905), enquanto que *Tethyopsis longispinum* (Lendenfeld, 1907), *S. montiniger* Carter, 1880 e *Hemigellius bidens* (Topsent, 1901) apresentam o primeiro registro para este setor do continente. Ampliam-se ainda os dados batimétricos para *T. longispinum* e *H. attenuata*.
PALAVRAS-CHAVE. Antártica; PROANTAR; taxonomia.

Sponges comprise an important element of the Antarctic biota, because of their significant species diversity and the presence of communities predominantly consisting of sponges in some areas of the continent. Sponges are one of the most characteristic groups of this benthic fauna, together with Bryozoa and Echinodermata; this part of the world is probably the only region where the sponges can be found in constant abundance over a large area (Koltun 1969). Literature records indicate a total of 352 species of Antarctic demosponges (McClintock *et al*. 2005). In depths around 100 m, sponges can reach biomass values comparable to the highest levels observed in tropical areas (Sarà *et al*. 1992).

According to Calcinai & Pansini (2000), Antarctic sponges are relatively well known; however, the continent is so extensive that any new study, even in small areas, will add significantly to present knowledge of this group. Although many scientific expeditions have been conducted since the 19th century, there are still some areas where the sponge fauna is little known, such as the South Shetland Islands and vicinity (Ríos *et al*. 2004). In this region, 86 species from 51 genera had been recorded (extrapolated from data of Sarà *et al*. 1992).

The aim of the present study was to provide a full description of the Porifera collected in the ocean area explored by the Brazilian Antarctic Program, at the South Shetland Islands (Elephant I., King George I. and Livingston I) and Bransfield Strait.

MATERIAL AND METHODS

The samples were collected through the Brazilian Antarctic Program, at the South Shetland Islands and in the Bransfield Strait (61°02'-63°44'S/54°16'-62°31'W) (Fig. 1). Situated north of the Antarctic Peninsula, this island group consists of an archipelago formed by King George, Elephant and Livingston islands, together with other, smaller islands. Sampling was carried out on board the R/V "Professor Besnard," between 20 to 412 m depth, by beam-trawl, otter-trawl, SCUBA diving and other, unspecified collection methods.

Taxonomic study was based on the spicules, by dissociated spicule mounts and thick sections of the skeleton, following Mothes-de-Moraes (1978) and Mothes *et al*. (2004), respectively. Preparations for SEM study followed Silva & Mothes (1996). Spicule measurements are presented as minimum, *mean*, and maximum lenght, width after the slash (/), N = 50. The specimens were preserved in 96° GL alcohol and deposited in the Porifera Collection of Museu de Ciências Naturais, Fundação Zoobotânica do Rio Grande do Sul, Porto Alegre, RS, Brazil (MCNPOR).

Other abbreviation used in the text is BMNH (The Natural History Museum, London, England).

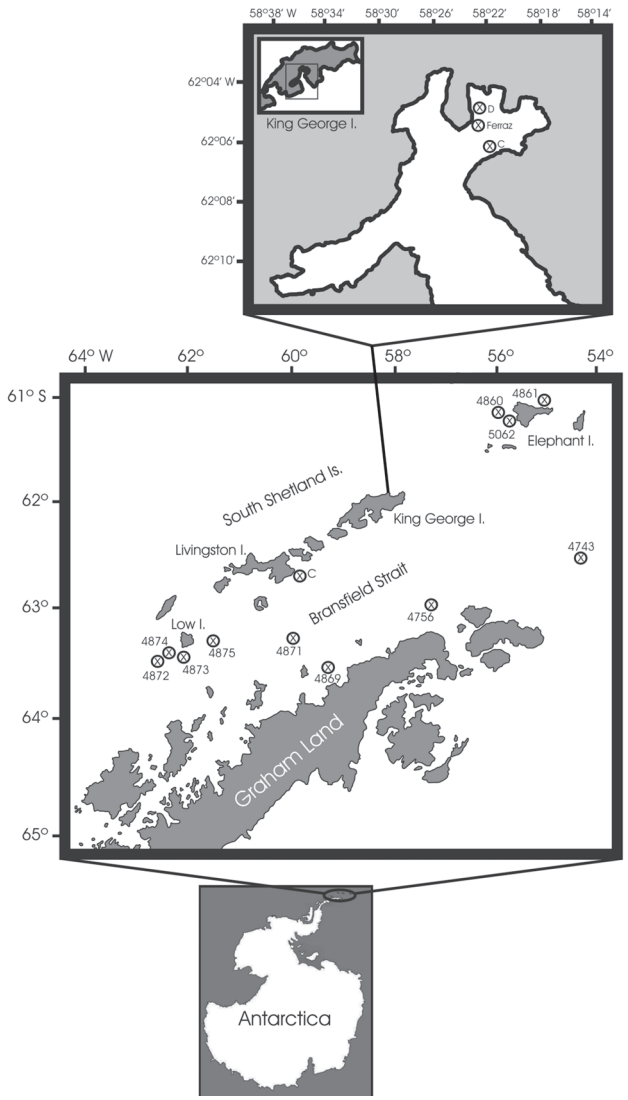


Figure 1. Location of the collecting area.

RESULTS

Spirophorida Bergquist & Hogg, 1969

Tetillidae Sollas, 1886

Cinachyra antarctica (Carter, 1872)

Figs 2-11, Tab. I

Tethya antarctica Carter, 1872: 412, pl. XX, figs 1-10.

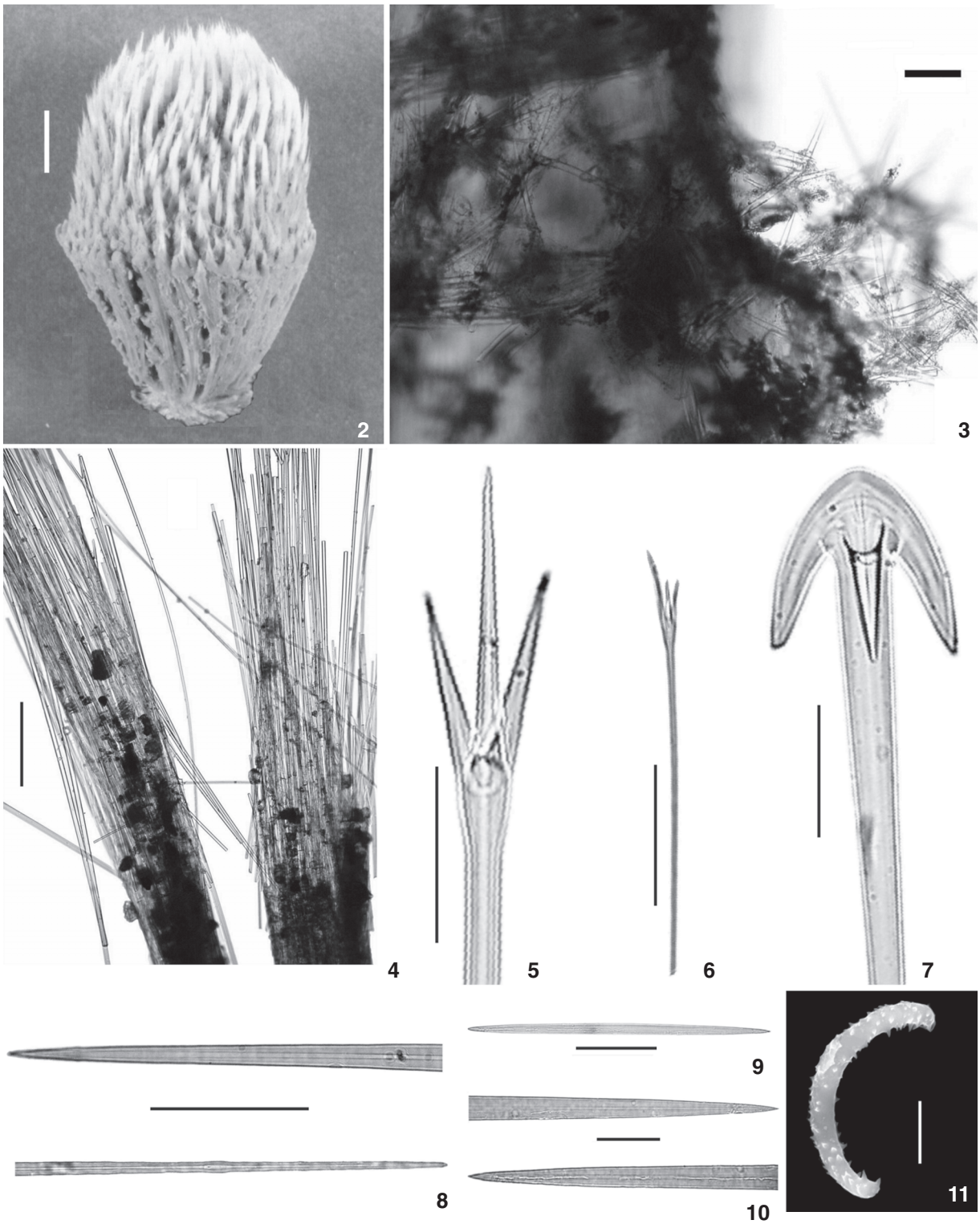
Cinachyra antarctica; Burton, 1932: 264, 1938: 5; Koltun, 1976: 167; Desqueyroux, 1975: 55, pl. I, figs 10-12; Desqueyroux-Faúndez, 1989: 104, pl. 1, figs 3a-c, pl. 6, figs 33-34; Barthel *et al*., 1990: 122, 1997: 47; Gutt & Koltun, 1995: 230.

Further synonym see Desqueyroux (1975).

Material studied. MCNPOR 1959, St. 4873, Bransfield Strait: 63°25'S-62°05'W, 66 m, 13.II.1986, PROANTAR IV; MCNPOR 1978, 1980, St. 4874, Bransfield Strait: 63°25'S-62°19'W, 135 m, 14.II.1986, PROANTAR IV.

Material examined for comparison. *Cinachyra antarctica* (Carter, 1872), collected by Mawson Antarctic Expedition, locality unknown, slide BMNH 1935.10.26.53.

Description. (MCNPOR 1959) (Fig. 2) Oval specimen; dimensions, in cm: 4.8 diameter, 7.0 height; surface with protruding spicules in long bundles, up to 2.0 cm lenght; oscules not observed; abundant pores (< 0.1 cm in diameter), mainly in the lateral portion. Preserved material firm in consistency; colour beige. MCNPOR 1978 consists of two individuals, both of globular format, bearing the same details in comparison to MCNPOR 1959, however their superficial spicule bundles are not so long (< 1.0 cm); dimensions, in cm: 1.4 x 1.1, and 0.9 x 0.8. MCNPOR 1980 is identical to MCNPOR 1959; dimensions, in cm: 3.7 x 2.6 x 2.4.



Figures 2-11. *Cinachyra antarctica*: (2) preserved specimen; (3) ectosomal arrangement of the skeleton; (4) choanosomal tracts; (5) protriaene I; (6) protriaene II; (7) anatriaene; (8) oxea I; (9) oxea II; (10) detail of oxea II extremities; (11) sigmaspire. Scale bars: (2) 1 cm; (3) 300 µm; (4) 750 µm; (5), (6), (7) 100 µm; (8), (9) 200 µm; (10) 50 µm; (11) 5 µm.

Table I. Spicules measurements (µm). * Measures are mention total length/rhabdome width.

MCNPOR	Protriaene I			Protriaene II*	Anatriaene			Oxea I	Oxea II	Sigmaspire
	Cladome	Clad	Rhabdome		Cladome	Clad	Rhabdome			
Cinachyra antarctica										
1959	50-70-94	161-215-274/ 11.5-14-16	5773-9228-13984/ 16-20-24	722-870-9- 88/2.5	159- 198-237	145-185-221/ 21-28-35	7820-11526- 19757/28-35-38	4600-6665- 7958/41-62-77	560-696-902/ 16-20-23	14-16-18.5/<1.0
1978	53-68-92	145-183-244/ 11.5-13-15	5383-8835-13225/ 15-18-21	741-827-9- 31/2.5	80.5- 97-120	87-124-145/ 15-19-23	7774-9871- 12926/23-26-31	3197-3969- 4761/32-39-47	655-771-874/ 17-20-24	13-15-17/<1.0
1980	46-68-99	136-171-207/ 13-14.5-18	5980-9054-13110/ 16-18-22	655-850-1- 026/2.5	108- 138-198	128-157-220/ 20-26-32	8700-11237- 15575/30-32-35	4675-7414- 9125/44-55-66	630-772-910/ 16-19-22	13-15-17/<1.0
Cinachyra barbata										
1979	42-68-92	110-134-182/ 10-15-20	4060-4820-5360/ 14-19-25	693-1079- 1463/2.5	100- 123-152	137-166-207/ 22-28-37	4800-7457- 11220/26-32-36	3160-5551- 7160/30-57-72	370-602-900/ 29-53-65	9.0-11.5-14/<1.0
2017	37-53-67	99-133-156/ 8.0-11-18	2507-3323-4324/ 14-15-16	750-980- 1216/2.5	145- 168-184	142-163-191/ 21-25-32	2392-3304- 4209/29-31-32	2001-2432- 3059/25-30-37	295-448-617/ 25-33-43	9.0-13-16<1.0
Craniella leptoderma										
2000	35-59-80	103-150-198/ 4.5-10-15	5497-7187-8602/ 9.0-14-20	741-936- 1254/2.5	76- 120-198	115-150-232/ 12-17-23	7084-10557- 13662/20-22-25	3726-6770- 9384/32-57-90	483-1090-1728- /12-21-33	10-13-16/<1.0
3143	48-70-110	120-161-200/ 6.0-10-15	4692-6311-7912/ 10-14-18	790-916- 1010/2.5	110- 141-190	115-163-192/ 18-24-30	5440-9607- 13440/20-21-23	5865-7786- 9223/55-73-99	460-859-1725/ 14-18-24	9.0-13-16/<1.0

Skeleton. Ectosome constituted by oxeas II densely disposed, perpendicular to the surface (Fig. 3). Choanosome formed by thick radial tracts of protriaenes I, anatriaenes e oxeas I (420-810 µm thickness), which protrude at the surface (Fig. 4); between the tracts it can be observed oxeas I, II, protriaenes II and sigmaspires randomly arranged.

Spicules. Megascleres: protriaenes I – with clads of varied length (136-*189.6*-274/11.5-*13.8*-18 µm) cladome 46-*68.7*-99 µm, rhabdome long, straight and sinuous, filiform at terminal portion (Fig. 5) (5383-*9039*-13984/15-*18.6*-24 µm); protriaenes II – cladome and rhabdome similar to protriaenes I (Fig. 6) (655-*849*-1026/2.5 µm); anatriaenes – cladome (80.5-*144.3*-237 µm) with uniform clads (87-*155.3*-221/15-*24.3*-35 µm), with a slight apical prominence at their medium portion (Fig. 7), rhabdome long, straight and sinuous (7774-*10878*-19757/23-*31*-35 µm); oxeas I – straight, acerate extremities, some of them slightly blunt (Fig. 8) (3197-*6016*-9125/32-*52*-77 µm); oxeas II – straight (Fig. 9), acerate extremities (Fig. 10) (560-*746.3*-910/16-*19.6*-24 µm). Microscleres: sigmaspires (Fig. 11) – often in "C", a few in "S" shape (13-*15.3*-18.5/< 1.0 µm). All measurements are given in table I.

Remarks. Burton (1929) included the species in *Cinachyra*, considering *C. vertex* Lendenfeld, 1907 as a synonym of *C. antarctica*, and alleged that the absence of sigmaspires described by Carter (1872) for the holotype could not be correct. Koltun (1964) included in the synonymy the variety *monticularis*, proposed by Kirkpatrick (1908), who observed different patterns of pores and oscules; however, these characters were not strong enough to allow the taxa to be considered distinct.

The material examined for comparison is very similar to the collected material.

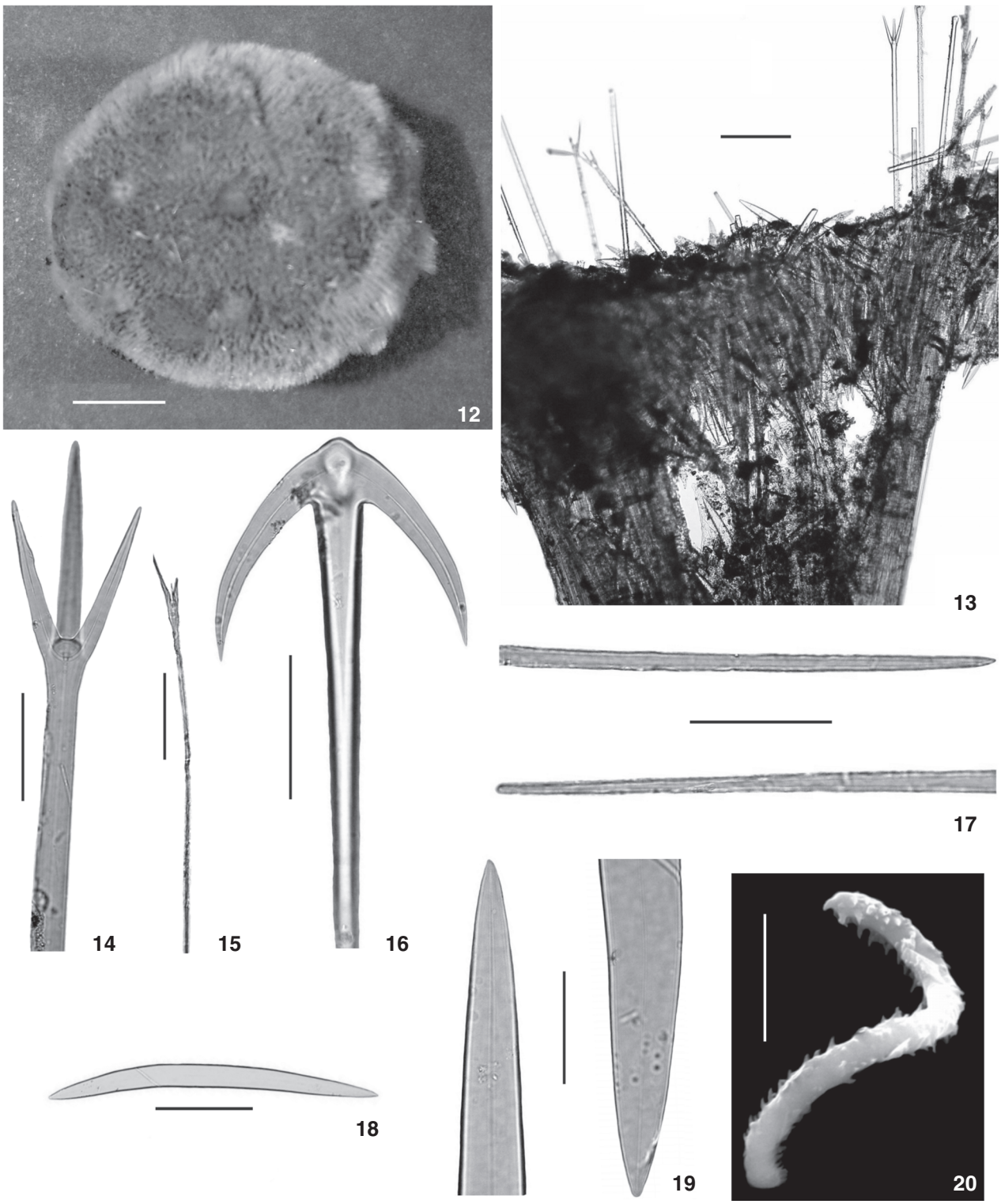
Distribution. Indian Ocean: Kerguelen I. (Carter 1879). South America: South Georgia I. (Burton 1932). Antarctica: Ross Sea (Carter 1872, Sollas 1888); Victoria Land (Kirkpatrick 1908, Broendsted 1926, Burton 1929, Koltun 1964); Adelie Land (Burton 1938, Vacelet & Arnaud 1972); Wilhelm II Land (Lendenfeld 1907); McRobertson Land (Koltun 1964); Enderby Land (Koltun 1976); Graham Land (Topsent 1917, Desqueyroux 1972); Weddell Sea (Barthel *et al.* 1990, 1997, Gutt & Koltun 1995); South Shetland Is.: Low I. (Desqueyroux 1975); Bransfield Strait (Desqueyroux-Faúndez 1989, present study). Bathymetry: 18 m (Kirkpatrick 1908) to 830 m (Gutt & Koltun 1995).

Cinachyra barbata Sollas, 1886

Figs 12-20, Tab. I

Cinachyra barbata Sollas, 1886: 183; Burton, 1932: 265, 1940: 98; Koltun, 1976: 167; Desqueyroux, 1975: 55, pl. I, figs 10-12; Desqueyroux-Faúndez, 1989: 103, pl. 1, figs 2a-e, pl. 6, figs 32; Barthel *et al.*, 1990: 122, 1997: 47; Sarà *et al.* 1990: 252; Pansini *et al.*, 1994: 68, fig. 4, pl. I, figs 3a-d; Gutt & Koltun, 1995: 230; Cattaneo-Vietti *et al.*, 1999: 540.
Further synonym see Desqueyroux (1975, 1989).

Material studied. MCNPOR 1979, 2017, St. 4874, Bransfield Strait: 63°25'S-62°19'W, 135 m, 14.II.1986, PROANTAR IV.



Figures 12-20. *Cinachyra barbata*: (12) preserved specimen; (13) skeleton; (14) protriaene I; (15) protriaene II; (16) anatriaene; (17) oxea I; (18) oxea II; (19) detail of oxea II extremities; (20) sigmaspire. Scale bars: (12) 1 cm; (13) 500 µm; (14) 150 µm; (15) 75 µm; (16) 150 µm; (17) 100 µm; (18) 300 µm; (19) 100 µm; (20) 5 µm.

Material examined for comparison. *Cinachyra barbata* Sollas, 1886, collected by Antarctic Discovery Expedition, locality unknown, slide BMNH 1908.2.5.52g-x.

Description. (MCNPOR 1979) (Fig. 12) Globular specimen; dimensions, in cm: 2.5 height, 3.5 width, 3.2 thickness; hispid surface; oscules regularly distributed (0.1-0.25 cm in diameter), surrounded by spicule brushes that reach 0.2 cm in height; pores not observed. Preserved material slightly compressible in consistency; colour grey with some cleared areas beige. MCNPOR 2017 a small sample, with the same characteristics presented by MCNPOR 1979, dimensions, in cm: 1.2 height, 1.0 width, 0.8 thickness; two oscules observed (0.1-0.3 cm in diameter).

Skeleton. (Fig. 13) Thick cortex, formed by oxeas II in palisade, perpendicular to the surface. Choanosome constituted by radial spicule tracts formed by protriaenes, anatriaenes and oxeas I (120-500 µm thickness), from the basal portion towards the surface, crossing the cortex and protruding the surface. Sigmaspires and protriaenes II dispersed along the skeleton.

Spicules. Megascleres: protriaenes I – with clads of varied length (Fig. 14) (99-*133*.*5*-182/8.0-*13*-20 µm), cladome 37-*60*.*5*-92 µm, rhabdome long and straight (2507-*4071*.*5*-5360/14-*17*-25 µm); protriaenes II – cladome identical to protriaenes I (Fig. 15), rhabdome generally filiform and sinuous toward the terminal portion (693-*1029*.*5*-1463/2.5 µm); anatriaenes – cladome (100-*145*.*5*-184 µm) with clads (137-*164*.*5*-207/21-*26*.*5*-37 µm) lightly curved toward the rhabdome (Fig. 16), extremity sinuous and filiform (2392-*5380*.*5*-11220/26-*31*.*5*-36 µm); oxeas I – slightly curved, acerate points, a few blunted (Fig. 17) (2001-*3976*.*5*-7160/25-*43*.*5*-72 µm); oxeas II – slightly curved (Fig. 18), acerate extremities (Fig. 19) (295-*525*-900/25-*43*-65 µm). Microscleres: sigmaspires (Fig. 20) – morphology varying from "C" to twisted forms (9.0-*12*.*3*-16/< 1.0 µm). All measurements are given in table. I.

Remarks. Sollas (1888) provided an extensive and detailed description of almost all the morphological characteristics, and Kirkpatrick (1905) extended the description with additional details on the oscules and other surface structures, which were also observed in the samples studied for this report.

Although there may be doubt in regard to the valid species of *Cinachyra*, in the present study *C. barbata* and *C. antactica* were treated as separate species, because of the existence of at least two distinctive morphological characteristics (external morphology, size and shape of oxeas II), observed not only in the newly collected specimens but also in the comparative material. Van Soest & Rützler (2002) cited in the diagnosis of the genus the existence of only one species (in this case *C. barbata*); however, until now the two species have not been formally synonymized.

Distribution. Indian Ocean: Kerguelen I. (Sollas 1886, 1888, Lendenfeld 1907, Boury-Esnault & Van Beveren 1982). South America: South Georgia I. (Burton 1932, 1940). Antarctica: Victoria Land (Kirkpatrick 1908, Burton 1929, Sarà *et al*. 1990, Pansini *et al*. 1994, Cattaneo-Vietti *et al*. 1999); Wilhelm II Land (Koltun 1964); McRobertson Land; Enderby Land (Koltun 1976); Weddell Sea (Barthel *et al*. 1990, 1997, Gutt & Koltun 1995); South Shetland Is.: Robert I.; King George I. (Desqueyroux-Faúndez 1989); Bransfield Strait (present study); Deception I. (Desqueyroux 1975). Bathymetry: 2 m (Koltun 1976) to 830 m (Gutt & Koltun 1995).

Craniella leptoderma (Sollas, 1886)

Figs 21-29, Tab. I

Tetilla leptoderma Sollas, 1886: 179; Burton, 1929: 418; Koltun, 1976: 166; Desqueyroux & Moyano, 1987: 47; Desqueyroux-Faúndez, 1989: 102, pl. I, figs 1a-d, pl. V, figs 26-28; Sarà *et al*., 1990: 252; Barthel *et al*., 1990: 122, 1997: 47; Gutt & Koltun, 1995: 230; Cattaneo-Vietti *et al*., 1999: 540.

Further synonym see Burton (1929) and Desqueyroux-Faúndez (1989).

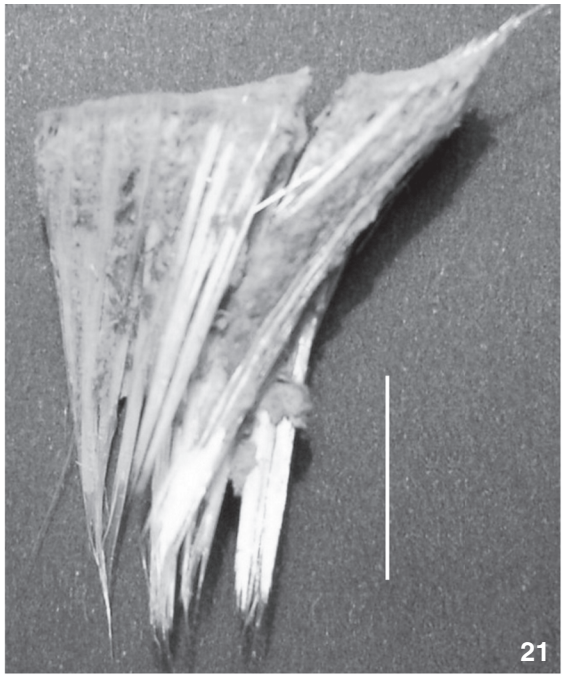
Material studied. MCNPOR 2000, St. 4861, Elephant I.: 61º02'S-54º55'W, 362 m, 01.II.1986, PROANTAR IV; MCNPOR 3143, St. 4860, Elephant I.: 61º08'S-55º52'W, 112 m, 31.I.1986, PROANTAR IV.

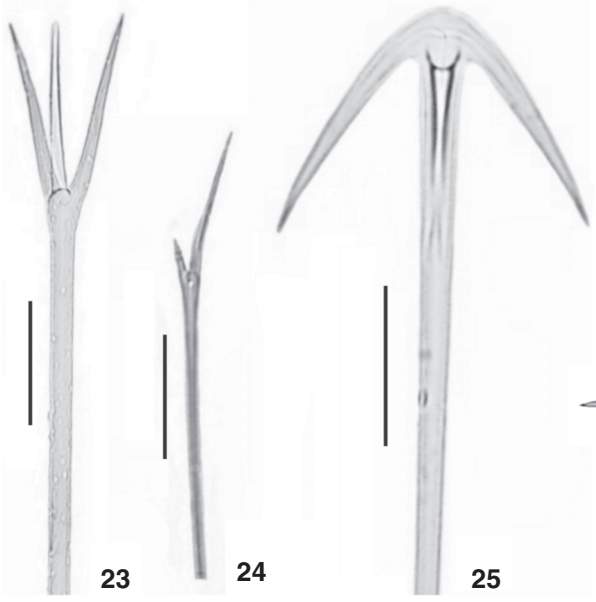
Description. (MCNPOR 3143) (Fig. 21) Fragment; dimensions, in cm: 2.8 height, 2.2 width, 0.65 thickness; hispid surface; pores and oscules not observed. Preserved material hard in consistency; colour brown. MCNPOR 2000 an amorphous, damaged fragment, formed by disperse spicule tracts, with exogenous material, colour grey; dimensions, in cm: 4.8 height, 3.4 width, 0.8 thickness.

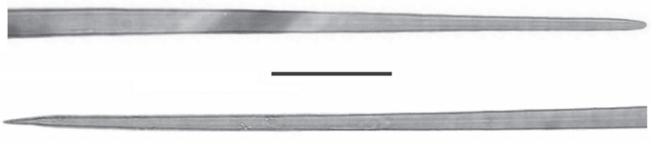
Skeleton. (Fig. 22) Cortical region composed by oxeas II in parchment; it was also observed a small amount of foreign material. Choanosome made by thick longitudinal multispicular tracts of oxeas I and anatriaenes (250-530 µm thickness), radially disposed, originating from the basal portion until the surface, where it protrudes considerably. Microscleres and protriaenes II dispersed along the choanosome, mainly between the tracts.

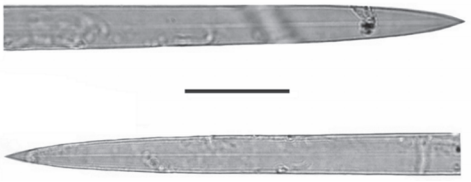
Spicules. Megascleres: protriaenes I – cladome (35-*64*.*5*-110 µm) often with unequal clads (103-*155*.*5*-200/4.5-*10*-15 µm) (Fig. 23), rhabdome long, straight, extremity sharp-pointed and sinuous (4692-*6749*-8602/9.0-*14*-20 µm); protriaenes II – cladome similar to protriaene I (Fig. 24), rhabdome thin and sinuous (741-*926*-1254/2.5 µm); anatriaenes – cladome 76-*130*.*5*-198 µm, with uniform clads (115-*156*.*5*-232/12-*20*.*5*-30 µm) (Fig. 25), rhabdome identical to protriaenes (5440-*10082*-13662/20-*21*.*5*-25 µm); oxeas I – straight, conical and/or acerate extremities (3726-*7278*-9384/32-*65*-99 µm) (Fig. 26); oxeas II – straight or slightly curved (Fig. 27), with acerate extremities (483-*974*.*5*-1728/12-*19*.*5*-33 µm) (Fig. 28). Microscleres: sigmaspires (Fig. 29) – in "C" shape, rarely in "S" (9.0-*13*-16/< 1.0 µm). All measurements are given in Tab. I.

Remarks. Although the two samples of *C. leptoderma* here identified are only fragments, it is possible to observe that it has certain variation in the external form for such species, cor-









Figures 21-29. *Craniella leptoderma*: (21) preserved specimen; (22) skeleton; (23) protriaene I; (24) protriaene II; (25) anatriaene; (26) oxea I; (27) oxea II; (28) detail of oxea II extremities; (29) sigmaspire. Scale bars: (21) 1 cm; (22) 750 µm; (23) 200 µm; (24) 50 µm; (25) 150 µm; (26), (27), (28) 300 µm; (29) 5 µm.

roborating with the affirmation of Desqueyroux (1975). The two samples from the present study are a bit different; however the spicules are identical in both samples and confirm the identification.

According to Van Soest *et al*. (2005), currently the species belongs to the genus *Craniella*.

Distribution. Indian Ocean: Kerguelen I. (Boury-Esnault & Van Beveren 1982); Heard I.; Christmas I. (Sollas 1886, 1888). South America: Argentina (Sollas 1886, 1888); Chile (Desqueyroux & Moyano 1987); Falkland Is.; South Georgia I. (Burton 1932). Antarctica: Victoria Land (Kirkpatrick 1908 Broendsted 1926 Burton 1929, Sarà *et al*. 1990, Cattaneo-Vietti *et al*. 1999); Wilhelm II Land (Lendenfeld 1907); Adelie Land (Burton 1938); McRobertson Land; Princess Elisabeth Land; Banzare Land; Clarie Land (Koltun 1964); Enderby Land; Sabrina Land (Koltun 1976); Graham Land (Desqueyroux-Faúndez 1989); Weddell Sea (Barthel *et al*. 1990, 1997, Gutt & Koltun 1995); South Shetland Is.: Greenwich I. (Desqueyroux 1975); King George I. (Koltun 1964); Clarence I. (Burton 1932); Elephant I. (present study). Bathymetry: 4 to 2267 m (Koltun 1976).

Astrophorida Sollas, 1888
Ancorinidae Schmidt, 1870
Tethyopsis longispinum (Lendenfeld, 1907)
Figs 30-37, Tab. II

Tribrachion longispinum Lendenfeld, 1907: 322, pl. XXIV, figs 1-13.
Monosyringa longispinna; Koltun, 1976: 166; Barthel *et al*., 1990: 122, 1997: 47; Gutt & Koltun, 1995: 230.
Monosyringa broendstedi Burton, 1929: 415, pl. IV, fig. 1, text-fig. 4.
Further synonym see Koltun (1976).

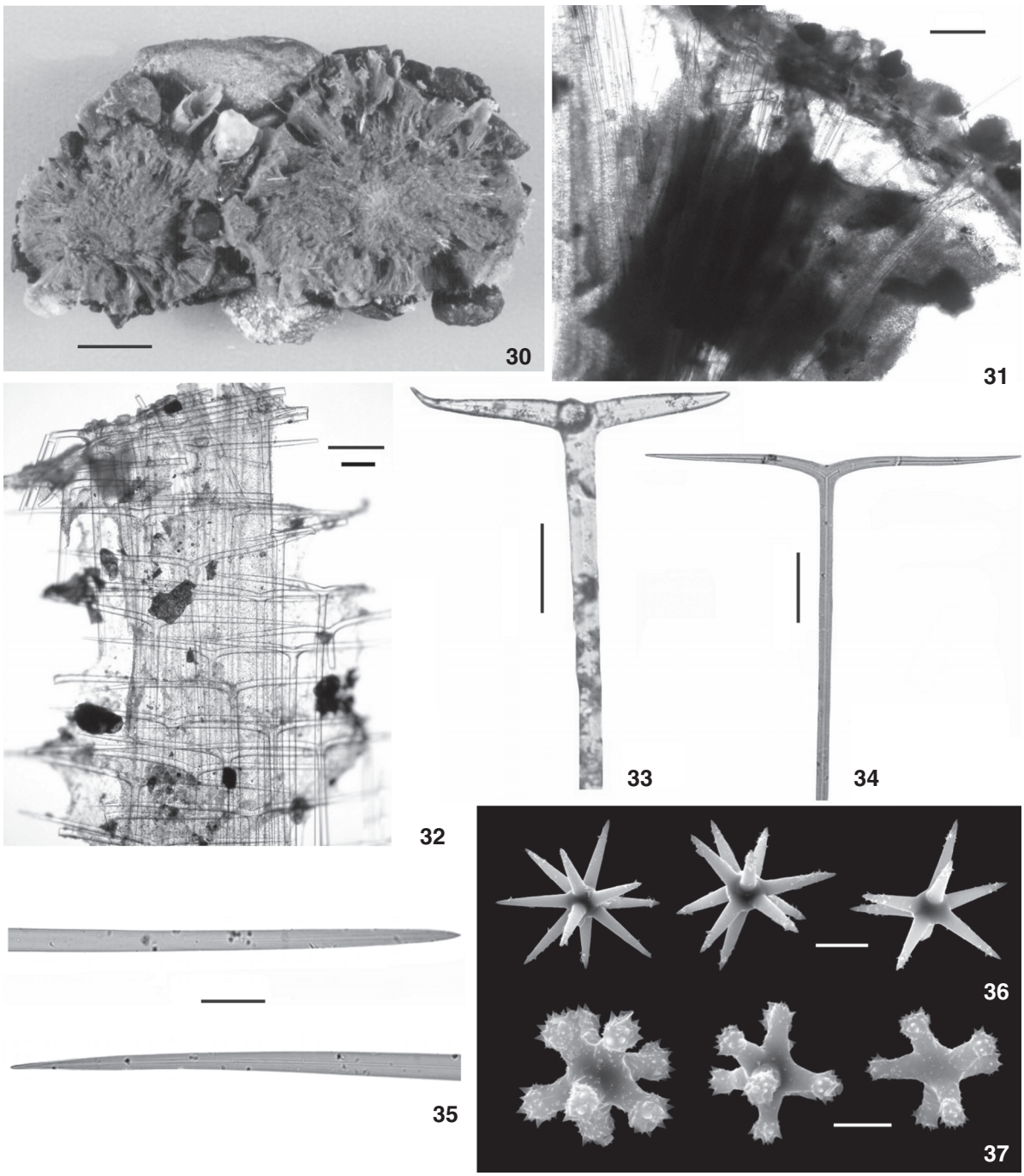
Material studied. MCNPOR 3164, St. Ferraz, King George I.: 62º05'S-58º23'W, 20 m, 03.II.1985, PROANTAR III; MCNPOR 3123, St. 4743, Bransfield Strait: 62°30'S-54°16'W, 412 m, 28.I.1985, PROANTAR III; MCNPOR 3121, Est. 4756, Bransfield Strait: 62°58'S-57°10'W, 70 m, 02.II.1985, PROANTAR III.

Description. (MCNPOR 3123) (Fig. 30) Massive, amorphous fragment; dimensions, in cm: 6.8 x 3.4, 1.7 thickness; hispid surface; the surface has small tubular cylindrical projections (0.2-0.8 cm height), with the oscular openings on top (0.1 cm in diameter). Preserved material firm in consistency; colour pinkish with greyish regions. MCNPOR 3121 and 3164 are identical to MCNPOR 3123, with same consistency and colour, as well as their superficial tubular projections; dimensions, in cm: 4.0 x 2.2, 1.8 thickness, and 3.5 x 3.0, 2.5 thickness, respectively.

Skeleton. (Fig. 31) Cortex composed by microscleres and cladomes of orthotriaenes, together with a great amount of exogenous material and spongin. Choanosome with radial arrangement, with megascleres arranged in multispicular tracts (230-500 µm thick), perpendicular to the sponge surface. Between the tracts there are abundant microscleres and spongin.

Table II. *Tethyopsis longispinum*: spicules measurements (µm).

MCNPOR	Orthotriaene			Orthodiaene			Oxea	Oxyaster	Strongylaster
	Cladome	Clad	Rhabdome	Cladome	Clad	Rhabdome			
3121	1080-1217-1360	490-600-700/ 62-83-100	3680-4291-4620/ 70-87-100	360-1214-1800	130-589-1020/ 16-37-51	860-2400-4700/ 18-34-52	1320-2240-3920/ 14-26-45	25-34-45	10-12-15
3123	1220-1342-1520	570-674-810/ 78-88-97	2860-4092-4780/ 75-87-100	540-1195-1700	240-595-910/ 24-40-54	1420-3230-4700/ 23-38-52	1100-2106-3420/ 17-23-31	25.3-35-44	10-13-16
3164	820-956-1160	310-465-560/ 70-82-95	2400-3798-4620/ 60-81-101	300-1144-1560	160-564-750/ 19-37-47	1500-3271-4160/ 29-40-45	1240-1936-3080/ 15-24-32	25-36-45	10-13-16



Figures 30-37. *Tethyopsis longispinum*: (30) preserved specimen; (31) skeleton; (32) spicular arrangement of tubular projections; (33) ortotriaene; (34) ortodiaene; (35) oxea; (36) oxyasters; (37) strongylasters. Scale bars: (30) 1 cm; (31), (32), (33) 500 µm; (34), (35) 300 µm; (36) 10 µm; (37) 5 µm.

Oscular projections are formed exclusively by an arrangement of orthodiaenes regularly overlapped (Fig. 32), involved in a fine membrane in which microscleres are present.

Spicules. Megascleres: orthotriaenes – cladome 1080-*1171.6*-1520 µm, with often sinuous clads (310-*579.6*-810/62-*84.3*-100 µm) (Fig. 33), rhabdome with rounded apical extrem-

ity (2400-*4060.3*-4620/60-*85*-101 µm); orthodiaenes – cladome of varied angle (300-*1184.3*-1800 µm), straight to sinuous clads (130-*582.6*-1020/16-*38*-54 µm) (Fig. 34), rhabdome straight or slightly curved (860-*2967*-4700/18-*37.3*-52 µm); oxeas – straight, slightly to sharply curved; extremities varying from hastate to acerate (1100-*2094*-3920/14-*24.3*-45 µm) (Fig. 35). Microscleres: oxyasters (Fig. 36) – 05-10 rays, slightly microspined, concentrated at apical portion (25-*35*-45 µm); strongylasters (Fig. 37) – 04-07 rays, bearing microspines at the apical portion of the rays (10-*12.6*-16 µm). All measurements are given in Tab. II.

Remarks. According to Koltun (1964), *Monosyringa broendstedi* Burton, 1929 differs from *T. longispinum* only in having some bifurcation in regard to the clads of the triaenes and diaenes; this characteristic has no taxonomic value, being only a modified form.

This species tends to live totally embedded in the substrate, with only the papillae protruding (Barthel *et al*. 1991). It seems to have an important ecological role, providing a special environment for sea stars, which sometimes are concentrated over and between the papillae.

For the first time, SEM photomicrographs of microscleres are provided, making it possible to observe the microspine pattern and the arrangement of the rays in these spicules.

Distribution. Antarctica: Wilhelm II Land (Lendenfeld 1907); Victoria Land (Burton 1929); McRobertson Land; Knox Land; Banzare Land (Koltun 1964); Enderby Land (Koltun 1976); Weddell Sea (Barthel *et al*. 1990, 1997, Gutt & Koltun 1995); Bransfield Strait (present study); South Shetland Is.: King George I. (present study). Bathymetry: 20 m (present study) to 1340 m (Koltun 1964).

Hadromerida Topsent, 1894
Polymastiidae Gray, 1867
Polymastia invaginata Kirkpatrick, 1907
Figs 38-44

Polymastia invaginata Kirkpatrick, 1907: 271; Burton, 1929: 446, 1932: 338 1938: 19; Koltun, 1976: 168; Vacelet & Arnaud, 1972: 14; Desqueyroux, 1976: 95; Desqueyroux & Moyano, 1987: 47; Desqueyroux-Faúndez, 1989: 106, pl. II, figs 5a-d, pl. VI, figs 36-37; Barthel *et al*., 1990: 122, 1997: 47; Gutt & Koltun, 1995: 230; Pansini & Sarà, 1999: 205.

Further synonym see Desqueyroux-Faúndez (1989).

Material studied. MCNPOR 1976, St. 4874, Bransfield Strait: 63°25'S-62°19'W, 135 m, 14.II.1986, PROANTAR IV.

Material examined for comparison. *Polymastia invaginata* Kirkpatrick, 1907, collected by Antarctic Discovery Expedition, locality unknown, slide BMNH 1908.2.5.76.

Description. (Fig. 38) Massive specimen; dimensions, in cm: 3.9 x 2.0, 1.7 thickness; hispid surface; papillae 0.1-0.25 cm height, with oscular openings at the apex (0.1 cm in diameter). Preserved material firm, incompressible in consistency; external colour beige, darker internally.

Skeleton. (Fig. 39) Upper portion formed by the cortex, which is not easily detachable, 580-980 µm thickness, composed by ectosomal tylostyles in palisade, often with the apical extremity protruding through the surface. Choanosome formed by a radial arrangement of multispicular tracts, composed exclusively of choanosomal tylostyles; tracts 270-360 µm thick. The spicular arrangement present in the papillae is composed of choanosomal tylostyles, positioned perpendicularly to the surface (Fig. 40).

Spicules. Megascleres: ectosomal tylostyles – straight or slightly curved, lightly swollen along the shaft (Fig. 41); tyle well defined (Fig. 42): 120-*369.2*-660/3.8-*13.1*-25 µm, tyle width 5.0-*9.4*-12.5 µm; choanosomal tylostyles – straight (Fig. 43), tyle poorly defined (Fig. 44); shaft a bit swollen below the tyle: 880-*1400*-1860/12.5-*21.3*-27.5 µm, tyle width 10-*13.4*-16.3 µm.

Remarks. Both the ectosomal and choanosomal tylostyles are smaller in comparison to previous records (Kirkpatrick 1908, Koltun 1964, Desqueyroux 1976 Boury-Esnault & Van Beveren 1982, Desqueyroux-Faúndez 1989). Only the measurements provided by Hentschel (1914), who proposed the variety *gaussi*, are similar to those obtained in the sample studied here. Burton (1929) considered this to be intraspecific variation, and thought it unnecessary to create a new variety; this affirmation is corroborated by the present study.

Although there are small differences in the spicule sizes, the comparative material is quite similar to that observed in the present study, with respect to the general morphology of the spicules and the skeletal arrangement.

Distribution. Indian Ocean: Kerguelen I.; Heard I. (Boury-Esnault & Van Beveren 1982). South America: Chile (Desqueyroux 1976, Desqueyroux & Moyano 1987); Magellan Strait (Pansini & Sarà 1999); South Georgia I.; South Orkney Is. (Burton 1932 1934). Antarctica: Graham Land (Desqueyroux-Faúndez 1989); Victoria Land (Kirkpatrick 1907 1908; Burton 1929); Adelie Land (Burton 1938, Vacelet & Arnaud 1972); Wilhelm II Land (Hentschel 1914); Knox Land (Burton 1938); Princess Ragnhild Land (Koltun 1964); Enderby Land; McRobertson Land (Koltun 1976); Weddell Sea (Barthel *et al*. 1990, 1997, Gutt & Koltun 1995); Bransfield Strait (Burton 1932, present study). Bathymetry: 18 m (Kirkpatrick 1907) to 1592 m (Burton 1938).

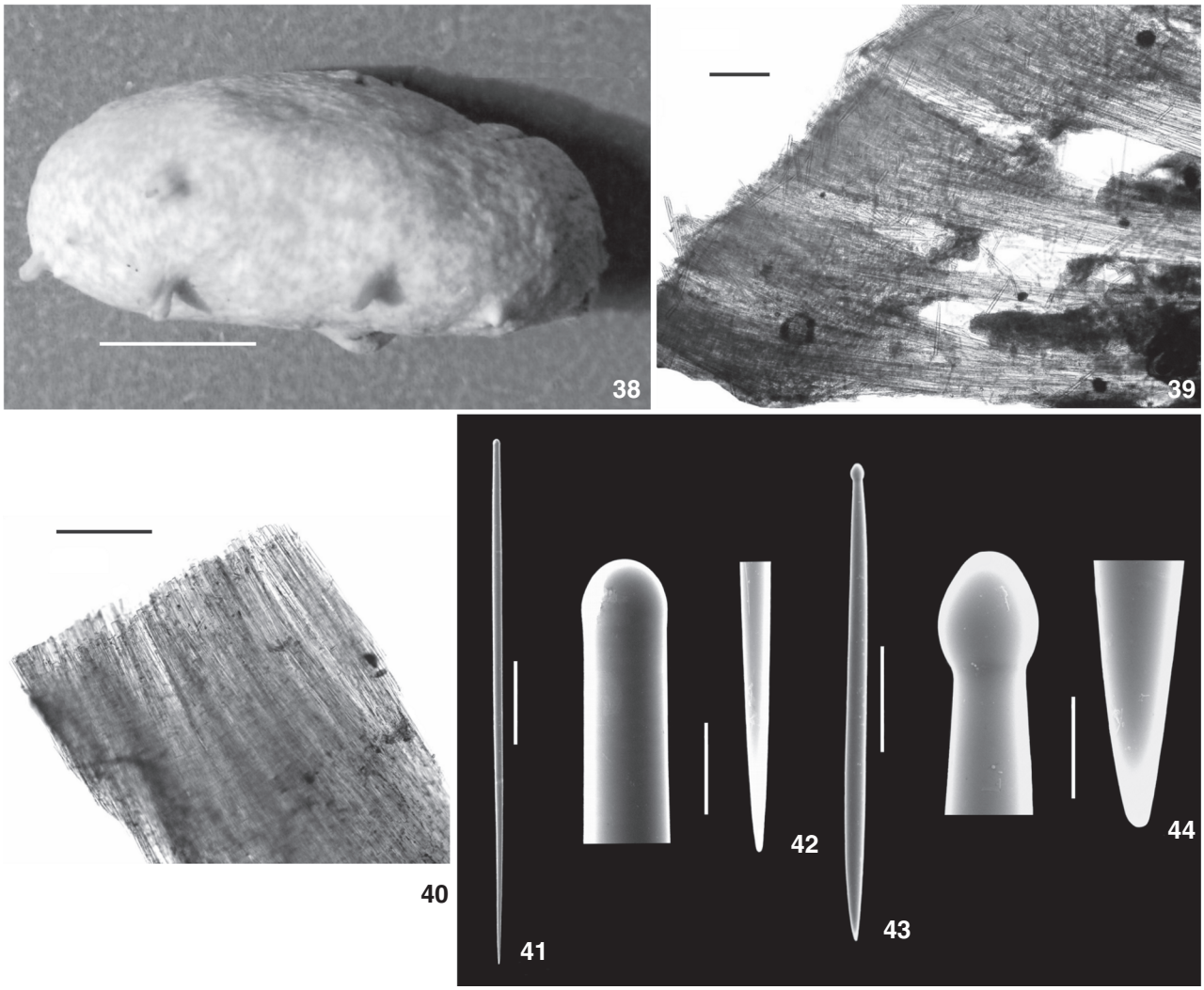
Suberitidae Schmidt, 1870
Homaxinella balfourensis (Ridley & Dendy, 1886)
Figs 45-49, Tab. III

Axinella balfourensis Ridley & Dendy, 1886: 480.

Homaxinella balfourensis; Lévi, 1964: 150, fig. 4, pl. I, fig. 4; Koltun, 1964: 84, pl. XIII, figs 11-12, 1976: 190; Vacelet & Arnaud, 1972: 15; Boury-Esnault & Van Beveren, 1982: 46, pl. VII, fig. 25, text-fig. 12a-b; Desqueyroux-Faúndez, 1989: 110, pl. II, fig. 8, pl. VII, figs 41-42; Pansini *et al*., 1994: 70; Barthel *et al*., 1997: 48; Cattaneo-Vietti *et al*., 1999: 540.

Further synonym see Koltun (1964).

Material studied. MCNPOR 3132, St. 5062, Elephant I.:



Figures 38-44. *Polymastia invaginata*: (38) preserved specimen; (39) skeleton; (40) spicules arrangement of papillae; (41) ectosomal tylostyles; (42) detail of ectosomal tylostyles extremities; (43) choanosomal tylostyles; (44) detail of choanosomal tylostyles extremities. Scale bars: (38) 1 cm; (39), (40) 500 µm; (41) 200 µm; (42) 20 µm; (43) 75 µm; (44) 10 µm.

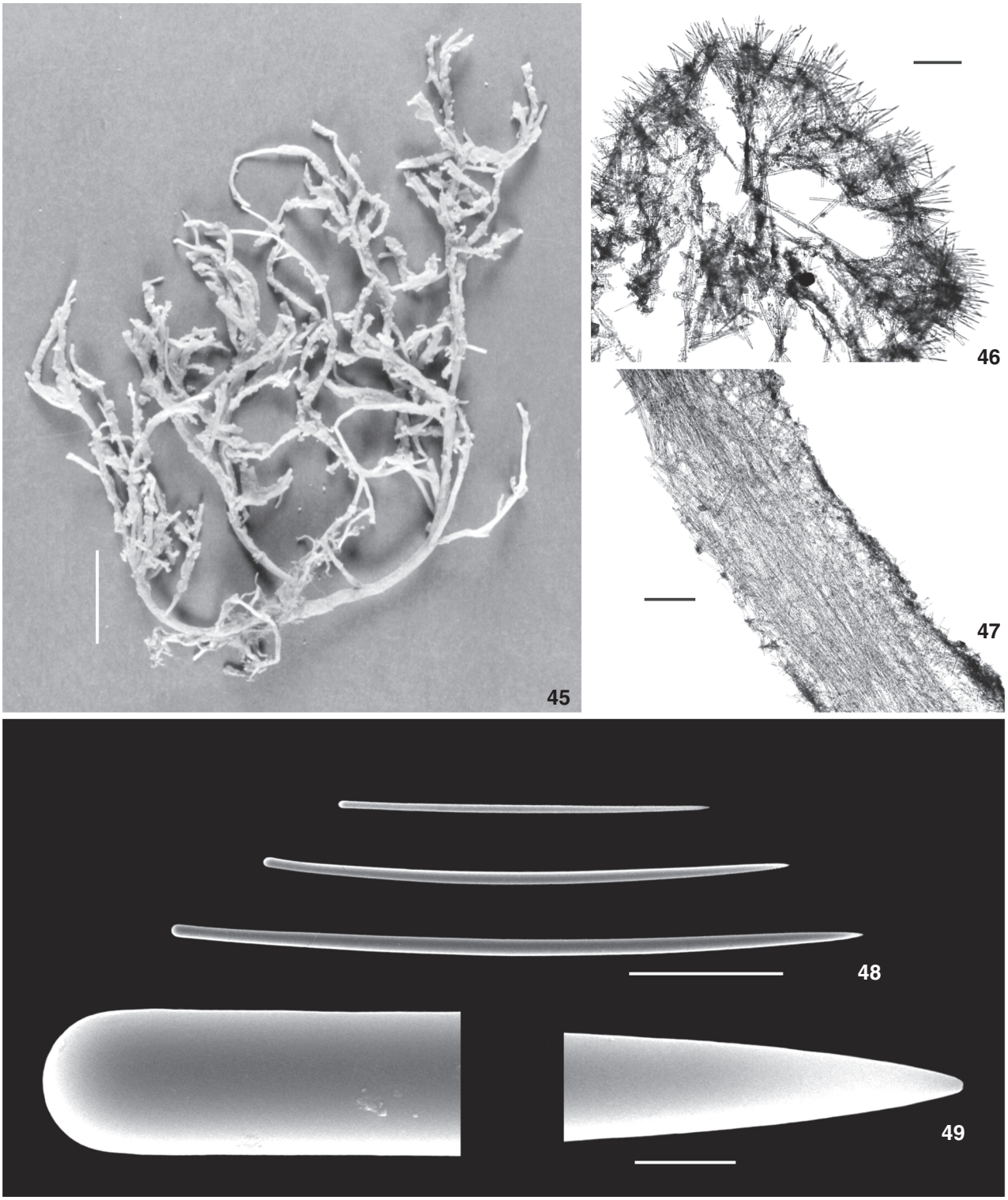
Table III. *Homaxinella balfourensis*: spicules measurements (µm).

MCNPOR	Styles
3111	152-326.7-550/2.5-6.4-10.4
3130	171-382.6-608/2.5-6.6-11.5
3132	114-324.7-522.5/2.5-7.0-11.5
3369	133-323.9-560.5/2.5-7.1-10.4

61º12'S-55º40'W, 98 m, 26.II.1987, PROANTAR V; MCNPOR 3130, St. D, King George I.: 62º05'S-58º23'W, 20 m, 26.II.1988, PROANTAR VI; MCNPOR 3369, St. D, King George I.: 62º05'S-58º23'W, 25 m, 21.I.1991, PROANTAR IX; MCNPOR 3111, St. C, King George I.: 62º06'S-58º22'W, 28 m, 06.III.1988, PROANTAR VI.

Material examined for comparison. *Homaxinella balfourensis* (Ridley & Dendy, 1886), colleted by Swedish Antarctic Expedition, off Seymour Island, Antarctic Peninsula, slide BMNH 1933.3.17.104.

Description. (MCNPOR 3132) (Fig. 45) Arborescent specimen, with several ramifications; dimensions, in cm: 22.4 height, 16.8 width, branches ranging from 0.2-0.45 in diameter; microhispid surface, with slight spicule protraction; oscules not observed. Preserved material slightly elastic but firm in consistency; colour greyish beige. MCNPOR 3111, 3130 and 3369 are all amorphous fragments, bearing the same consistency and



Figures 45-49. *Homaxinella balfourensis*: (45) preserved specimen; (46) transversal section of skeleton; (47) longitudinal section of skeleton; (48) styles; (49) detail of style extremities. Scale bars: (45) 3 cm; (46) 300 µm; (47) 500 µm; (48) 100 µm; (49) 5 µm.

colour in comparison to MCNPOR 3132; the three samples are not ramified and each one consists in cylindrical structures with not more than 10 cm length and 0.3 cm in diameter.

Skeleton. In transverse section the ectosome is made by discrete bouquets, characterizing the superficial hispidation (Fig. 46). Choanosome in longitudinal section with a dense internal axial arrangement formed by multispicular tracts, a great amount of sponging and free spicules (Fig. 47).

Spicules. Megascleres: styles – straight to slightly curved (Fig. 48), extremities varying from acerate to hastate (114-*339.5*-608/2.5-*6.8*-11.5 µm) (Fig. 49). All measurements are given in table III.

Remarks. This species is very common in the Antarctic continent, and several studies have treated its chemical composition and ecology (Seldes *et al*. 1986, McClintock 1987, Dayton 1989, Cerrano *et al*. 2000, Wilkins *et al*. 2002).

Skeletal and spicular features observed in the studied material are in accordance with comparative material. The axial arrangement of the choanosome and general features of ectosomal region are identical in both specimens, as well as the spicules (remeasured in BMNH 1933.3.17.104: styles 247-*423.9*-598.5/3.5-*7.2*-13.8 µm).

Distribution. Indian Ocean: Kerguelen I. (Ridley & Dendy 1886, 1887, Lévi 1964, Boury-Esnault & Van Beveren 1982). South America: South Georgia I. (Burton 1932, 1934). Antarctica: Graham Land (Topsent 1907, 1908, 1917); Victoria Land (Kirkpatrick 1908, Burton 1929, Pansini *et al*. 1994, Cattaneo-Vietti *et al*. 1999); Adelie Land (Vacelet & Arnaud 1972); Wilhelm II Land (Hentschel 1914); Queen Mary Land; Knox Land; Banzare Land; Princess Elisabeth Land (Koltun 1964); Enderby Land (Koltun 1976); Weddell Sea (Barthel *et al*. 1997); South Shetland Is.: Deception I. (Topsent 1917); Elephant I. (Desqueyroux-Faúndez 1989; present study); King George I. (present study). Bathymetry: 0 m (Desqueyroux-Faúndez 1989) to 550 m (Koltun 1964).

Suberites montiniger Carter, 1880

Figs 50-53

Suberites montiniger Carter, 1880: 256; Topsent, 1915: 39; Burton, 1932: 335; Koltun, 1964: 25, 1976: 169; Gutt & Koltun, 1995: 231; Barthel *et al*., 1997: 47; Cattaneo-Vietti *et al*., 1999: 540.
Suberella topsenti Burton, 1929: 446, pl. IV, fig. 5.
Further synonym see Koltun (1964).

Material studied. MCNPOR 1988, St. 4872, Bransfield Strait: 63º28'S-62º31'W, 168 m, 13.II.1986, PROANTAR IV.

Description. (Fig. 50) Globular specimen, fixed to a rock fragment; dimensions, in cm: 2.5 cm height, 2.2 cm in diameter; slightly hispid surface, with slightly protruded spicules; only one oscule present (0.2 cm in diameter), at the apex of sponge body. Preserved material hard consistency, colour brown.

Skeleton. (Fig. 51) Ectosome not specialized. Choanosome with spicules in confusion, densely arranged and positioned at diverse angles, mixed with abundant spongin. Several openings and canals could be observed along the choanosome.

Spicules. Megascleres: tylostyles – straights, slightly curved, sinuous or somewhat twisted (Fig. 52). Tyle ovalate, poorly developed, apical extremity varying from conical to acerate (Fig. 53): 330-*364*-410/7.5-*8.8*-10 µm, tyle width 7.5-*9.0*-10 µm.

Remarks. *Suberites montiniger* presents a taxonomic problem: originally the species was described by Carter (1880) for the Barents Sea, Glacial Arctic Ocean; and later Topsent (1915) recorded it for Antarctica. Our data can shed no light on the question of this disjunct distribution; although the populations in these regions may be two distinct species, a revision to elucidate this question is beyond the scope of this work.

Burton (1929), in describing *Suberella topsenti* for Antarctica, suggested it as a senior synonym of *S. montiniger*, alleging that the species described by Carter (1880) showed certain differences in the skeleton. Burton (1932) compared his material with the sample described by Carter (1880), considering both as identical samples. The lack of distinctive morphological characters in this species may have generated these conclusions, because the external morphology, skeletal architecture and spicules do not show variations that justify considering them as distinct taxa. The use of molecular techniques may assist in developing a more reliable diagnosis.

Distribution. Arctic Ocean, Barents Sea (Carter 1880). South America: Falkland Is. (Burton 1932); Burdwood Bank (Topsent 1915). Antarctica: Victoria Land (Burton 1929, Koltun 1964, Cattaneo-Vietti *et al*. 1999); McRobertson Land (Koltun 1976); Weddell Sea (Gutt & Koltun 1995, Barthel *et al*. 1997); Bransfield Strait (present study). Bathymetry: 91 m (Burton 1929) to 424 m (Gutt & Koltun 1995).

Halichondrida Gray, 1867

Halichondriidae Gray, 1867

Halichondria (Eumastia) attenuata (Topsent, 1915)

Figs 54-57

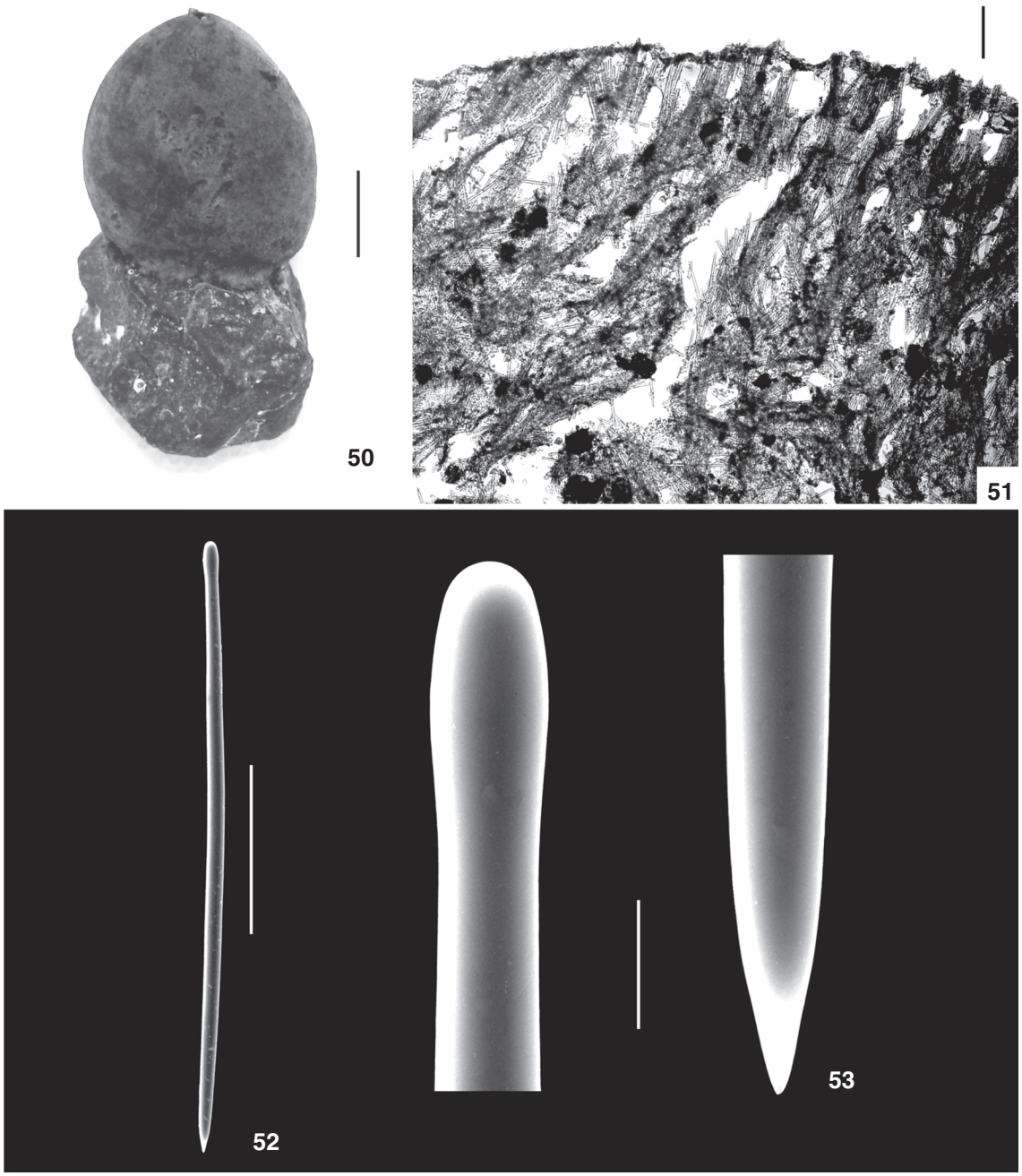
Eumastia attenuata Topsent, 1915: 35-37, figs 1, 2a-b; Burton, 1932: 335, 1934: 44.

Material studied. MCNPOR 5484, St. 4874, Bransfield Strait: 63º25'S-62º19'W, 135 m, 14.II.1986, PROANTAR IV.

Description. (Fig. 54) Irregular fragment; dimensions: 2.0 x 1.6 cm, 0.9 cm thick; slightly rugose surface, due to the presence of several ridges, not exceeding 0.1 cm height. The sample bears a very conspicuous cortex, detachable, slightly translucent, < 0.1 cm thick; oscules < 0.1 cm diameter. Preserved material lightly compressible in consistency; colour grayish white externally, light brown internally.

Skeleton. (Fig. 55) Ectosome formed by a cortical region, with a palisade of spicules, which protrude the surface, 530-870 µm width. Below the cortex subectosomal openings or canals were observed, disposed regularly. Choanosome with spicules arranged in confusion, some of them positioned perpendicularly to the surface.

Spicules. Megascleres: oxeas – straight, smooth (Fig. 56),



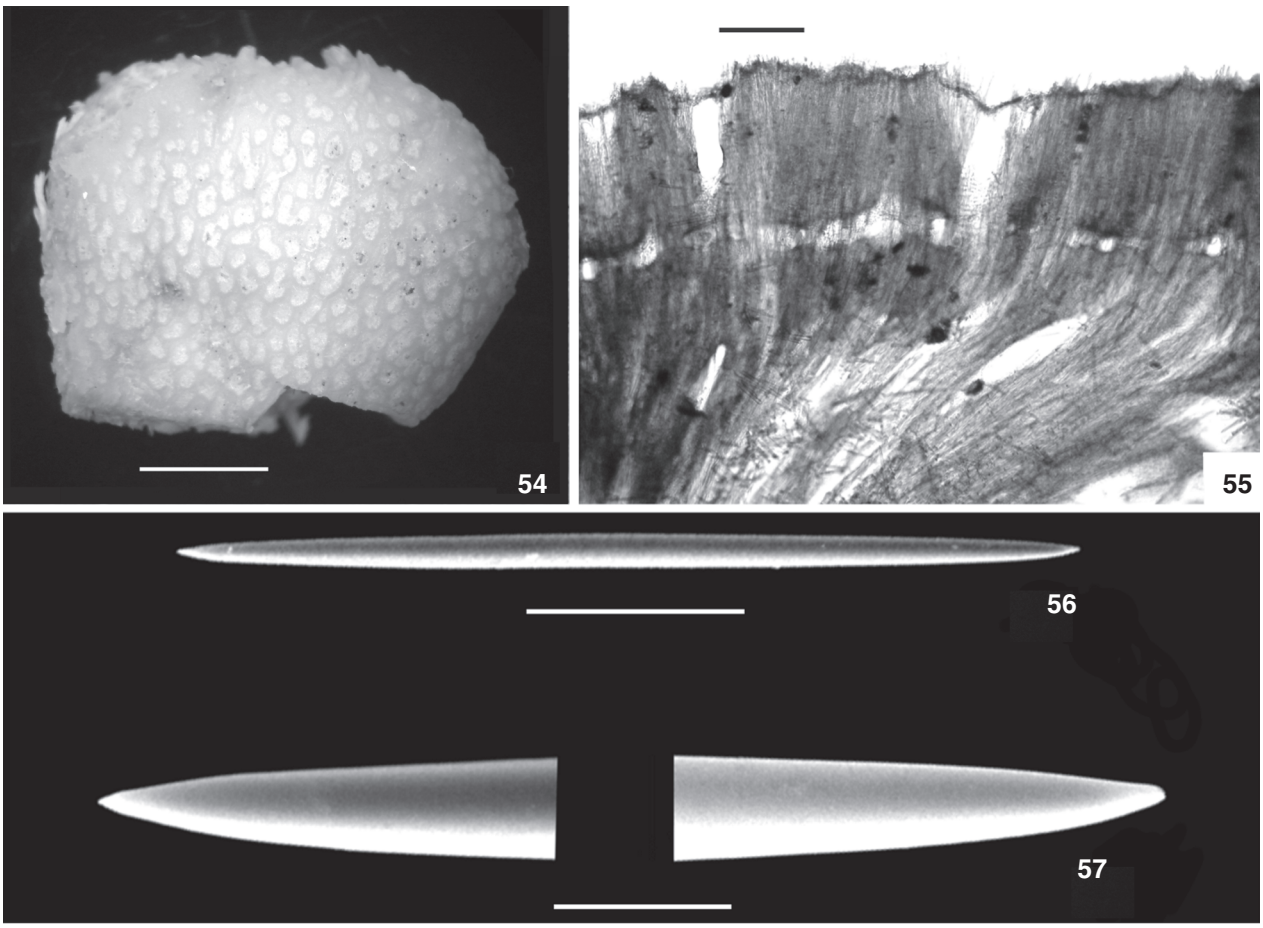
Figures 50-53. *Suberites montiniger*: (50) preserved specimen; (51) skeleton; (52) tylostyle; (53) detail of tylostyle extremities. Scale bars: (50) 1 cm; (51) 300 µm; (52) 100 µm; (53) 10 µm.

extremities varying from acerate to conical, with predominance of the latter form (Fig. 57): 350-*429.2*-480/12.5-*15.6*-17.5 µm.

Remarks. The skeletal architecture and spicules were photographed for the first time, in light microscopy and SEM, respectively.

Topsent (1915) recorded the presence of well-developed papillae; however, in the material studied herein, the surface bears some tiny structures which are not true papillae. Measurements of the oxeas are very similar to those related by Topsent (1915), differing only by the presence of thicker spicules.

Distribution. South America: Falkland Is. (Topsent 1915, Burton 1932, 1934); South Georgia I. (Burton 1934). Antarc-



Figures 54-57. *Halichondria (Eumastia) attenuata*: (54) preserved specimen; (55) skeletal arrangement; (56) oxea; (57) detail of oxea extremities. Scale bars: (54) 0.5 cm; (55) 600 µm; (56) 10 µm; (57) 20 µm.

tica: Bransfield Strait (present study). Bathymetry: 0-2 m (Burton 1932) to 135 m (present study).

Haplosclerida Topsent, 1928
Haplosclerina Topsent, 1928
Chalinidae Gray, 1867
Haliclona (Soestella) chilensis (Thiele, 1905)

Figs 58-62

Reniera chilensis Thiele, 1905: 467, pl. 27, fig. 5, pl. 32, fig. 84.
Haliclona chilensis; Burton, 1932: 265, 1934: 11; Desqueyroux & Moyano, 1987: 50.

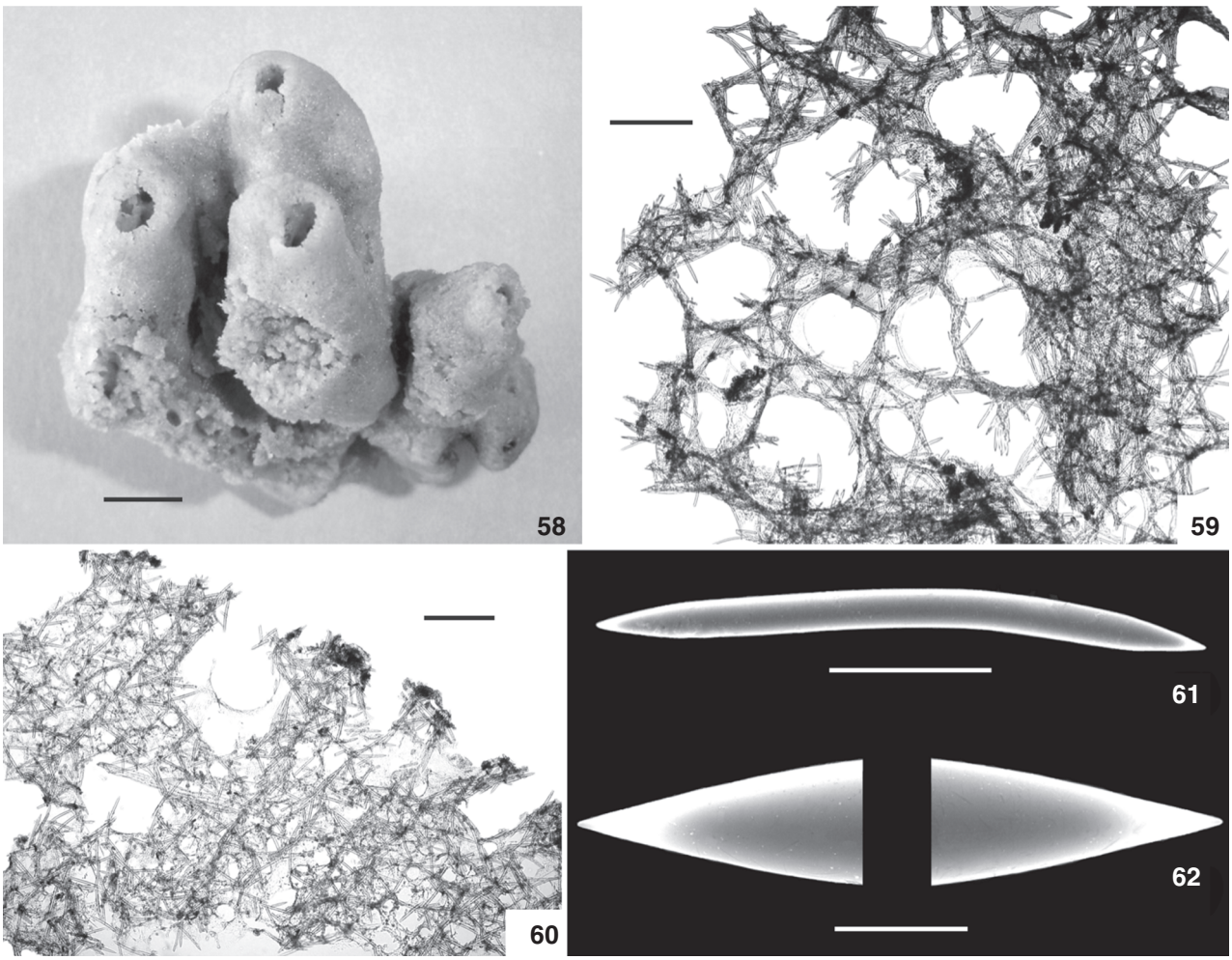
Material studied. MCNPOR 3139, St. C, King George I.: 62º06'S-58º22'W, 28 m, 06.III.1988, PROANTAR VI.

Description. (Fig. 58) Specimen composed of unequal tubular projections bonded by the same base; dimensions: 5.2 x 3.6 cm, 4.0 cm height since the base; tubes ranging from 2.0-3.0 cm height, 1.2-1.8 cm width; surface optically smooth, slightly hispid to the touch; oscular openings at the apex of each tubular projection, 0.25-0.4 cm diameter. Preserved material slightly compressible in consistency; colour brown.

Skeleton. Ectosome formed by a tangential reticulation (Fig. 59), with multispicular rounded meshes, 100-420 µm diameter. Choanosome (Fig. 60) composed by a network of primary ascending tracts, paucispicular (02-05 spicules diameter), 10-50 µm width, connected by secondary tracts, unipaucispicular, 8.0-20 µm width; network bearing irregular meshes, rounded to triangular and/or polygonal, 80-180 µm in diameter. Scarce spongin, more visible at the nodes of the spicule tracts.

Spicules. Megascleres: oxeas – smooth, with a slight central bent, rarely fusiform (Fig. 61), extremities often acerate (Fig. 62), but rounded, conical and hastate forms may also occur: 137.5-*163.9*-180/2.5-*8.9*-12.5 µm.

Remarks. The present sample is quite similar to the original description of Thiele (1905), with tubular projections bear-



Figures 58-62. *Haliclona (Soestella) chilensis*: (58) preserved specimen; (59) tangential view of ectosome; (60) perpendicular section of choanosome; (61) oxea; (62) detail of oxea extremities. Scale bars: (58) 1 cm; (59), (60) 500 µm; (61) 50 µm; (62) 10 µm.

ing an oscular opening at their apex. Together with such characteristics, the inclusion of this species in the subgenus *Soestella* is corroborated by the presence of a tangential ectosome composed by rounded apertures, in addition to possession of a choanosome with subanisotropic network of paucispicular primary lines, irregularly connected by secondary lines, and spongin at the nodes of the reticulation.

Dimensions of oxeas are very similar to those described by Thiele (1905); however, Burton (1932) recorded smaller oxeas. Thiele (*op. cit.*) observed oxeas with blunted ends, but in the present study extremities are more often pointed. These particularities are all interpreted as intraespecific variations.

Distribution. South America: Chile (Thiele 1905, Desqueyroux & Moyano 1987); Falkland Is. (Burton 1932, 1934). Antarctica: South Shetland Is., King George I. (present study). Bathymetry: 15 m (Burton 1934) to 75 m (Burton 1932).

Niphatidae Van Soest, 1980

Hemigellius bidens (Topsent, 1901)

Figs 63-68

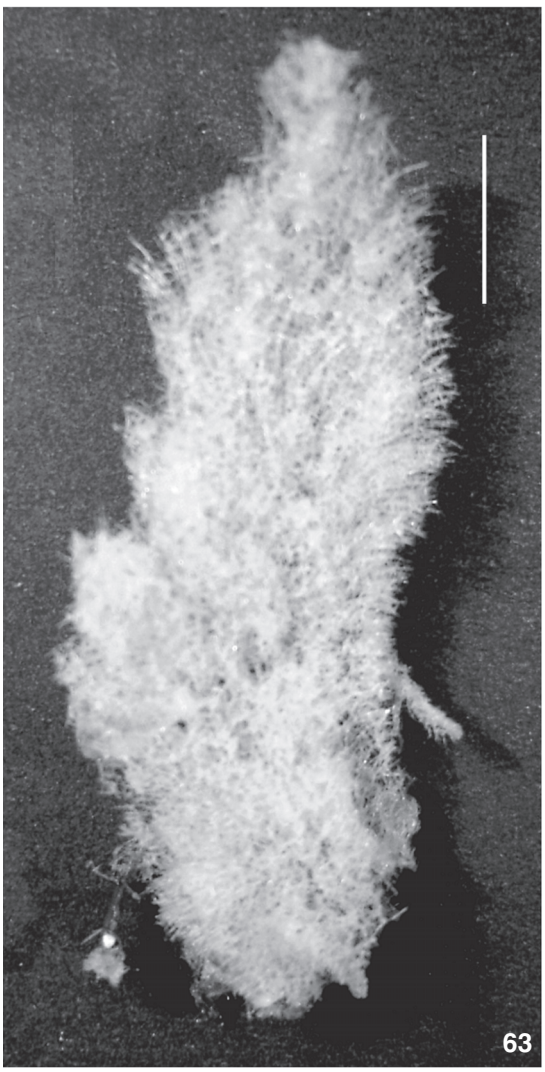
Gellius bidens Topsent, 1901: VII, 1908: 21, pl. I, fig. 1, 1917: 77; Vacelet & Arnaud, 1972: 19; Barthel *et al*., 1990: 123, 1997: 49.

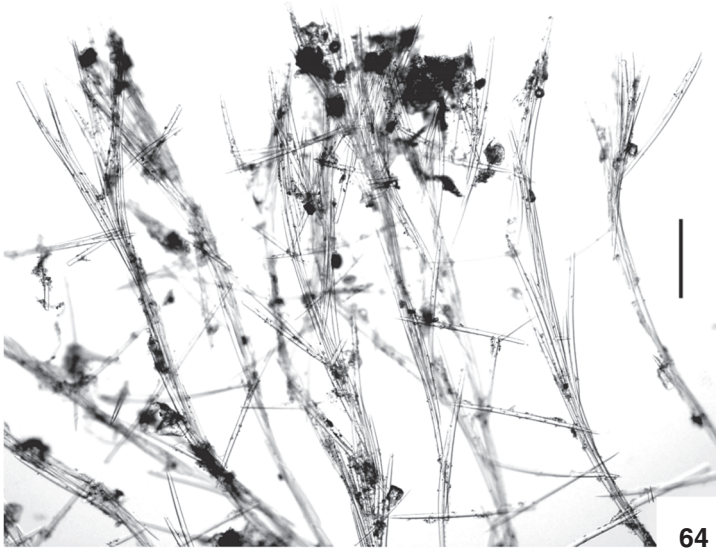
Haliclona bidens; Koltun, 1964: 100.

Further synonym see Koltun (1964).

Material studied. MCNPOR 1981, 1989, St. 4869, Bransfield Strait: 63º33'S-59º15'W, 240 m, 08.II.1986, PROANTAR IV.

Description. (MCNPOR 1989) (Fig. 63) Erect specimen; dimensions, in cm: 4.2 x 1.2, 0.3 thickness. Lightly rugose surface, hispid to the touch. Pores and oscules not observed. Preserved material friable in consistency; colour light brown with





Figures 63-68. *Hemigellius bidens*: (63) preserved specimen; (64) skeleton; (65) oxea; (66) detail of oxea extremities; (67) sigma; (68) detail of sigma extremities. Scale bars: (63) 1 cm; (64) 500 µm; (65) 100 µm; (66), (67) 10 µm; (68) 3 µm.

clearer regions. MCNPOR 1981 is identical to MCNPOR 1989, only differing in having grey colour; dimensions, in cm: 4.0 x 1.3, 0.4 thickness.

Skeleton. (Fig. 64) Ectosome without specialization, with megascleres in confusion. Choanosome with a reticulation composed by paucispicular tracts (02-03 spicules, 38-54 µm thickness), interconnected by 01-02 spicules, forming some isodictyal meshes (180-520 µm in diameter). Nodal spongin present, microscleres irregular or randomly occurring between the tracts.

Spicules. Megascleres: oxeas – smooth, straight or slightly curved (Fig. 65), acerate extremities (Fig. 66): 440-*554.4*-660/ 12.5-*16.3*-18.8 µm (MCNPOR 1981); 480-*610.4*-680/13.8-*20.4*-23.8 µm (MCNPOR 1989). Microscleres: sigmas – smooth (Fig. 67), bearing bifid extremities (Fig. 68): 32.5-*36.8*-40 µm (MCNPOR 1981); 30-*35.1*-40 µm (MCNPOR 1989).

Remarks. Comparison with measurements provided by Topsent (1901) and Koltun (1964), the samples here studied have thicker spicules. For the first time the spicules were photographed by SEM, mainly detailing the extremity of the sigmas, which characterizes the species (Figs 67, 68).

Distribution. Antarctica: Bellinghausen Sea (Topsent 1901); Graham Land (Topsent 1908, 1917); Victoria Land (Burton 1929, 1938); Wilhelm II Land (Hentschel 1914); Adelie Land (Vacelet & Arnaud 1972); Weddell Sea (Barthel *et al*. 1990, 1997); Bransfield Strait (present study). Bathymetry: 30 m (Topsent 1908) to 550 m (Topsent 1901).

Petrosina Boury-Esnault & Van Beveren, 1982
Phloeodictyidae Carter, 1882
Calyx arcuarius (Topsent, 1913)
Figs 69-74, Tab. IV

Gellius arcuarius Topsent, 1913: 638, pl. VI, fig. 11.

Calyx arcuarius; Burton, 1938: 9; Koltun, 1976: 196; Desqueyroux, 1975: 71, pl. IV, figs 53-54; Barthel *et al*., 1990: 123, 1997: 49; Sarà *et al*., 1990: 254; Gutt & Koltun, 1995: 231; Cattaneo-Vietti *et al*., 1999: 540.

Further synonym see Desqueyroux (1975).

Material studied. MCNPOR 3135, St. C, Livingston I.: 62º40'S-59º33'W, 270 m, 08.III.1987, PROANTAR V; MCNPOR 1964, St. 4871, Bransfield Strait: 63º16'S-59º55'W, 264 m, 08.II.1986, PROANTAR IV; MCNPOR 1954, St. 4875, Bransfield Strait: 63º17'S-62º30'W, 157 m, 14.II.1986, PROANTAR IV.

Description. (MCNPOR 1954) (Fig. 69) Fan-shaped sponge; dimensions, in cm: 27.5 height, 17.8 width, 0.5 thickness; optically smooth surface, on magnifying glass small spicule tract projections were observed; oscules present in both sides of the sponge, however more concentrated in basal region, in discrete stiffly volcanic projections, never exceeding 0.1 cm in diameter. Preserved material elastic and compressible in consistency; colour beige with greyish regions. MCNPOR 1964 and 3135 present the same form, texture and colour than MCNPOR 1954; however the oscules were only observed in one of the sides of the surface; dimensions, in cm: 15.5 height, 6.5 width, 0.6 thickness, and 11 height, 6.5 width, 0.4 thickness, respectively.

Skeleton. Ectosome with a dense tangential reticulation, which are forming triangular to polygonal meshes (Fig. 70), 80-170 µm in diameter, unispicular tracts with nodal spongin. Choanosome formed by longitudinal multispicular tracts (Fig. 71), 75-140 µm thickness, which are interconnected by unispicular tracts bearing the same ectosomal features, only differing in having a more dense reticulation; toxas occurring around the tracts.

Spicules. Megascleres: oxeas – smooth, slightly curved and swollen (Fig. 72); acerate extremities (Fig. 73) (190-*215.4*-294.5/ 11.5-*18*-23 µm). Microscleres: toxas (Fig. 74) – smooth, of varied opening angles, with sharp-pointed extremities (69-*121.4*-181.7/ 1.2-*3.7*-6.9 µm). All measurements are given in table IV.

Table IV. *Calyx arcuarius*: spicules measurements (µm).

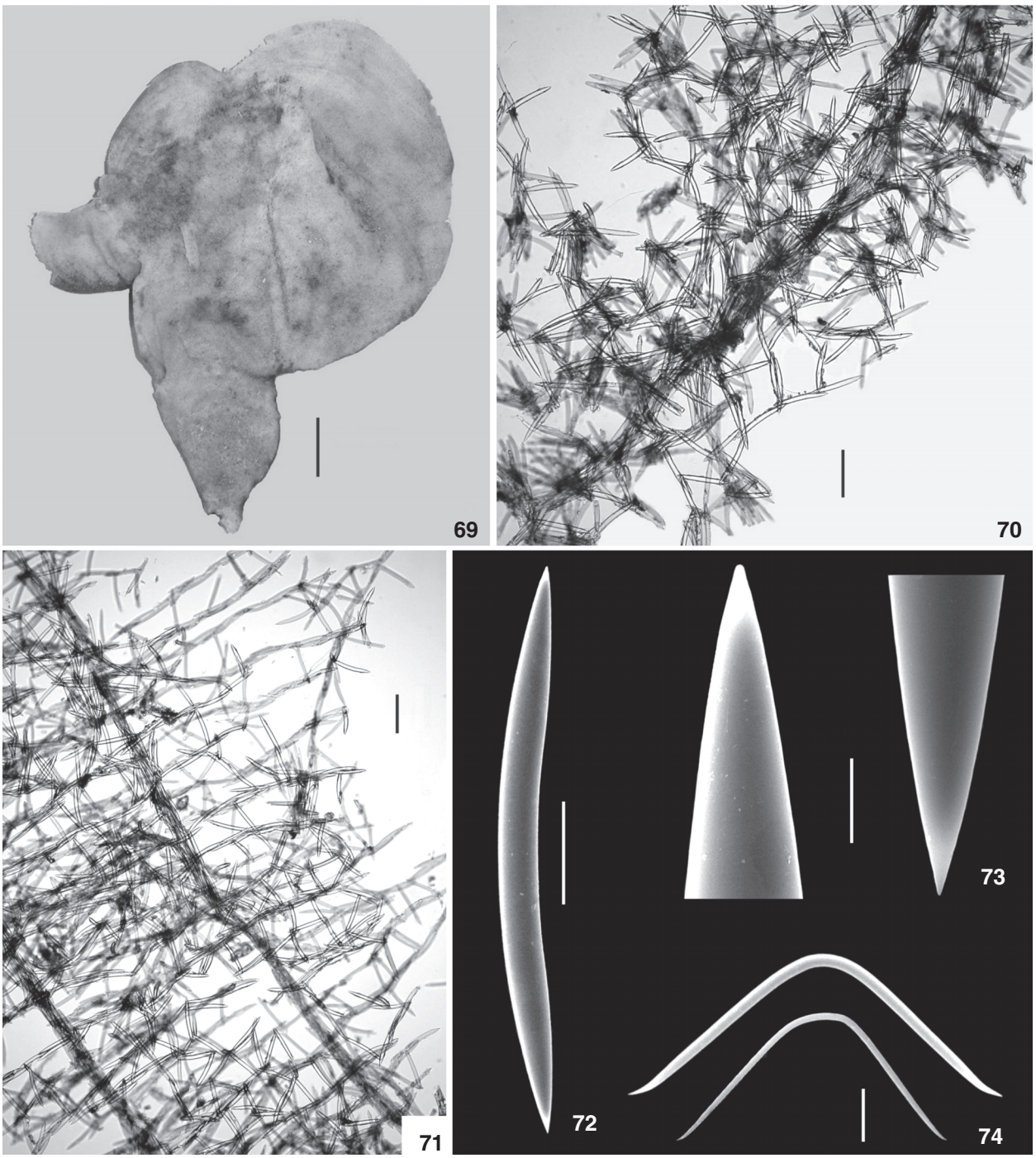
MCNPOR	Oxeas	Toxas
1954	190-216.2-237.5/ 16.1-19.4-23	78.2-115.2-147.2/ 1.2-4.0-6.9
1964	209-205-294.5/ 11.5-17.2-19.6	69-119.1-181.7/ 1.2-3.2-4.6
3135	190-225-256.5/ 11.5-18.4-20.7	80.5-129.8-174.8/ 1.2-3.7-5.8

Remarks. Another conspicuous sponge in Antarctic waters; the list of synonyms includes *C. stipitatus* Topsent, 1916, which does not bear toxas; Burton (1932), in comparing samples from both groups, observed that some features presented a subtle variation, in regard to spicules, external morphology and skeleton, and pointed out that such absence does not have taxonomic value.

Distribution. South America: South Georgia I.; Shag Rocks (Burton 1932, 1934). Antarctica: South Orkneys Is. (Topsent 1913); Graham Land (Topsent 1916, 1917); Victoria Land (Burton 1929, Sarà *et al*. 1990, Cattaneo-Vietti *et al*. 1999); Queen Mary Land (Burton 1938); Knox Land; Banzare Land; Wilhelm II Land; McRobertson Land; Adelie Land (Koltun 1964); Enderby Land; Princess Elisabeth Land (Koltun 1976); Weddell Sea (Barthel *et al*. 1990 1997 Gutt & Koltun 1995); South Shetland Is.: Deception I. (Desqueyroux 1975); Livingston I. (present study); King George I. (Koltun 1964); Bransfield Strait (present study). Bathymetry: 18 m (Burton 1929) to 900 m (Koltun 1964).

DISCUSSION

Out of the 11 species described here, two are new records for Antarctica: *Halichondria (Eumastia) attenuata* and *Haliclona (Soestella) chilensis*. Both were formerly known only from the southernmost tip of South America, and their distribution is now



Figures 69-74. *Calyx arcuarius*: (69) preserved specimen; (70) tangential view of ectosome; (71) longitudinal section of choanosome; (72) oxea; (73) detail of oxea extremities; (74) toxas. Scale bars: (69) 3 cm; (70), (71) 300 µm; (72) 50 µm; (73) 10 µm; (74) 20 µm.

extended to the South Shetland Islands and vicinity. The species studied generally occur off the coasts of Chile and Argentina, the Falkland Islands, Magellan Strait and Kerguelen Island; this study corroborated the affinities of this sponge fauna with areas of the southern coasts of Chile and Argentina, the Magellan Strait and some islands of the Scotia Arc (South Georgia, South Orkneys

and South Sandwich Islands). The continuity of the Antarctic fauna in this region is explained by the existing geological connection between the continents (Barnes 2005).

Knowledge of the local benthic diversity in the South Shetland Is. and vicinities was expanded by the records of *Tethyopsis longispinum*, *Suberites montiniger* and *Hemigellius bidens*. *Tethyopsis longispinum* and H*alichondria (Eumastia) attenuata* also showed new bathymetric limits.

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