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New records of deep-water Scleractinia off Argentina and the Falkland Islands

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Abstract

The twenty species of Scleractinia (all azooxanthellate) known to occur off Argentina and the Falkland Islands (the Atlantic component of the cold temperate Magellan Province) are discussed, 15 of which are documented by new records. Five new species are described: *Caryophyllia kellerae, C. coronula*, *Solenosmilia australis*, *Flabellum cinctutum*, and *Javania cristata*. Five geographic and nine bathymetric range extensions are also documented. A brief history of species discovery in this region is given, and a key to the species is provided.

Key words: Scleractinia, azooxanthellate coral, new species, zoogeography, Patagonia, Argentina, Falkland Islands, Magellan Province

Introduction

Although the history of the study of Argentinean azooxanthellate Scleractinia was largely tabularized by Cairns (1982: Table 1) as part of his review of the Antarctic and Subantarctic Scleractinia, some of the highlights and updates are presented here. The first species reported from this region was *Flabellum thouarsii* Milne Edwards & Haime, 1848 from the Falkland Islands. It was not for another 30 years (Studer 1878) that another specimen of the same species was reported from off Argentina proper, from relatively shallow water off Cabo Blanco. Moseley (1881), in his account of the deep-water Scleractinia collected by the *Challenger* expedition, reported three new species from one station (*Challenger* 320: 37°17'S, 53°52'W, 1097 m) from the northern border of the cold temperate Argentinean region: *Flabellum curvatum, Bathelia candida*, and *Crispatotrochus cornu*. After a long hiatus, Gardiner (1939) reported several species from the Falkland Islands, Burdwood Bank, and the Argentinean coast that were collected from the RSS *William Scoresby.* Most of his specimens subsequently re-identified by Cairns (1982).

In the first paper of the modern age of scleractinian taxonomy (Cairns 2001), Squires (1961), based on specimens collected by the R/V *Vema*, reported two new species from the southern cold temperate region of Argentina (*Sphenotrochus gardineri* and *Balanophyllia malouinensis*), reviewed the species known from this region, and discussed their zoogeography. Later, as part of the Antarctic Map Folio Series, Squires (1969) discussed and mapped the distribution of all scleractinian species known from the Antarctic and Subantarctic regions, reiterating much of what had been published in 1961. Furthermore, Keller (1974) reported additional specimens of *F. thouarsii* from off Tierra del Fuego.

Cairns (1979) designated and illustrated the lectotype of *Crispatotrochus cornu* (Moseley, 1881). Later, in the context of a revision of the Antarctic and Subantarctic Scleractinia, he (Cairns 1982) described and illustrated all species then known from the Subantarctic portion of Argentina, reporting Argentinean specimens collected by the research vessels: USNS *Eltanin,* ARA *Islas Orcadas,* R/V *Hero,* R/V *Vema,* R/V *Walther Herwig,* and *Calypso*. Later, in a field guide to the Antarctic Scleractinia, Cairns (1990) diagnosed, keyed, and illustrated the Antarctic species, including some that also occur in Subantarctic Argentina. Finally, Kitahara and Cairns (2005) described *Monohedotrochus capitolii*, known primarily from warm temperate Brazilian waters, but including one record from off central Argentina.

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Material and methods

Most of the specimens reported herein were collected by the *B/O Miguel Oliver* on nine expeditions made in 2008, 2009, and 2010 (see Station List) by the Instituto Español de Oceanografía. The expeditions were carried out to evaluate fisheries stocks and identify potential vulnerable marine ecosystems in the study area. The expeditions were classified as two types: Atlantis (ATL), which were made with Lofoten trawls methods in soft substrate, and the Patagonian series (PAT), which were made with a rock dredge on a hard substrate. All of the expeditions were conducted in the austral summer months. These specimens are deposited primarily at the MNCN, but also with a voucher collection at the NMNH, and some paratypes at the MNHN. At the time of publication, some of the paratypes and all of the non-types indicated to have been deposited at the MNCN still reside at the Instituto Español de Oceanografía, Centro Oceanográfico de Gijón, and have remianed uncataloged. These specimens will be transferred at a later date. Additionally, some specimens are also reported from the R/V *Walther Herwig* (4 stations), R/V *Vema* (2 station), and USNS *Eltanin* (1 station) expeditions.

The Falkland Islands and Burdwood Bank are included in the range of this paper, as these two regions complete the Atlantic component of the cold temperate Magellan Province (sensu Briggs 1974), the continental slope (and deep-water fauna) of Argentina being continuous with that of the Falkland Islands.

Morphological terminology used in the key and species descriptions is defined and illustrated in Cairns & Kitahara (2012). Narrative (non-telegraphic) text is used in the species descriptions to improve the accuracy and flow of the text. Stations listed in the Material examined sections are arranged chronologically and indicates the museum of deposition.

The following abbreviations are used in the text:

Cx, Px, Sx: Costal, palar, or septal cycle designated by the numerical subscript
CD: Calicular diameter
GCD: Greater calicular diameter
GCD:LCD: Ratio of greater to lesser calicular diameters
LCD: Lesser calicular diameter
MNCN: Museo Nacional de Ciencias Naturales de Madrid
MNHN: Muséum national d'Histoire naturelle, Paris
NMNH: National Museum of Natural History, Smithsonian, Washington DC
PD: Pedicel diameter
PD:GCD: Ratio of pedicel diameter to greater calicular diameter
USNM: United States National Museum (now the NMNH)
WH: R/V *Walther Herwig*
ZMB: Zoologisches Museum, Berlin

Zoogeography

The entire coast of Argentina, from Rio de la Plata to the Drake Passage just south of Tierra del Fuego at the Antarctic Convergence (as well as the southern coast of Chile to the northern coast of Isla Grande de Chiloé, about 42°S), is considered by Briggs (1974) to be the cold temperate Magellan Province. Its Atlantic northern border with the warm temperate region, the Rio de la Plata estuary, is the border of the confluence and eastern deflection of the northward flowing Falkland Current and the warmer southward flowing Brazil Current. The southern border is the Antarctic Convergence. This province is subdivided by some (e.g., Menzies 1962, Hedgpeth 1969) into two regions, a northern portion north of about 45°S, and a colder region south of 45°S (latitude of the Subtropical Convergence), the latter sometimes called the Subantarctic region (e.g., Hedgpeth 1969, Cairns 1982). In slight variance, Spalding *et al*. (2007) consider the warm temperate province to extend more southward, to Punta Rasa (about 41°S), south of which they place the Patagonian Shelf ecoregion of the cold temperate Magellan Province. Most of the new records reported herein were collected in this ecoregion. Although these regions were defined by the distribution patterns of shelf fauna, according to Briggs (1974: 366) they are fairly accurate delineators for upper slope fauna (200–1000 m) as well, which is the primary range of the Scleractinia reported herein.

Of the twenty scleractinian species known from off Argentina and the Falkland Islands (Table 1), two are cosmopolitan in distribution (*F. marenzelleri* and *D. dianthus*) and one is circum-Subantarctic (*F. apertum*), and thus these species do not contribute to zoogeographic patterns. Of the remaining 17 species, two (*C. antarctica* and *J. antarctica*) are predominantly high Antarctic in distribution, with a northern extension into the cold temperate region (43–45°S), reported herein for the first time. This transgression across the Antarctic/Cold Temperate boundary may be facilitated by the northern flowing Antarctic Bottom Water that sweeps along the eastern continental slopes of South America. Of the remaining 15 species, 13 are endemic to the cold temperate waters of Argentina. This is consistent with Briggs' (1974:366) statement that the cold temperate upper slope Argentinean fauna is "highly distinctive with very few species that also range to the tropics". Eight species (*F. thouarsii*, *F. curvatum*, *F. areum*, *F. squiresi*, *F. cinctutum*, *J. cristata*, *S. australis*, and *C. coronula*) are found in both the southern and northern portions of this region, of which the first three listed are found throughout the cold temperate region, essentially defining the Atlantic portion of the Magellan Province. Furthermore, *Solenosmilia australis* is found off both cold temperate Argentina and Chile. Four more of the 13 cold temperate species occur only in the "polar" or southern Subantarctic portion of the province (*C. kellerae*, *S. gardineri*, *T. truncum*, and *B. malouinensis*), and the remaining cold temperate species (*C. cornu*) is confined to the warmer northern region of the Magellan Province. But, contrary to Briggs' statement cited above, two species have distributions in both the cold temperate region and the warm temperate region to the north (the eastern South American region): *B. candida* occurs throughout the cold temperate region as well as off cold temperate Chile and extends to 32°S in the Atlantic, whereas *M. capitolii* occurs in the northern cold temperate region and north to 28°S. Again, these northward extensions may be due to the northern flowing Antarctic Bottom Water.

TABLE 1. Scleractinia known from off Argentina (*additional or new records for Argentina reported herein).

Fungiacyathidae
Fungiacyathus marenzelleri (Vaughan, 1906)
Oculinidae
**Bathelia candida* Moseley, 1881
Caryophylliidae
**Caryophyllia antarctica* Marenzeller, 1904
**C. squiresi* Cairns, 1982
C. kellerae*, **n. sp.
C. coronula*, **n. sp.
**Crispatotrochus cornu* (Moseley, 1881)
**Monohedotrochus capitolii* Kitahara & Cairns, 2005
**Desmophyllum dianthus* (Esper, 1794)
Solenosmilia australis*, **n. sp.
Turbinoliidae
Sphenotrochus gardineri Squires, 1961
Flabellidae
**Flabellum curvatum* Moseley, 1881
**F. thouarsii* Milne Edwards & Haime, 1848
**F. areum* Cairns, 1982
F. apertum Moseley, 1876
Flabellum cinctutum*, **n. sp.
Truncatoflabellum truncum (Cairns, 1982)
**Javania antarctica* (Gravier, 1914)
Javania cristata*, **n. sp.
Dendrophylliidae
Balanophyllia malouinensis Squires, 1961

Geographic range extensions are reported for five of the 15 previously described species, the most significant being the extension of *C. antarctica* and *F. antarctica* from the Antarctic to the cold temperate province. Bathymetric range extensions are also reported for nine of the 15 previously described species (see Distribution sections). In addition to the new species, two species are new records for Argentina: *Caryophyllia antarctica* and *Javania antarctica*.

Systematics

Key to the Scleractinia known from off Argentina

1a	Corallum solitary	2
1b	Corallum colonia	19
2a	Corallum having a pedicel and basal disc, usually firmly attached to the substrate, if only to a small pebble	3
2b	Corallum lacking a pedicel (completely unattached)	18
3a	Columella prominent (fascicular, papillose or spongy)	4
3b	Columella absent, or inconspicuously present only as a fusion of lower axial edges of larger septa	10
4a	Columella spongy; theca and septa porous, although theca sometimes partially covered with a smooth epitheca	***Balanophyllia malouinensis***
4b	Columella fascicular or papillose; theca and septa solid, the theca usually costate	5
5a	Columella papillose; P1–2 (paliform lobes) indistinguishable from columella	***Monohedotrochus capitolii***
5b	Columella fascicular; P3 (pali) either absent or present as a well-defined crown	6
6a	Pali lacking	***Crispatotrochus cornu***
6b	Pali (P3) present as a well-defined crown (*Caryophyllia*)	7
7a	Width of S4 less than that of S3	8
7b	Width of S4 equal to or greater than that of S3	***Caryophyllia kellerae***
8a	Septal edges mildly sinuous or straight; septal faces lack oblique ridges	9
8b	Septal edges extremely sinuous; septal faces of S1–3 bear oblique ridges	***Caryophyllia antarctica***
9a	Theca thin (translucent), and smooth; septa non-exsert	***Caryophyllia squiresi***
9b	Theca thick (opaque), and costate; septa slightly exsert	***Caryophyllia coronula***
10a	Theca longitudinally costate (and granular)	***Desmophyllum dianthus***
10b	Theca smooth (porcellaneous), costae lacking but C1–2 may be ridged near calice	11
11a	Corallum propagates by transverse division, resulting in an elliptical scar at base of anthocyathus	***Truncatoflabellum truncum***
11b	Corallum not a result of transverse division, having no basal scar (often attached)	12
12a	Pedicel thickened with concentric layers of dense stereome; corallum firmly attached (*Javania*)	13
12b	Pedicel not thickened, the original basal disc of 6 or 12 septa often plainly seen; corallum often detached from substrate (*Flabellum*)	14
13a	Corallum with five cycles of septa (96); theca smooth; septa not exsert	***Javania antarctica***
13b	Corallum with only four cycles of septa (48); C1–3 prominently ridged near calice; septa slightly exsert	***Javania cristata***
14a	Corallum delicate (thin theca and septa), often scolecoid in shape due to regeneration; theca covered with numerous fine horizontal granular ridges	***Flabellum cinctutum***
14b	Corallum more robust, straight or regularly curved; theca lack horizontal ridges	15
15a	Lower pedicel (basal disk) diameter 3.5–5.0 mm	***Flabellum areum***
15b	Lower pedicel (basal disk) diameter 2–3 mm	16
16a	Corallum campanulate; pedicel rudimentary, usually worn (and thus unattached)	***Flabellum apertum***
16b	Corallum compressed-conical (ceratoid to trochoid); pedicel well developed (although usually unattached as well)	17
17a	Pedicel short (about 3.5 mm) and straight; corallum straight; septal notches lack fine serration	***Flabellum thouarsii***
17b	Pedicel longer (up to 10 mm) and usually bent; corallum usually curved; septal notches bear a fine serration	***Flabellum curvatum***
18a	Corallum campanulate, large (up to 57 mm GCD); pedicel worn and thus free	***Flabellum apertum***
18b	Corallum discoidal, up to 40 mm CD; pedicel absent	***Fungiacyathus marenzelleri***
18c	Corallum cuneiform (wedge-shaped), and small (GDC only up to 9 mm); pedicel absent	***Sphenotrochus gardineri***
19a	Budding exclusively distomadeal intratentacular; columella rudimentary fascicular; paliform lobes lacking	***Solenosmilia australis***
19b	Budding predominantly sympodial extratentacular; papillose columella robust; paliform lobes (P3) usually present	***Bathelia candida***

Family Oculinidae

Bathelia candida Moseley, 1881

Figs. 1B, 2A–C, 5

Bathelia candida Moseley, 1881: 177–178, pl. 8, figs. 1–6.—Cairns, 1982: 13, pl. 3, figs. 1–3, Map 1 (re-description and illustrations).—Kitahara & Cairns, 2005: fig. 2E.—Kitahara, 2007: 500, 501 (listed).—Kitahara *et al*., 2009: 228 (listed).

Remarks. The species was well described by Cairns (1982). The uncommon asexual reproduction mode of distomadeal intratentacular budding, alluded to by Cairns (1982), is illustrated herein (Fig. 2A). Septa of the four cycles are virtually indistinguishable in size, all being uniformly narrow with finely dentate axial edges, although the S1–2 are sometimes slightly exsert, conferring a symmetry to the calice. The paliform lobes (incorrectly called pali by Cairns 1982) are tall slender ribbons sometimes occurring two to a septum, but often missing from all or some of the septa within a calice. The paliform lobes (P3) are indistinguishable from the centrally placed columellar elements, altogether forming a robust axial structure.

The normally extratentacular (sympodial) budding of this species is usually sufficient to distinguish it from the only other colonial scleractinian known from this region, *Solenosmilia australis*, which has consistently distomadeal intratentacular budding. But, on rare occasions, *B. candida* is known to have this type of budding as well (Fig. 2A). In that case, *B. candida* can be distinguished by its large columella, paliform lobes (P3), and finely dentate septal axial edges.

Dead coralla of this species form the substrate for at least six species of solitary Scleractinia and many other encrusting organisms (see Material). The species occurs in such local abundance (Fig. 1A) that it must be considered to be a framework-forming (or constructional) azooxanthellate species, along with 18 other species discussed by Roberts *et al.* (2009: Table 2.3). The tissue of the living coral is pale orange.

Distribution. Southernmost Brazil (off Rio Grande), entire coast of Argentina to latitude of Bahía Desvelos, and off Peninsula de Taito, Chile (Fig. 5), 500–1626 m. Previously known only from the holotype and nine additional records (Cairns 1982), the numerous specimens reported herein add many records of this species from off Argentina, and slightly increase its deepest known depth range from 1250 to 1626 m. *B. candida* is one of the few species to occur in cold temperate as well as the southern warm temperate region of the western Atlantic. It is also noteworthy in occurring on both sides of Patagonia.

Material: PAT0108DR1, 10, MNCN; PAT0108DR2, 10, MNCN; PAT0108DR7, 10, MNCN; PAT0108DR8, 1, MNCN; PAT0108DR11, 5, MNCN, and as dead substrate for *M. capitolii*, USNM ; PAT0108DR12, 10, MNCN; PAT0108DR15, 5, MNCN, and as dead substrate for *F. cinctutum*, USNM 1193314; PAT1008DR1, 3, MNCN; PAT1008DR4, 5, MNCN; PAT1008DR5, 5, MNCN, and 1 calice, USNM 1193268; PAT1008DR6, 3, MNCN; PAT1008DR9, 2, MNCN; PAT1008DR10, 1, MNCN; PAT1008DR13, 5, MNCN; PAT1008BC24, 1 as dead substrate for *Javania cristata*, USNM 1193330; PAT1108DR3, 3, MNCN; PAT1108DR4, 5, MNCN and 1 colony, USNM 1193271; PAT1108DR8, 2, MNCN; PAT1108DR9, 10, MNCN; PAT1108DR11, 3, MNCN; PAT1208DR4, 5, MNCN; PAT1208DR5, 5, MNCN; PAT 1208DR6, 5, MNCN; PAT1208DR7, 5, MNCN; PAT1208DR9, 4, MNCN; PAT1208DR10, 5, MNCN; PAT1208DR11, 5, MNCN; PAT1208DR14, 3, MNCN; PAT1208DR16, 5, MNCN; PAT0209DR1, 5, MNCN; PAT0209DR2, 3, MNCN; PAT0209DR3, 5, MNCN; PAT0209DR4, 5, MNCN; PAT0209DR5, 5, MNCN; PAT0209DR7, 5, MNCN; PAT0209DR8, 7, MNCN; PAT0209DR9, 4, MNCN; PAT0209DR10, 3, MNCN; PAT0209DR11, 3, MNCN and as dead substrate for *D. dianthus*, USNM 1192949; PAT0209DR12, 5, MNCN; PAT0209DR14, 5, MNCN and as dead substrate for *C. cornu*, USNM1193289; PAT0209DR15, 5, MNCN; PAT0209DR16, dead substrate for *C. cornu*, USNM 1193291; PAT0210DR5, 15, MNCN; PAT0210DR6, 10, MNCN; PAT0210DR7, 23, MNCN; PAT0210DR8, 10, MNCN; PAT0210DR9, 5, MNCN; PAT0210DR10, 1 colony, USNM 1193269; PAT0210DR11, 2, MNCN, and 2 branches, USNM 1193270; ATL08Lo17, 1, MNCN; ATL08Lo104, 10, MNCN; ATL09Lo8, 2, MNCN; ATL0310Lo32, 5, MNCN; ATL0310Lo94, 5, MNCN; *WH* 328/71, dead substrate for paratype of *M. capitolii*, USNM 83381.

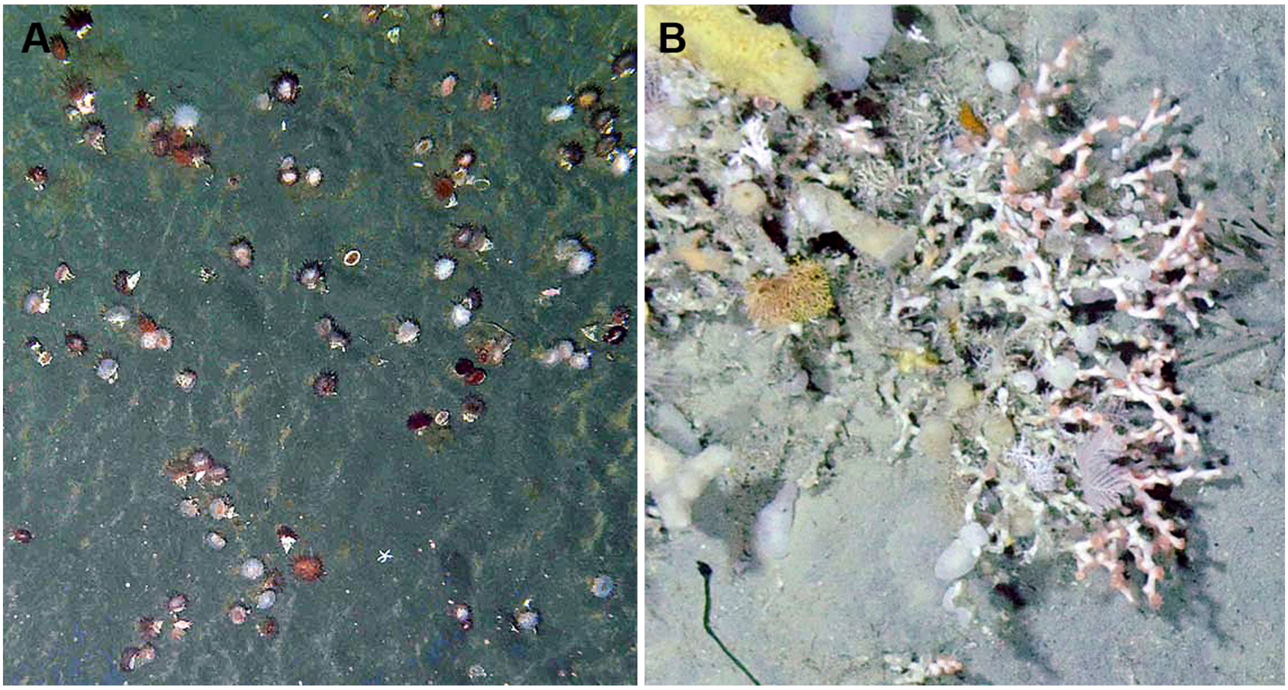

FIGURE 1. A, *Flabellum curvatum*, *in situ*,46°21.2253'S, 59°19.6271'W, 200 m; B, *Bathelia candida*, *in situ*, 46°16.5152'S, 60°41.4169'W, 130 m.

Family Caryophylliidae

Caryophyllia antarctica Marenzeller, 1904
Figs. 2D–E, 6

Caryophyllia antarctica Marenzeller, 1904: 293–294, pl. 16, figs. 7, 7d.—Squires, 1969: 16, 17, pl. 6, map 1.—Cairns, 1982: 15–16, pl. 3, figs. 7–9, pl. 4, figs. 1–4, map 3 (re-description, complete synonymy); 1990: 33–34, figs. 8–9.—Kitahara, Cairns & Miller, 2010: 114 (key).

Remarks. This species is relatively well known, and was re-described from abundant material by Cairns (1982, 1990). Despite its location, the specimens reported herein are entirely consistent with the known species. They have four complete cycles of septa, the inner edges of their S3 and P3 being quite sinuous, each of these elements having oblique rows or ridges of rectangular-shaped granules on their faces. The fossa is quite shallow and the columella is well developed.

Distribution. The distribution of *C. antarctica* was stated to be exclusively Antarctic, with the northernmost records being at South Georgia and Bouvet Island (Cairns 1982), and thus these records are range extensions into the cold temperate region as far north as 43°17'S (Fig. 6), as well as increasing its bathymetric range from 87–1435 to 87–1620 m. Squires (1969) reported this species from the Subantarctic regions of southern Chile and off the Falkland Islands, but Cairns (1982) dismissed these records as they could not be confirmed by specimen data. The Argentinean records cause one to reconsider if Squires may have been correct about the Subantarctic distribution.

Material. PAT1108DR5, 15, MNCN; PAT1208DR4, 1, MNCN; PAT0209DR1, 2, MNCN; PAT0209DR4, 1, USNM 1193272; PAT0209DR7, 1, MNCN; PAT0209DR8, 1, MNCN; PAT0209DR15, 2, MNCN.

Caryophyllia squiresi Cairns, 1982
Figs. 2F–G, 7

Caryophyllia squiresi Cairns, 1982: 16, pl. 4, figs. 5–9, map 3.—Cairns *et al*., 2005: 33.—Kitahara, Cairns & Miller, 2010: 113 (key).

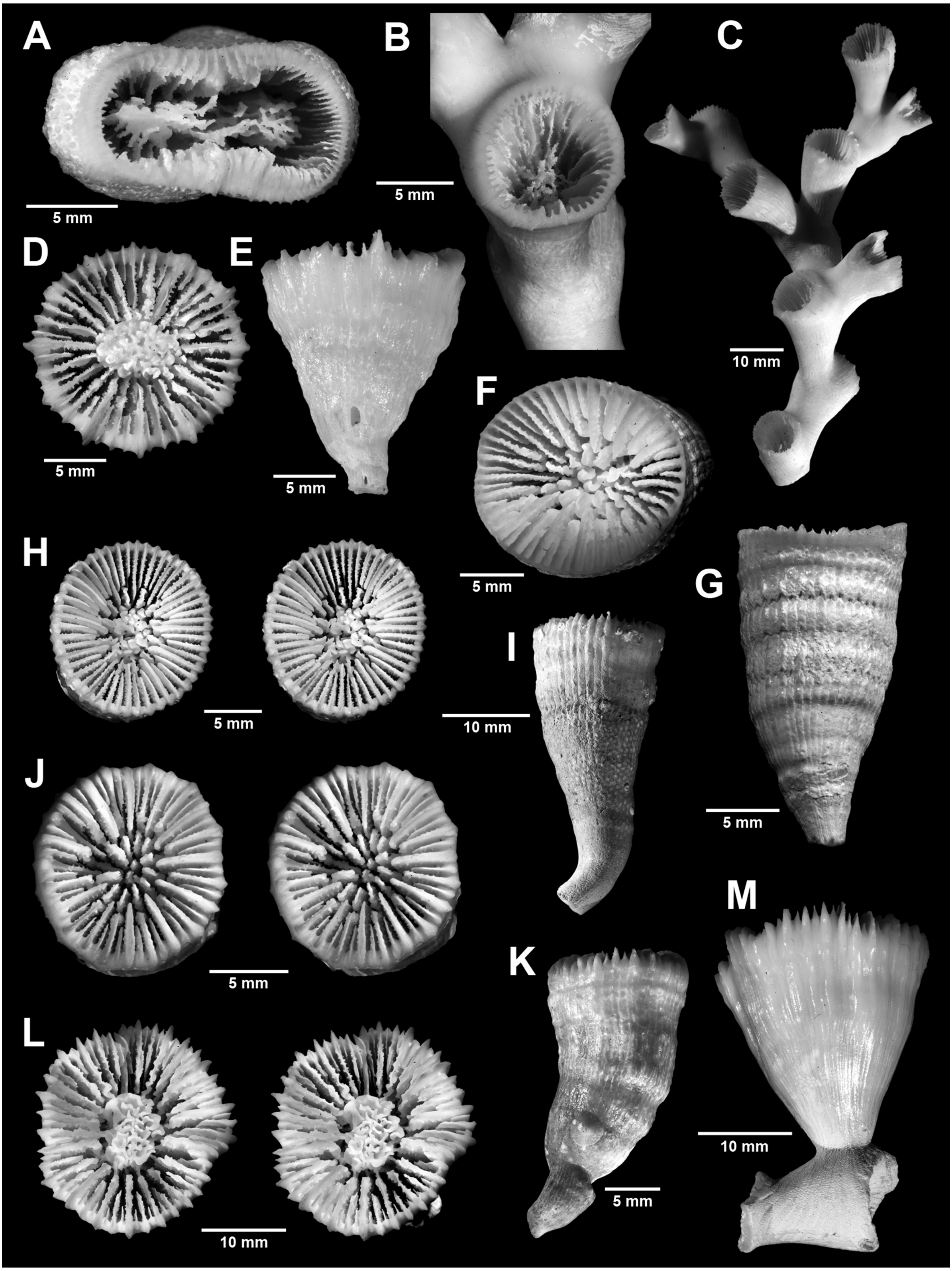

FIGURE 2. A–C, *Bathelia candida*: A, PAT1008DR5, rarely observed case of intratentacular budding; B–C, PAT0210DR10, a calice and branch fragment, respectively. D–E, *Caryophyllia antarctica*, PAT0209DR4, calicular and lateral views of corallum. F–G, *C. squiresi*, PAT1208DR6, calicular and lateral views of corallum. H–I, *C. kellerae*, holotype, stereo calicular and lateral views of corallum. J–K, *C. coronula*, holotype, stereo calicular and lateral views of corallum. L–M, *Crispatotrochus cornu*, PAT0209DR14, stereo calicular and lateral views of corallum.

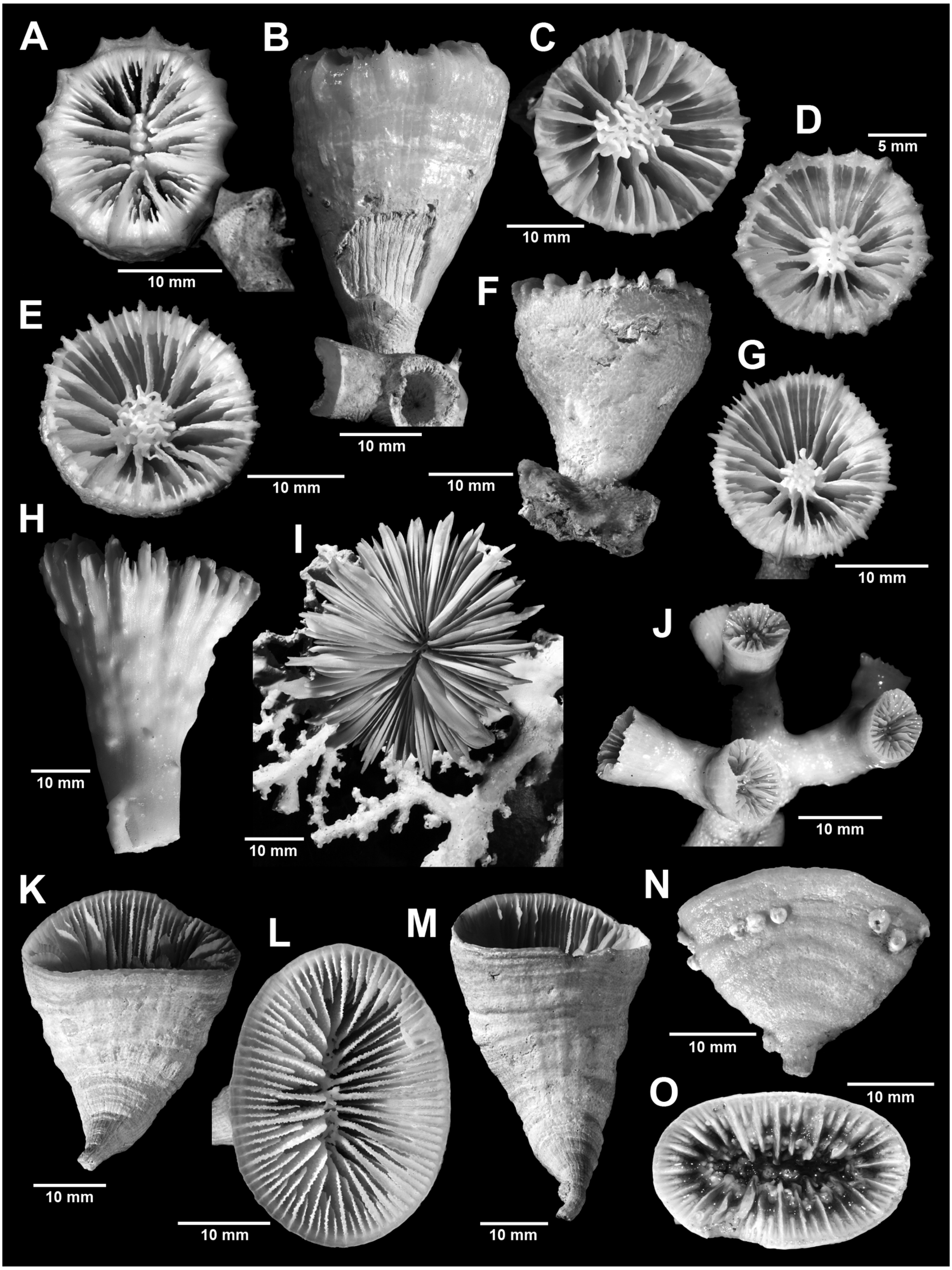

FIGURE 3. A–B, *Crispatotrochus cornu*, PAT0209DR16, calicular and lateral views of corallum. C–G, *Monohedotrochus capitolii*: C, PAT1008DR8, calicular view; D, PAT0209DR11, calicular view; E–F, PAT1008DR3, calicular and lateral views of corallum; G, PAT0108DR11, calicular view. H–I, *Desmophyllum dianthus*: H, PAT0108DR11, lateral view of corallum; I, PAT1008DR4, calicular view of corallum attached to a stylasterid. J, *Solenosmilia australis*, holotype. K–M, *Flabellum curvatum*: K–L, ATL09Lo66, lateral and calicular views of corallum; M, ATL10Lo89, lateral view of straight corallum. N–O, *F. thouarsii*, ATL10Lo89, lateral and calicular views of corallum with tissue.

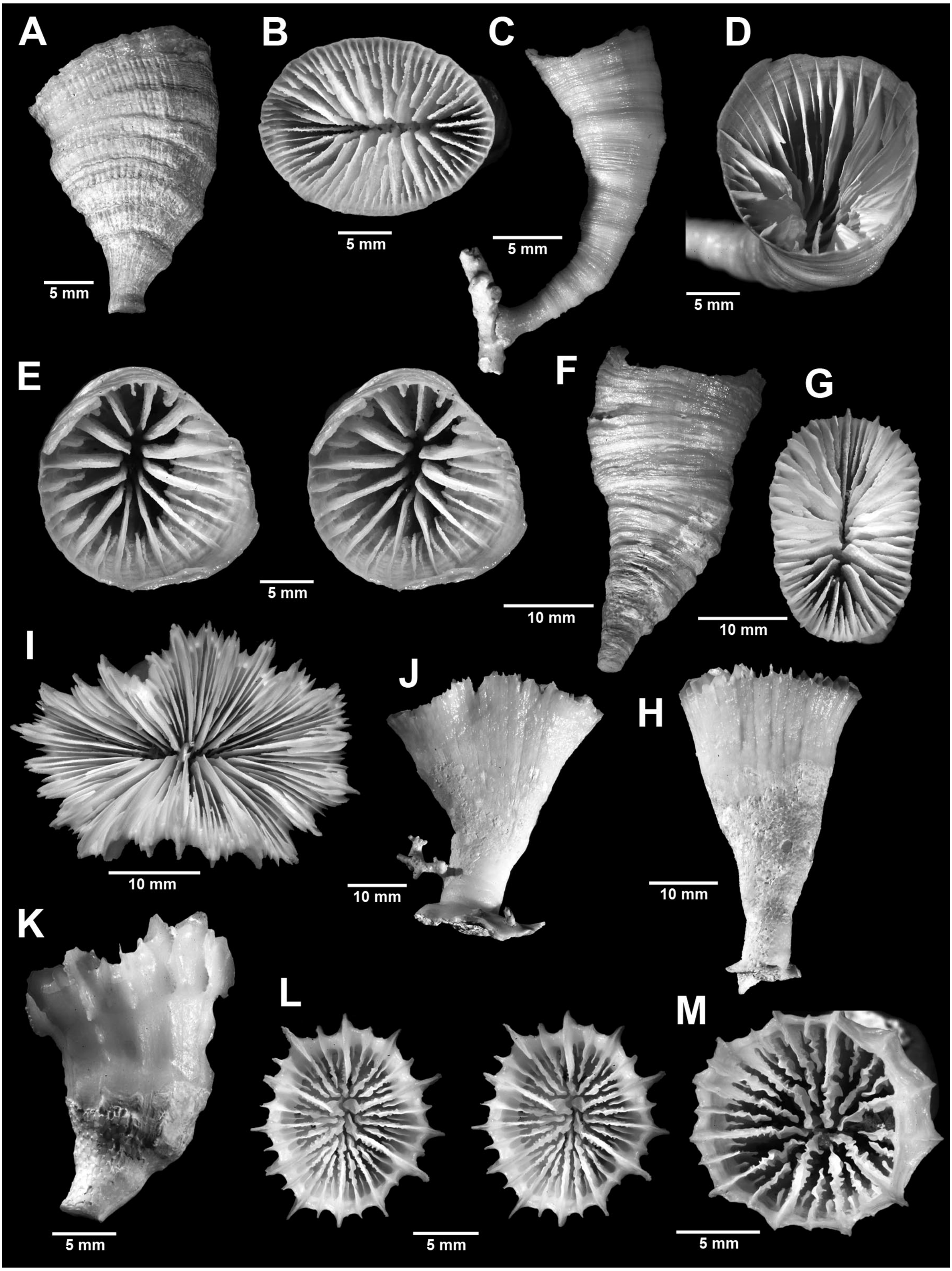

FIGURE 4. A–B, *Flabellum areum*, PAT0209DR4, lateral and calicular views of corallum. C–F, *F. cinctutum*: C, *WH*197/71, lateral view; D–F, holotype, oblique calicular, stereo calicular, and lateral views of corallum. G–H, *Javania antarctica*, PAT1008DR12, calicular and lateral views of corallum. I, *Desmophyllum dianthus*, PAT0108DR11, calicular view of *capense* form. J, *Javania antarctica*, PAT1208DR9, lateral view of corallum. K–M, *Javania cristata*: K–L, holotype, lateral and stereo calicular views of corallum; M, PAT1008DR10, calicular view.

Remarks. This species was well described in the original description. It is characterized by having a thin, fragile, somewhat translucent theca that has a porcellaneous exterior, similar to that of a flabellid. Its septa are non-exsert, the calicular margin a series of equal-sized, equilaterally-shaped triangles. The axial edges of the S3 and the outer edges of the P3 are only slightly sinuous, and the septa are widely spaced, giving the impression of space within the corallum. It is similar to *C. antarctica* but differs in having a thinner theca, non-exsert septa, less sinuous septal and palar axial edges, more uniplanar septa (lacking in tall, rectangular septal face granules), and fewer and larger columellar elements (see Kitahara *et al.* 2010).

Distribution. Previously known only from off Tierra del Fuego and the Falkland Islands at 406–659 m, these records extend its range slightly north (fig. 7) and expand its bathymetric range to 158–1629 m.

Material. PAT0108DR1, 1, MNCN; PAT0108DR11, 1, MNCN, and 1, USNM 1193275; PAT0108DR12, 1, MNCN; PAT0108DR14, 2, MNCN; PAT1008DR4, 4, MNCN; PAT1008DR6, 1, MNCN; PAT1008DR8, 3, MNCN; PAT1008DR9, 1, MNCN; PAT1108DR10, 2, MNCN; PAT1108DR11, 1, MNCN; PAT1208DR4, 1, MNCN; PAT1208DR6, 10, MNCN and 1, USNM 1193276; PAT1208DR7, 2, MNCN; PAT1208DR11, 4, MNCN; PAT1208DR14, 6, MNCN; PAT1208DR16, 2, MNCN; PAT1208DR17, 1, USNM 1193274; PAT0209DR5, 4, MNCN; PAT0209DR9, 3, MNCN; PAT0210DR9, 2, MNCN; PAT0210DR10, 1, USNM 1193273; ATL09Lo92, 1, MNCN; ATL09Lo93, 1, MNCN.

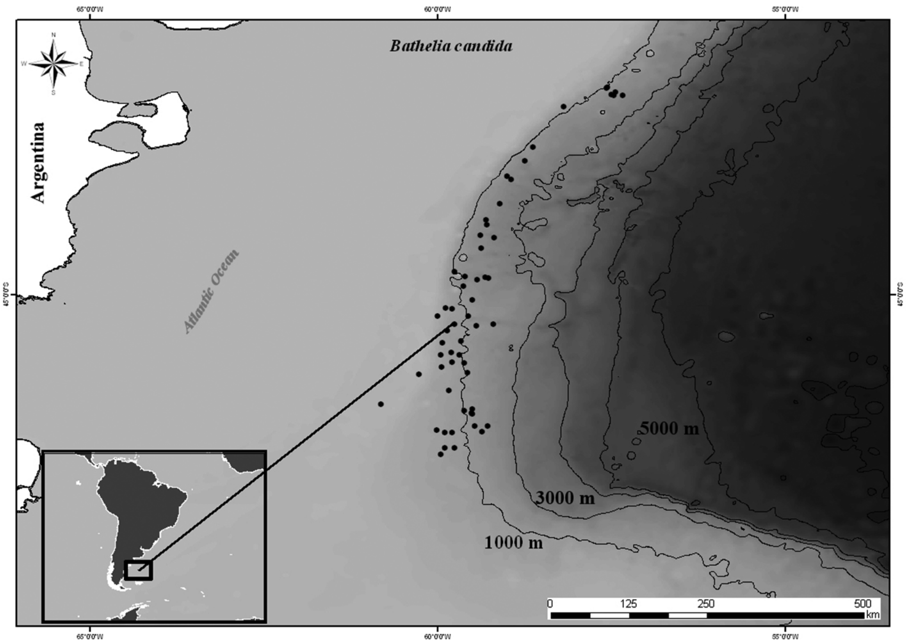

FIGURE 5. Distribution of *Bathelia candida*.

***Caryophyllia kellerae*, n. sp.**
Figs. 2H–I, 8

Description. The corallum is ceratoid, straight, and attached, the holotype measuring 14.7 x 13.4 mm in CD, 35 mm in height, and 4.2 mm in PD (broken); larger coralla attain a GCD of 16 mm and a PD of 4.8 mm. The PD:GCD ranges from 0.29–0.39. The calice is slightly elliptical (GCD:LCD = 1.08–1.20), and the calicular margin relatively even, consisting of a series of uniformly tall (0.8–0.9 mm), isosceles-shaped triangles. Costae are poorly defined, low, and bear low granules; the theca and entire corallum are white.

Septa are hexamerally arranged in four complete cycles (48 septa) according to the formula: S1–2>S4≥S3. As mentioned above, S1–2 are only slightly exsert (0.8–0.9 mm) and have straight to slightly sinuous axial edges that reach 0.8–0.85 the distance to the columella. S3 are equally exsert and have moderately sinuous axial edges that reach about 0.65–0.70 the distance to the columella. At least one, if not both, S4 within each system is as wide if not wider than the S3 within that half-system, ranging from 0.70—0.75 the distance to the columella. The septal faces are uniplanar (not undulating) and covered with rather low granules, which are never aligned in rows or ridges. The 12 P3 form a well-defined elliptical crown, each palus about 1.3 mm wide and having moderately sinuous edges. In one specimen many of the pali had divided in half, appearing as two pali per S3. The fossa is of moderate depth, containing the palar crown and a fascicular columella, consisting of 20–25 slender twisted elements.

Remarks. When *Caryophyllia kellerae* is run through the key of all 66 living species in the genus (Kitahara *et al.* 2010), it comes closest to *C. laevigata* Kitahara, Cairns & Miller, 2010, both species having four cycles of hexamerally arranged septa and S4 that are as wide or wider than their S3. But *C. laevigata* differs in having a dense, brown-colored theca, S1–2 that are more exsert than their S3–4, less columellar elements, and a smaller corallum. Also, it is known only from off New Caledonia (Kitahara, Cairns & Miller 2010). *C. kellerae* also shows a striking resemblance to *C. huinayensis* Cairns *et al.*, 2005, known from the closely adjacent southern fjords of Chile but from slightly shallower water (16–256 m); *C. huinayensis* differs only in having wider S3 than S4 and in having a smaller corallum.

Distribution. Continental shelf off Cabo Blanco, Argentina, 310 m, and from geological cores (age unknown) taken at 1161 m depth south of Cape Horn (Fig. 8).

Material/Types: Holotype: *WH* 311/66, USNM 83398; Paratypes: *WH* 311/66, 6, USNM 1193277; *Vema* 15–121, 258 cm in core, 1, USNM 1130262; *Vema* 15–121, 280 cm in core, 1, USNM 1130260.

Type locality. 47°01'S, 60°43'W (continental shelf off Cabo Blanco, Argentina), 310 m.

Etymology. Named in honor of Natalia B. Keller, for her many contributions to the taxonomy and ecology of deep-water Scleractinia (see Keller 2011).

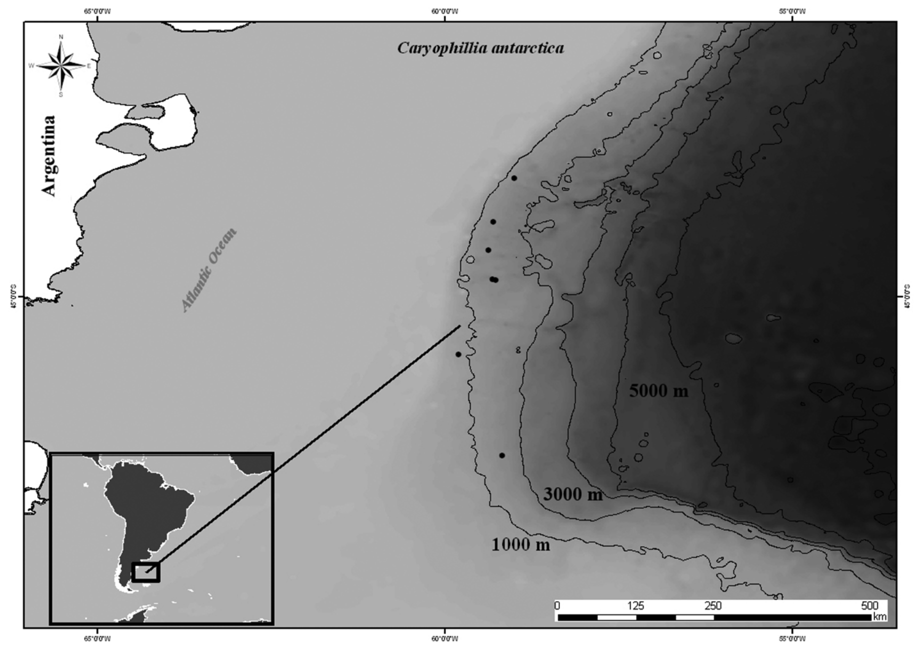

FIGURE 6. Distribution of *Caryophyllia antarctica*.

Caryophyllia coronula, n. sp.

Figs. 2J–K, 9

Description. The corallum is ceratoid, straight or irregularly bent, and attached, the holotype measuring 13.5 x 12.4 in CD, 26.4 mm in height, and 2.6 mm in PD (broken); the PD:GCD ranges from 0.19–0.46. The calice is slightly elliptical (GCD:LCD = 1.06–1.17), the calicular margin being finely serrate (see below) but without lanceted septal groups. The theca is relatively thick, and the costae are poorly defined, flat, somewhat porcellaneous, and bears only very low granules or has a smooth texture; the C3 of the holotype are slightly convex. The entire corallum is white.

Septa are hexamerally arranged in four complete cycles (48 septa) according to the formula S1–2>S3>S4. The S1–2 are only slightly exsert (about 2 mm) and have straight, vertical axial edges that reach about 0.75 of the distance to the columella. S3 are about 1.7 mm exsert, have finely sinuous axial edges only on their lower half, and reach about 0.6 of the distance to the columella. The S4 are about 0.9 mm exsert, have straight axial edges, and reach about 0.4 of the distance to the columella. There are no ridges or undulations on the septal faces. The 12 P3 form a well-defined elliptical crown, each palus about 0.8–1.7 mm wide and having a finely sinuous outer edge and straight axial edge. The fossa is of moderate depth, containing a small fascicular columella consisting of only 2 or 3 twisted elements aligned in the axis of the GCD. Because of the small columella, the axial edges of the pali are close together, forming a small, tight palar crown.

Remarks. When *Caryophyllia coronula* is run through the key of all known *Caryophyllia* species (Kitahara *et al.* 2010), it comes closest to *C. japonica* Marenzeller, 1888, both species having four cycles of hexamerally arranged septa, a relatively narrow pedicel, and S4 that are less wide than their S3. *C. coronula* differs primarily in having a much smaller columella, composed of few elements that are aligned with the greater axis of the calice, and a tighter palar crown, whereas the columella of *C. japonica* consists of an elliptical field of numerous elements and its palar crown is correspondingly larger. Furthermore, *C. japonica* is known only from the northern cold temperate region off Japan to the Commander Islands at depths of 77–1680 m. Within the South American cold temperate region, *C. coronula* is most similar to *C. squiresi*, differing in having a dense theca covered with granular costae (that of *C. squiresi* is thin, almost translucent, and smooth), slightly exsert septa (the septa of *C. squiresi* are non-exsert), and a smaller palar ring that encloses a smaller columella of linearly arranged elements.

Distribution. Known only from stations on the continental slope off Golfo San Jorge, Argentina, 797–1553 m (Fig. 9).

Material/Types: Holotype: PAT1108DR4, USNM 1193281. Paratypes: PAT0108DR1, 26, MNCN; PAT0108DR11, 1, MNCN, and 2 USNM 1193278 and 1193280; PAT0108DR13, 11, MNCN; PAT0108DR14, 1, MNCN; PAT1008DR1, 2, MNCN; PAT1008DR3, 3, MNCN; PAT1008DR4, 4, MNCN; PAT1008DR5, 1, MNCN; PAT1008DR10, 2, MNCN; PAT1008DR12, 8, MNCN 2.04/1110; PAT1108DR3, 2, MNCN 2.04/1108; PAT1108DR4, 1, MNCN; PAT1108DR9, 1, USNM 1193279, and 3, MNCN 2.04/1109; PAT0209DR1, 1, MNCN 2.04/1111; PAT0209DR14, 1, MNCN 2.04/1112.

Type locality. 46.962°S, 59.364°W (continental slope of Golfo San Jorge, off central Argentina), 1242 m.

Etymology. Named *coronula* (Latin for small crown), in allusion to the small palar crown that encircles the modest columella; treated as a noun in apposition.

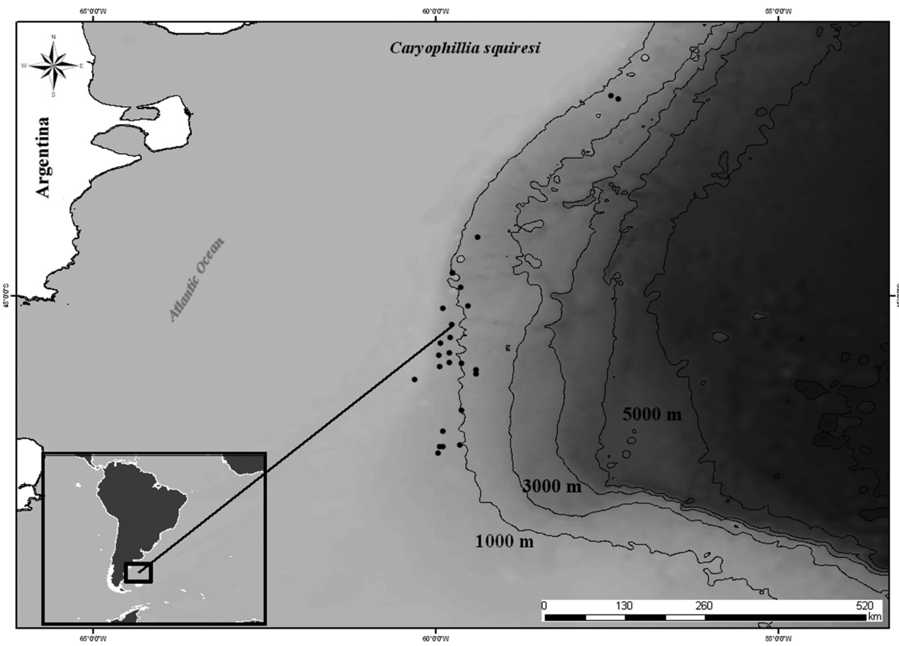

FIGURE 7. Distribution of *Caryophyllia squiresi*.

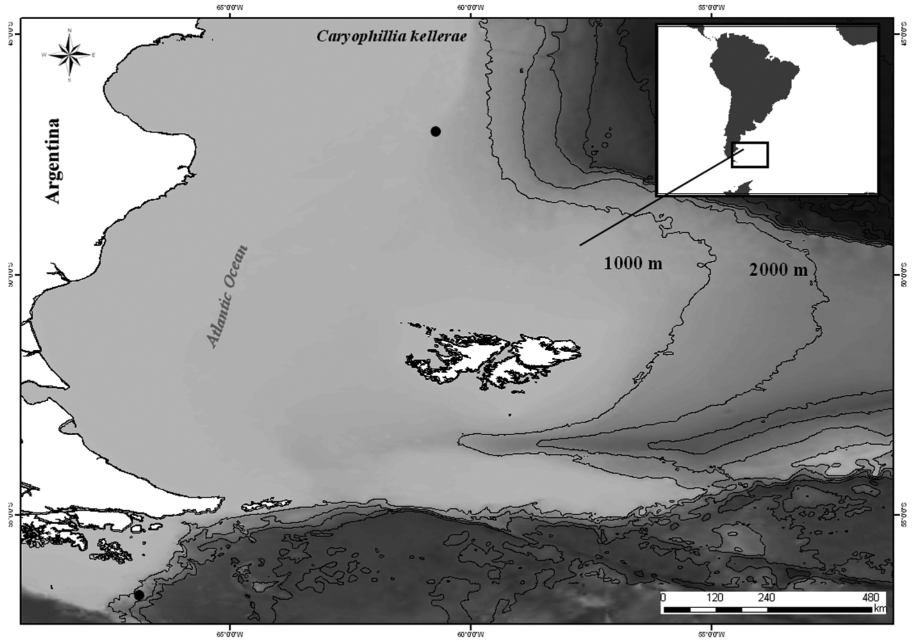

FIGURE 8. Distribution of *Caryophyllia kellerae*.

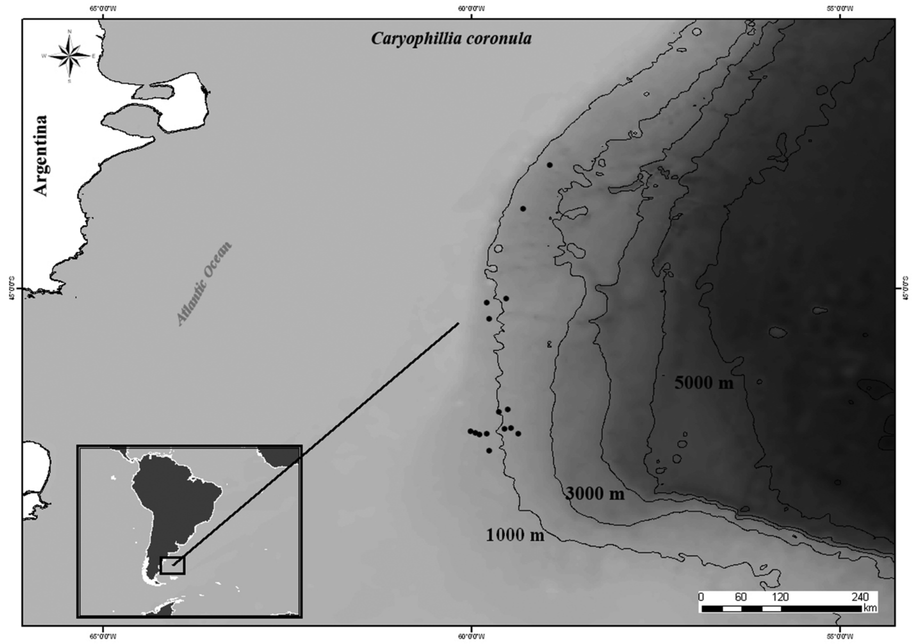

FIGURE 9. Distribution of *Caryophyllia coronula*.

Crispatotrochus cornu (Moseley, 1881)

Figs. 2L–M, 3A–B, 10

Cyathoceras cornu Moseley, 1881: 156–157, pl. 4, fig. 7 (in part: *Challenger* 320).—Cairns, 1979: 67, pl. 12, figs. 1, 3 (lectotype designated).

Crispatotrochus cornu: Cairns, 1991: 15.—Kitahara & Cairns, 2008: 63 (key to species in genus).

Remarks. This species had previously been known from only one specimen, the lectotype, which was briefly re-described and figured by Cairns (1979). Most of the specimens reported herein are all larger than the apparent juvenile lectotype and thus afford a greater analysis of variation. The largest corallum (PAT0209DR14) is 23.8 x 20.1 mm in CD, 7.1 mm in PD, and 27.3 mm in height. The range of GCD:LCD is 1.01–1.18; the range of PD:GCD = 0.3–0.4. The theca is white and porcellaneous, with granulation apparent only near the base of the coralla. As the corallum get larger, additional pairs of S5 are added, often as outpocketings of the calice, each of which contain several septa, the largest corallum having 80 septa – still not a full fifth cycle. This outpocketing, similar to that of *Desmophyllum dianthus* forma *capense* Gardiner, 1904, results in an irregular calicular outline (Fig. 2L). S1–2 are equal in size, their axial edges usually fused to the fascicular columella. The axial edges of the S1–3 are sinuous, and their faces are undulated, having short, discontinuous oblique ridges along the summit of the undulations composed of rectangular granules. The fossa is relatively shallow and the columella is composed of a variable number of wide, loosely twisted elements.

Distribution. Continental slope off northern to central Argentina (Fig. 10), at depths of 586–1629 m. The specimens reported herein expand the known distribution to the south and increase the known bathymetric range, which was previously only 1097 m.

Material. PAT0108DR14, 1, MNCN; PAT0108DR16, 6, MNCN; PAT1108DR4, 8, MNCN; PAT1108DR5, 7, MNCN; PAT1108DR11, 7, MNCN; PAT1208DR11, 1, MNCN; PAT0209DR1, 15, MNCN; PAT0209DR3, 4, MNCN; PAT0209DR4, 29, MNCN, and 1, USNM 1193290; PAT0209DR5, 3, MNCN; PAT0209DR7, 4, MNCN; PAT0209DR8, 16, MNCN; PAT0209DR9, 11, MNCN; PAT0209DR11, 12, MNCN; PAT0209DR12, 7, MNCN; PAT0209DR14, 14, MNCN, and 1, USNM 1193289; PAT0209DR15, 10, MNCN; PAT0209DR16, 23, MNCN, and 1, USNM 1193291; PAT0210DR5, 1, USNM 1193286 and 1193288; PAT0210DR7, 3, MNCN; PAT0210DR9, 7, MNCN; PAT0210BC19, 2, MNCN; ATL09Lo92, 1, USNM 1193287; ATL09Lo100, 1, USNM 1193285; ATL09Lo101, 1, USNM .

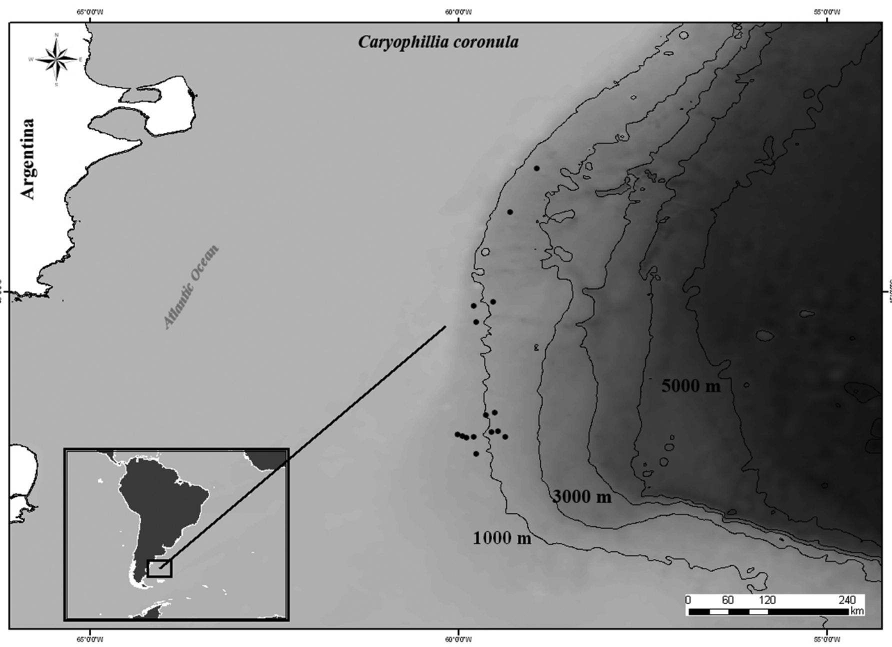

FIGURE 10. Distribution of *Crispatotrochus cornu*.

Monohedotrochus capitolii Kitahara & Cairns, 2005

Figs. 3C–G, 11

Monohedotrochus capitolii Kitahara & Cairns, 2005: 117–121, fig. 1–3.—Kitahara, 2007: 502, 503 (listed).—Kitahara *et al.*, 2009: 228 (listed).

Remarks. This species was fairly well characterized in the original description, which was based on 41 specimens, but most of the specimens reported herein are larger than the largest previously reported, and thus allow for additional morphological observations. The largest specimen (PAT1008DR3) is 22.4 mm in CD (circular) and 26.4

mm in height. It contains 76 septa, or 14 pairs of S5, but still not a full fifth cycle. Kitahara & Cairns (2005:119) reported that "robust horizontal curled trabecular lobes" occurred on the lower axial edges of the S1–3 linking those septa to the columella, but these lobes are better interpreted as slender paliform lobes, and they do not occur on the axial edges of the S3, only the twelve S1–2. These P1–2 are separated from their respective septa (S1–2) by a wide notch, and are lamellar basally, becoming cylindrical (rod-shaped), and blunt-tipped apically. They are indistinguishable from the columellar elements, which are of the same size and shape. This species was one of the most commonly collected species in the study area.

Distribution. The specimens reported herein do not appreciably extend the known geographic range of the species, which consists of the continental shelf (150–460 m) off southernmost Brazil (Rio Grande do Sul and Santa Catarina states) but significantly deeper on the continental slope (721–1620 m) off central Argentina (Fig. 11).

Material. PAT0108DR1, 47, MNCN; PAT0108DR2, 1, MNCN; PAT0108DR3, 2, MNCN; PAT0108DR7, 46, MNCN; PAT0108DR11, 2, MNCN, and 3, USNM 1192658 and 1192653; PAT1008DR1, 50, MNCN; PAT1008DR3, 3, MNCN, and 1, USNM 1192656; PAT1008DR4, 11, MNCN; PAT1008DR8, 8, MNCN, and 3, USNM 1192652; PAT1008DR9, 13, MNCN; PAT1008DR10, 2, MNCN; PAT1008DR12, 1, MNCN; PAT1008DR13, 3, MNCN; PAT1108DR3, 11, MNCN; PAT1108DR4, 2, MNCN; PAT1108DR9, 4, MNCN, and 1, USNM 1192664; PAT1108DR10, 2, MNCN; PAT1108DR11, 4, MNCN; PAT1208DR4, 1, MNCN; PAT1208DR7, 14, MNCN; PAT1208DR9, 8, MNCN; PAT1208DR11, 1, MNCN; PAT0209DR1, 6, MNCN; PAT0209DR3, 1, MNCN; PAT0209DR5, 2, MNCN; PAT0209DR7, 3, MNCN; PAT0209DR10, MNCN; PAT0209DR11, 1, USNM 1192654; PAT0209DR14, 2, MNCN; PAT0210DR7, 3, MNCN; PAT0210DR11, 1, USNM 1192657; ATL09Lo101,1, USNM 1192757.

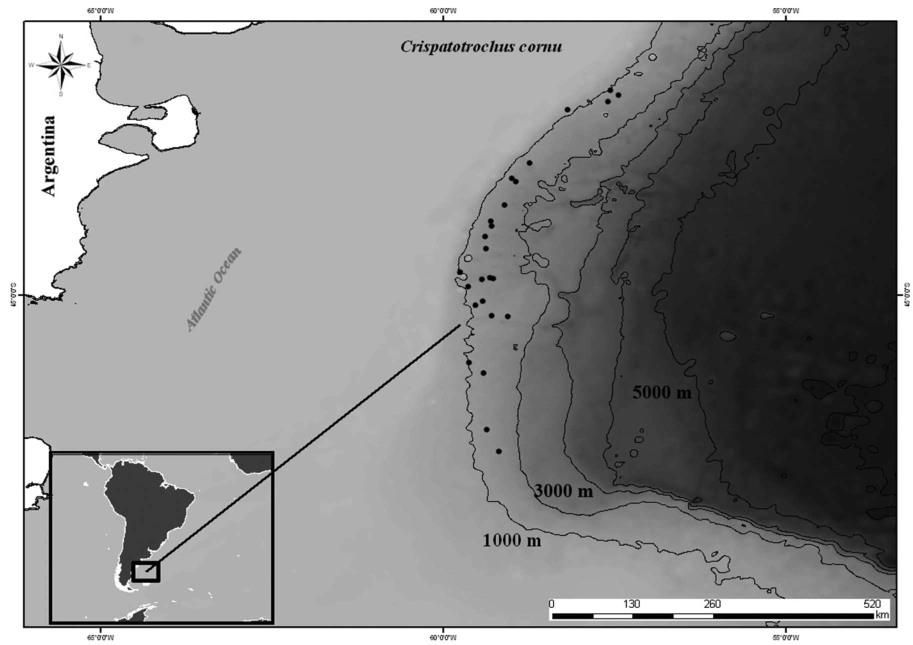

FIGURE 11. Distribution of *Monohedotrochus capitolii*.

Desmophyllum dianthus (Esper, 1794)

Figs. 3H–I, 4I, 12

Madrepora dianthus Esper, 1794: pl. 69, figs. 1–3.

Desmophyllum cristagalli Milne Edwards & Haime, 1848: 253, pl. 7, figs. 10, 10a.—Squires, 1969: 17, pl. 6, map 1.—Cairns, 1982: 29–30, pl. 8, figs. 9–12, pl. 9, figs. 1–3, map 6 (synonymy); 1990: 43–44, fig. 15.

Desmophyllum ingens Moseley, 1881: 160–162, pl. 4, figs. 1–6, pl. 5, figs. 1–4a.—Squires, 1969: 17, pl. 6, map 1.

Desmophyllum capense Gardiner, 1904: 96–97.

Desmophyllum cristagalli forma *capense*: Cairns, 1982: 29.

Desmophyllum dianthus: Cairns, 1994: 26–27, pl. 9a–d (synonymy, neotype designation).—Cairns *et al*., 2005: 36–39, figs. 5A–E, 6F–H, 7.—Kitahara, 2007, 502, 503 (listed).—Kitahara *et al*., 2009: 228 (listed).

Remarks. This is an extremely commonly collected deep-water coral, having been described and illustrated many times (see synonymy). Most of the specimens reported herein are of the typical form (see Cairns 1982), but one is of the *capense* form (PAT0108DR11, Fig. 4I), that specimen having 116 septa, or 10 pairs of S6. The largest specimen (PAT0209DR9) is 55.9 x 41.2 mm in CD.

Distribution. *Desmophyllum dianthus* is one of about a dozen cosmopolitan species of Scleractinia, occurring everywhere but off continental Antarctica, at depths ranging from 8–2460 m (Roberts *et al.* 2009: www.lophelia.org/coldwatercoralsbook). It has been previously reported from both Atlantic and Pacific coasts of Patagonia (Cairns 1982, Cairns *et al.* 2005). The newly reported Argentinean records range from 733–1629 m and occur throughout the study area (Fig. 12).

Material. PAT0108DR11, 2, USNM 1192954; PAT1008DR1, 1, USNM 1192956; PAT1008DR4, 2, MNCN, and 1, USNM 1192957; PAT1008DR6, 1, USNM 1192953; PAT1208DR4, 1, MNCN; PAT0209DR7, 1, USNM 1192950; PAT0209DR8, 1, MNCN; PAT0209DR9, 2, MNCN, and 1, USNM 1192952; PAT0209DR10, 1, USNM 1192955; PAT0209DR11, 1, USNM 1192949; PAT0209DR15, 3, MNCN; PAT0209DR16, 3, MNCN, and 1, USNM 1192951; ATL08Lo14, 1, MNCN.

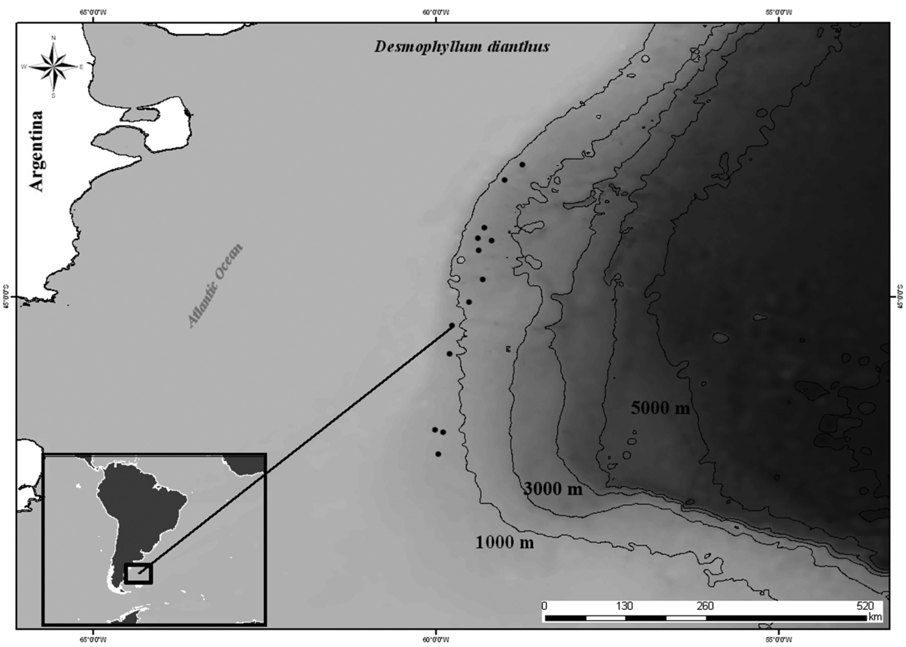

FIGURE 12. Distribution of *Desmophyllum dianthus*.

Solenosmilia australis, n. sp.

Figs. 3J, 13

Solenosmilia variabilis: Squires, 1969: 18, pl. 6, map 2 (in part: record from off Chile).—Cairns *et al.*, 2005: 40, fig. 2J.

Description. The corallum is colonial and bushy, increasing by equal intratentacular budding, producing pairs of equal-sized calices at each branch tip. The holotype is only 3.3 cm tall and 4 cm wide, composed of three pairs of corallites. One of the largest colonies (USNM 1022415) is 6 cm in height. The corallites are cylindrical and circular to slightly elliptical in cross section, often about 7.5 mm in GCD but some as much as 10 mm in diameter. The costae are poorly defined, and the theca is relatively smooth; the corallum is white.

Septa are arranged irregularly in three or four size classes, such as: 8:8:16 (32 septa) or 9:9:18:2 (38 septa). These differences probably reflect the increase in size of a calice before it divides into two smaller corallites. The axial edges of the 8 or 9 primary septa are straight and border the rudimentary columella. The secondary septa are about 0.9 the width of a primary and have slightly sinuous axial edges. The tertiary septa are about 0.5 the width of a primary, and have straight axial edges. Quaternary septa, if present, are rudimentary, confined to the upper corallite near the calice. None of the septa are exsert, and all have relatively smooth septal faces. The fossa is deep and contains a small fascicular columella consisting of 1–4 small, twisted elements. Tabular endothecal dissepiments are common.

Remarks. The only other species in this genus is the well-known cosmopolitan species *Solenosmilia variabilis* Duncan, 1873. *S. australis* differs from that species in having larger calices (those of *S. variabilis* are only about 4–5 mm in GCD), smoother theca (that of *S. variabilis* is costate), smaller colonies (those of *S. variabilis* attain 0.5 m in height), and by having a variable number of non-hexamerally arranged septa (those of *S. variabilis* are hexamerally arranged). Also, *S. variabilis* usually lives in association with a commensal eunicid polychaete, and *S. australis* does not.

Distribution. Off central Argentina and off Peninsula Taitao, Chile, 650–1620 m (Fig. 13).

Material. Holotype: PAT1108DR1, 1 colony, USNM 1192958. Paratypes: PAT0108DR8, 2, MNCN; PAT1008DR8, 1, MNCN; PAT1008DR11, 1, MNCN 2.04/1106: PAT1008DR12, 1, MNCN 2.04/1107; PAT1008DR13, 6, MNCN; PAT1108DR3, 10, MNCN; PAT1108DR9, 2, MNCN; PAT1208DR4, 3, MNCN 2.04/1103; PAT1208DR6, 2, MNCN 2.04/1104; PAT1208DR7, 10, MNCN 2.04/1105, and 1 as substrate of *Javania antarctica*, USNM 1193323; PAT1208DR9, 1, MNCN; PAT1208DR14, 1, MNCN; PAT0209DR5, 2, MNCN; PAT0209DR7, 2, MNCN; PAT0209DR14, 1, MNCN; *Vema* 17–14RD, 1 colony, USNM 1022415.

Type locality. 44.890°S, 60.028°W (continental slope off Cabo Dos Bahías, Argentina), 650 m.

Etymology. Named *australis* (Latin for southern), in allusion to its southern hemisphere distribution.

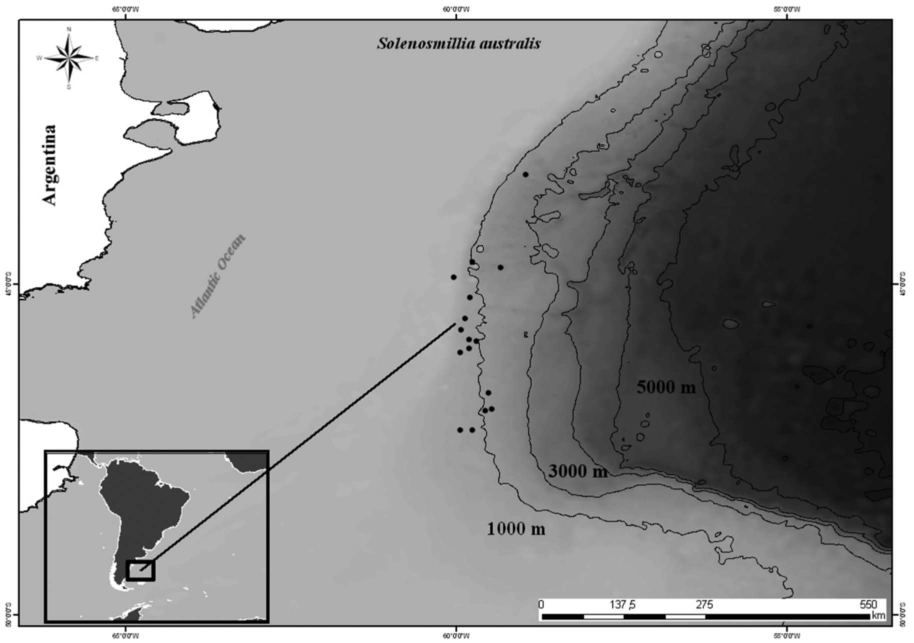

FIGURE 13. Distribution of *Solenosmilia australis*.

Family Flabellidae

Flabellum curvatum Moseley, 1881
Figs. 1A, 3K–M, 14

Flabellum curvatum Moseley, 1881: 174–175, pl. 6, figs. 3a–d.—Squires, 1969: 18, pl. 6, map 3.—Cairns, 1982: 35–38, pl. 10, figs. 10–11, pl. 11, figs. 6–9, map 9 (complete synonymy); 1990: 50–51, fig. 17.—Cairns *et al.*, 2005: 40.

Remarks. This species was well described and figured by Cairns (1982). The largest specimen examined from off Argentina (ATL09-Lo59) is 47.8 x 30.6 mm in calicular diameter and 68 mm in height. Some specimens (Fig. 3M) differ slightly from the typical populations in having less corallum curvature, a straight pedicel, and lacking serrations in the septal notch near the calicular margin. These differences may be related to depth, as these three specimens were collected from 1343–1620 m, and are thus considered as representing the deep-water form of this species. Also, see Remarks of *F. thouarsii* for a comparison to that very similar species.

Flabellum curvatum was the most frequently collected species from this region, often occurring in high density (Fig. 1B) and being collected by the hundreds from one trawl.

Distribution. Known from entire coast of Argentina from Rio de la Plata to Tierra del Fuego, Falkland Islands, South Georgia, and the southern fjords of Chile, at depths of 115–1137 m (Fig. 14). The records reported herein do not extend its geographic range but do extend its deepest bathymetric range from 1137 to 1620 m.

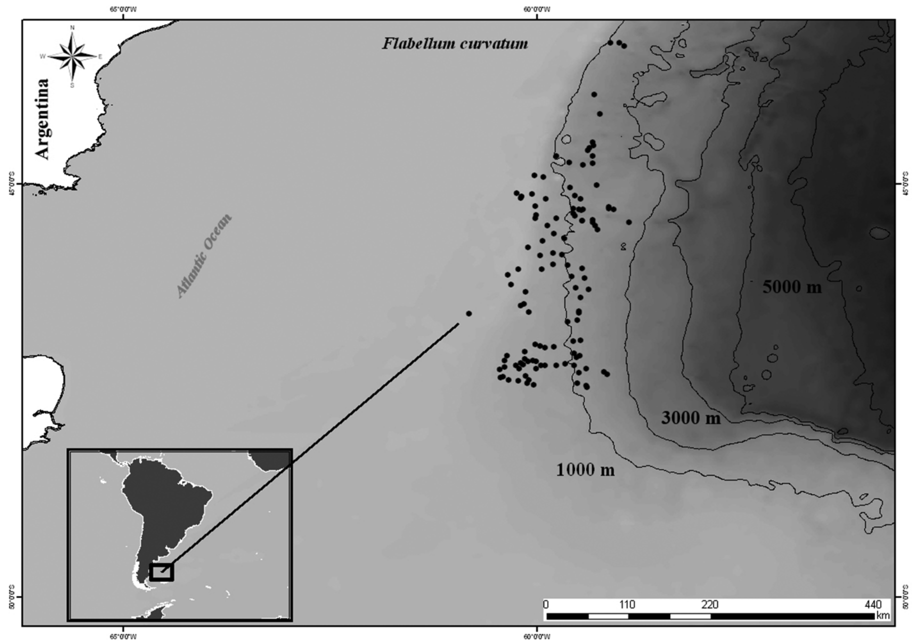

FIGURE 14. Distribution of *Flabellum curvatum*.

Material. *Typical form*: PAT0108DR1, 40, MNCN; PAT0108DR8, 1, MNCN; PAT0108DR11, 1, MNCN; PAT0108DR12, 10, MNCN; PAT0108DR14, 20, MNCN; PAT1008DR1, 3, MNCN; PAT1008DR3, 5, MNCN; PAT1008DR4,11, MNCN; PAT1008DR5, 1, MNCN; PAT0108DR17, 9, MNCN; PAT1008DR8, 1, MNCN; PAT1008DR9, 2, MNCN; PAT1008DR10, 5, MNCN; PAT1008DR11, 2, MNCN; PAT1008DR12, 7, MNCN; PAT1008DR13, 9, MNCN; PAT1108DR1, 1, USNM 1193299; PAT1108DR2, 1, MNCN; PAT1108DR3, 1, MNCN; PAT1108DR5, 20, MNCN; PAT1108DR8, 6, MNCN; PAT1108DR10, 3, MNCN; PAT1108BC5, 5, MNCN; PAT1208DR4, 1, MNCN; PAT1208DR5, 12, MNCN; PAT1208DR6, 9, MNCN; PAT1208DR7, 7, MNCN; PAT1208DR9, 14, MNCN; PAT1208DR10, 2, MNCN; PAT1208DR11, MNCN; PAT1208DR14, 6, MNCN, and 1, USNM 1193304; PAT1208DR16, 7, MNCN, and 3, USNM 1193296 and 1193302; PAT1208DR17, 1, USNM 1193294; PAT1208DR18, 2, MNCN; PAT0209DR1, 9, MNCN; PAT0209DR2, 7, MNCN; PAT0209DR3, 16, MNCN; PAT0209DR5, 9, MNCN; PAT0209DR14, 9, MNCN; PAT0209Dr15, 3, MNCN; PAT0209BC7, 4, MNCN; PAT0209BC27, 5, MNCN; PAT0209BC34, 1, MNCN; PAT0210DR4, 19, MNCN; PAT0210DR6, 4, MNCN; PAT0210DR7, 6, MNCN; PAT0210DR8, 2, MNCN; PAT0210DR9, 1, MNCN; ATL08Lo3, 2, MNCN; ATL08Lo48, 1, MNCN; ATL08Lo54, 2, MNCN; ATL08Lo56, 1, MNCN; ATL08Lo57, 5, MNCN; ATL08Lo68, 2, MNCN; ATL08Lo72, 3, MNCN; ATL08Lo75, 2, MNCN; ATL08Lo78, 4, MNCN; ATL08Lo86, 1, MNCN; ATL08Lo97, 1, MNCN; ATL08Lo103, 3, MNCN; ATL08Lo104, 5, MNCN; ATL08Lo107, 2, MNCN; ATL08Lo108, 7, MNCN; ATL08Lo111, 1, MNCN; ATL08Lo124, 1, MNCN; ATL08Lo129, 1, MNCN; ATL08Lo136, 1, MNCN; ATL09Lo7, 1, MNCN; ATL09Lo8, 1, MNCN; ATL09Lo9, 1, MNCN; ATL09Lo14, 30, MNCN; ATL09Lo15, 4, MNCN; ATL09Lo52, 1, MNCN; ATL09Lo56, 1, MNCN; ATL09Lo57, 1, MNCN; ATL09Lo58, 3, MNCN; ATL09Lo59, 2, MNCN, and 2, USNM 1193297; ATL09Lo60, 6, MNCN; ATL09Lo61, 2, MNCN; ATL09Lo63, 9, MNCN; ATL09Lo65, 8, MNCN; ATL09Lo66, 7, MNCN, and 1, USNM 1193295; ATL09Lo67, 3, MNCN; ATL09Lo69, 4, MNCN; ATL09Lo70, 1, MNCN; ATL09Lo71, 4, MNCN; ATL09Lo72, 3, MNCN; ATL09Lo73, 1, MNCN; ATL09Lo74, 1, MNCN; ATL09Lo77, 3, MNCN; ATL09Lo79, 2, MNCN; ATL09Lo80, 1, MNCN; ATL09Lo81, 2, MNCN; ATL09Lo83, 4, MNCN; ATL09Lo84, 1, MNCN; ATL09Lo86, 1, MNCN; ATL09Lo91, 6, MNCN; ATL09Lo92, 1, USNM 1193303; ATL09Lo95, 4, MNCN; ATL09Lo96, 1, MNCN; ATL09Lo98, 2, MNCN; ATL09Lo103, 1, MNCN; ATL09Lo112, 3, MNCN; ATL09Lo113, 2, MNCN;

ATL09Lo113, 2, MNCN; ATL09Lo117, 2, MNCN; ATL09Lo118, 2, MNCN; ATL0310Lo2, 4, MNCN; ATL0310Lo3, 18, MNCN; ATL0310Lo4, 1, MNCN; ATL0310Lo7, 10, MNCN; ATL0310Lo8, 7, MNCN; ATL0310Lo9, 10, MNCN; ATL0310Lo10, 3, MNCN; ATL0310Lo23, 1, MNCN; ATL0310Lo33, 2, MNCN; ATL0310Lo34, 1, MNCN; ATL0310Lo51, 1, MNCN; ATL0310Lo53, 1, MNCN; ATL0310Lo59, 2, MNCN; ATL0310Lo60, 1, MNCN; ATL0310Lo64, 1, MNCN; ATL0310Lo79, 1, MNCN; ATL0310Lo87, 2, MNCN; ATL10Lo89, 2, USNM 1193298. *Deep-water straight form*: PAT0209DR7, 1, USNM 1193301; ATL09Lo100, 1, USNM 1193300; ATL09Lo101, 1, USNM 1193305.

Flabellum thouarsii **Mine Edwards & Haime, 1848**

Figs. 3N–O, 15

Flabellum thouarsii Milne Edwards & Haime, 1848: 265, pl. 8, fig. 5.—Squires, 1969: 18, p. 6, map 4.—Cairns, 1982: 34–35, pl. 10, figs. 3–7 (complete synonymy).

Remarks. *Flabellum thouarsii* is quite similar to *F. curvatum*, and their ranges are sympatric as well. In time they may be shown to be the same species or recently evolved from a common ancestor. Cairns (1982) listed six morphological distinctions between the species. He also mentioned a difference in depth ranges, although the specimens reported herein invalidate the distinction based on depth. The other six criteria are also somewhat variable. In essence, the primary way to distinguish *F. thouarsii* is that it usually has a shorter and straight (vs longer and bent) pedicel, it has a straight corallum (that of *F. curvatum* is usually slightly curved in the plane of the LCD), it lacks the fine serration on the axial septal edge in the septal notch region (adjacent to the calice), whereas *F. curvatum* usually does have this fine serration on its larger septa, it has a flatter elliptical calice, and it usually has more epizootic animals attached to its theca.

Distribution. The distribution of *F. thouarsii* is essentially identical to that of *F. curvatum* (Fig. 15), except for the outliers of southern Chile and South Georgia, at depths of 71–305 m (Cairns 1982); however, the records herein extend the known depth range to 1513 m, much deeper than previously known.

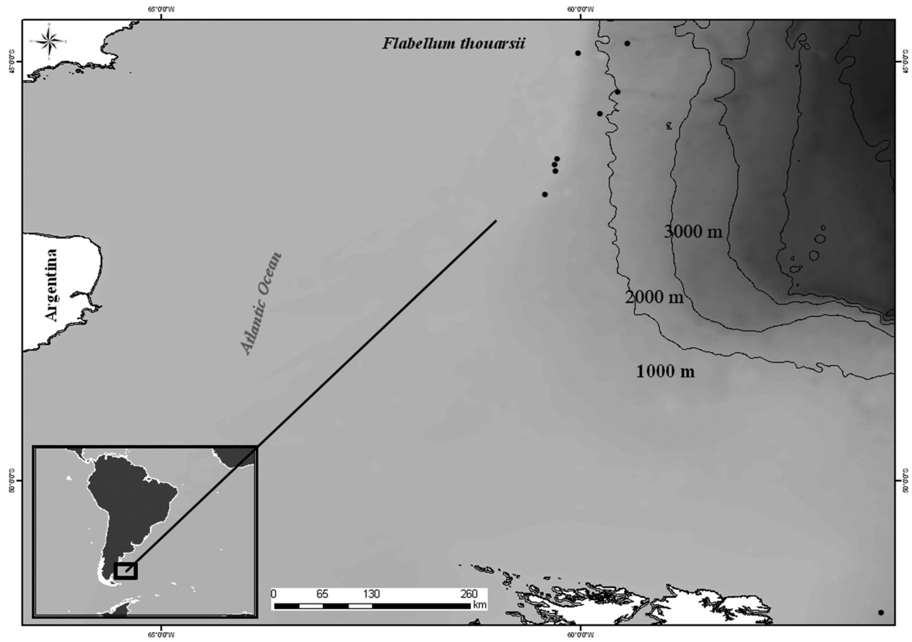

FIGURE 15. Distribution of *Flabellum thouarsii*.

Material. PAT1108DR1, 4, MNCN; PAT1108DR10R, 1, MNCN; PAT1208DR2, 11, MNCN; PAT1208DR17, 9, MNCN; PAT0209DR3, 1, USNM 1193307; ATL09Lo45, 1, MNCN; ATL09Lo53, 2, MNCN; ATL10Lo89, 1, USNM 1193306; *WH* 336-66, 1, USNM 83382.

***Flabellum areum* Cairns, 1982**
Figs. 4A–B, 16

Flabellum areum Cairns, 1982: 35, pl. 11, figs. 1–5.

Remarks. The illustrated specimen is 21.6 x 15.9 mm in CD, 30.0 mm in height, and 4.1 mm in PD. It has 78 septa arranged in three size classes: 20:20:38. When well preserved, the tissue covering the S1–2 is thick and translucent or light purple.

It resembles *F. thouarsii*, but can be distinguished by its larger pedicel diameter, its widely spaced septa, and its fuller corallum. It is distinguished from *F. curvatum* by having a straight and shorter but fatter pedicel (3.5–5.0 mm in diameter), and a circular flat base; a smaller and usually straight corallum (if curved it is curved in the plane of the greater calicular axis).

Distribution. Previously known from off Mar del Plata, Tierra del Fuego, and the Falkland Islands at 1647-2229 m, the records reported here extends geographic distribution from 41.5 to 47.3° S (Fig. 16) and its upper bathymetric range to 749 m, although most records are deeper than 1200 m.

Material. PAT0108DR15, 6, MNCN; PAT1108DR4, 9, MNCN; PAT1108DR11, 1, MNCN; PAT1108BC14, 2, MNCN; PAT0209DR4, 29, MNCN, and 1, USNM 1193310; PAT0209DR8, 3, MNCN; PAT0209DR9, 9, MNCN; PAT0209DR11, 10, MNCN; PAT0209DR12, 7, MNCN; PAT0209DR16, 10, MNCN; PAT0210DR4, 14, MNCN; ATL08Lo62, 1, MNCN; ATL08Lo68, 1, MNCN; ATL08Lo111, 4, MNCN; ATL08Lo114, 1, MNCN; ATL08Lo130, 1, MNCN; ATL08Lo132, 1, MNCN; ATL09Lo10, 1, MNCN; ATL09Lo100, 5, MNCN, and 1, USNM 1193309; ATL09Lo101, 2, MNCN; ATL09Lo107, 2, MNCN; ATL09Lo113, 2, MNCN.

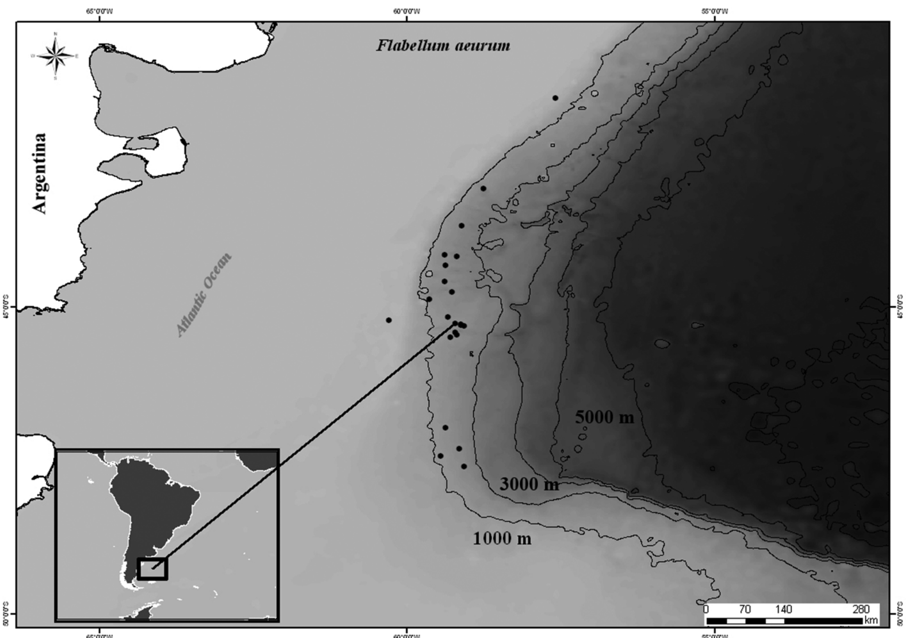

FIGURE 16. Distribution of *Flabellum areum*.

***Flabellum cinctutum*, n. sp.**
Figs. 4C–F, 17

Description. The corallum is subcylindrical to ceratoid, the largest specimen (PAT1208DR16) measuring 21.4 mm in CD (circular) and 42.3 mm in height. The holotype measures 18.7 x 19.4 mm in CD, 38.0 mm in height, and has a PD of 3.1 mm; however, the base of most specimens is slightly wider than the lower pedicel, up to 3.8 mm in diameter. The coralla are rarely straight, but usually bent or curved in an irregular fashion (scolecoid), often changing diameter abruptly, as though reacting to an injury, which may be the case because the theca is extremely thin and fragile. The entire theca is encircled by numerous (6–8/mm), low, horizontal ridges; these ridges are straight, not rising to peaks at each costal insertion as in most flabellids. Small (0.1 mm in diameter), rounded granules are aligned on these ridges, giving the theca a slightly rough texture. The corallum is white and porcellaneous.

The septa are hexamerally arranged in four complete cycles (48 septa) according to the formula: S1–2>>S3>S4. The axial edges of the S1–2 are straight and extend almost to the center of the calice, producing a very deep and narrow fossa. Their upper edges form a graceful concave arch as they approach the calicular edge, but completely attenuate about 2.5 mm from the calicular edge. There is no evidence of a pseudocolumella or fusion of the lower axial edges of the S1–2. The S3 are much smaller (only about 0.9 mm in width), their axial edges finely sinuous. The S4 are smaller still (0.4–0.5 mm wide), almost rudimentary, and also have finely sinuous axial edges accompanied by small pointed spines.

Remarks. *Flabellum cinctutum* resembles *F. flexuosum* Cairns, 1982 in corallum morphology, both species having fragile, irregularly shaped, ceratoid coralla. But, *F. cinctutum* differs in having only four cycles of septa (*F. flexuosum* has five), straight axial edges of the S1–2 (those of *F. flexuosum* are sinuous), and its theca is consistently ringed and granulated (the theca of *F. flexuosum* may be ringed but usually only on the lower half and in a chevron-shaped pattern, never having granules). Furthermore, *F. flexuosum* is known only from the Antarctic region, and generally at shallower depths (101–659 m).

Distribution. Continental slope off central Argentina (Fig. 17), 500–1626 m.

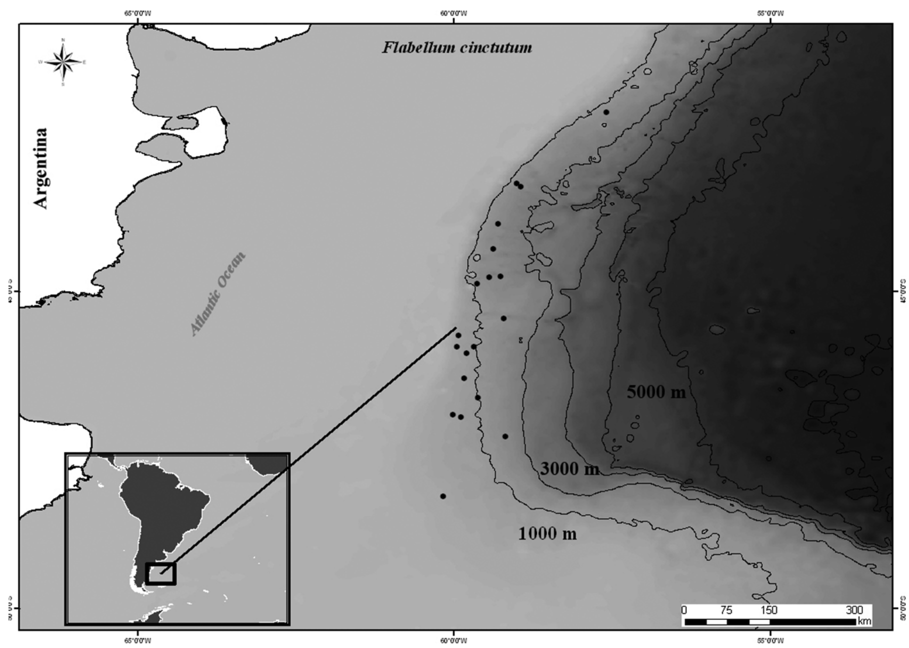

FIGURE 17. Distribution of *Flabellum cinctutum*.

Material/Types. Holotype: PAT0209DR3, USNM 1193313. Paratypes: PAT0108DR1, 6, MNCN 2.04/1113; PAT0108DR7, 3, MNCN; PAT0108DR15, 3, MNCN 2.04/1116, and 2, USNM 1193314 and 1193311; PAT1008DR1, 6, MNCN; PAT1008DR4, 2, MNCN; PAT1108DR5, 2, MNCN; PAT1108DR11, 1, MNCN 2.04/1115; PAT1208DR7, 5, MNCN 2.04/1114; PAT1208DR9, 1, MNCN; PAT1208DR14, 1, MNCN; PAT1208DR16, 1, MNHN; PAT0209DR1,1,MNCN; PAT0209DR3, 2, USNM 1193316; PAT0209DR4, 7, MNCN, and 1, USNM 1193312; PAT0209DR8, 4, MNCN; PAT0209DR14, 2, MNCN 2.04/1117; PAT0209DR15, 3, MNCN; PAT0210BC19, 1, MNCN; *WH*197/71, 1, USNM 83397.

Type locality. 44.769°S, 59.438°W (continental slope off Cabo Raso, Argentina), 1513 m.

Etymology. From the Latin *cinctutus* (meaning girded, enclosed, encircled as though by a belt or band), an allusion to the numerous, fine, granulated, horizontal epithecal bands that encircle the corallum.

Javania antarctica (Gravier, 1914)

Figs. 4G–H, J, 18

Desmophyllum antarcticum Gravier, 1914: 236–238.
Javania antarctica: Cairns, 1982: 48–50, pl. 15, figs. 1–4, map 12 (complete synonymy); 1990: 60–62, fig. 23; 2004:8, 10 (key).

Remarks. *Javania antarctica* was adequately re-described by Cairns (1982). The largest of the specimens reported herein (Fig. 4H) is 33.0 x 18.9 mm in CD, 36.3 mm in height, and 8.6 mm in PD. The species can be characterized as having a thick stereome-reinforced pedicel, and five full cycles of septa (96) following the formula: S1–2>S3>>S4>S5, the S3 being only slightly less wide than the S1–2. The axial edges of all septa are only slightly sinuous. It may be confused with *Desmophyllum dianthus*, but can be distinguished by its smooth, porcellaneous theca (vs costate and granular), less exsert septa, and more fragile septa.

Distribution. Previously known only from Antarctic waters off the Antarctic Peninsula, Weddell Sea, and the Scotia Ridge north to South Georgia at depths of 53–1280 m, these records extend its known distribution considerably northward to the cold temperate region off central Argentina (Fig. 18) at to the depth of 1626 m.

Material: PAT0108DR2, 1, MNCN; PAT0108DR7, 29, MNCN; PAT0108DR11, 1, MNCN; PAT0108DR15, 6, MNCN, and 1, USNM 1193321; PAT1008DR1, 1, MNCN; PAT1008DR12, 5, MNCN, and 2, USNM 1193320 and 1193319; PAT1008DR13, 19, MNCN; PAT1108DR1, 3, MNCN; PAT1108DR3, 8, MNCN; PAT1108DR5, 1, MNCN; PAT1108DR11, 9, MNCN; PAT1208DR7, 3, MNCN, and 1, USNM 1193323 and 1193324; PAT1208DR9, 11, MNCN, and 2, USNM 1193315; PAT1208DR14, 1, MNCN; PAT0209DR1, 6, MNCN; PAT0209DR3, 1, USNM 1193318 and 1193316; PAT0209DR4, 2, MNCN; PAT0209DR7, 1, MNCN; PAT0209DR10, 2, MNCN; PAT0209DR11, 3, MNCN; PAT0209DR14, 8, MNCN; PAT0209DR15, 4, MNCN; PAT0209DR16, 3, MNCN; PAT0210DR5, 3, MNCN; PAT0210DR6, 1, MNCN; PAT0210DR7, 1, MNCN; PAT0210DR8, 1, MNCN; ATL0310Lo87, 2, MNCN.

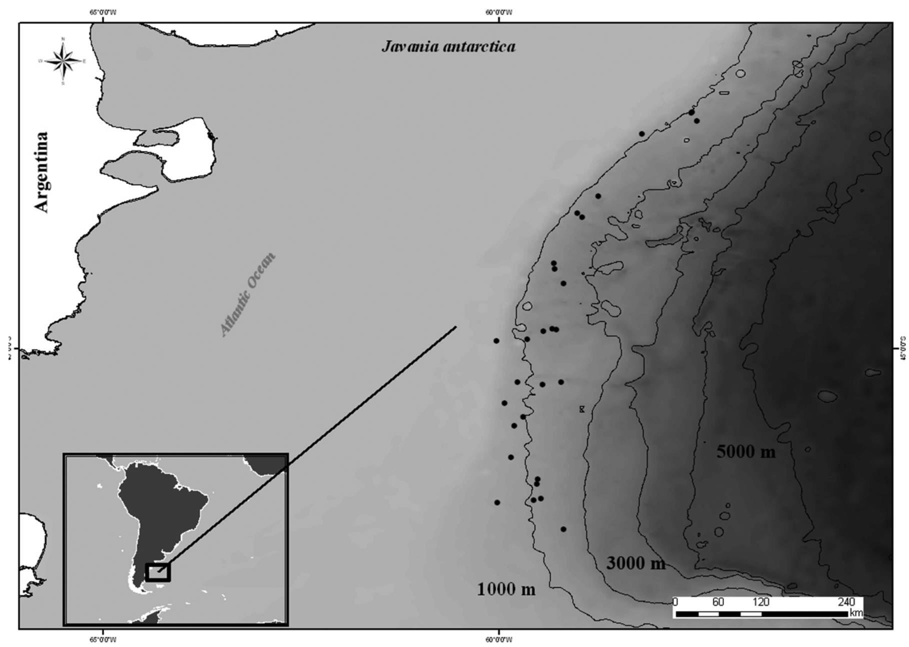

FIGURE 18. Distribution of *Javania antarctica*.

Javania cristata, n. sp.

Figs. 4K–M, 19

Javania cailleti (Duchassaing & Michelotti, 1864): Cairns, 1982: 46–48 (in part: *Eltanin* 1592, pl. 14, figs. 11–12).

Description: The corallum is ceratoid to trochoid in shape, straight or irregularly bent, and attached by a slender, stereome-reinforced pedicel, which is up to 4.9 mm in diameter (PD:GCD = 0.21–0.26). The largest specimen (PAT1208DR9) is 18.8 x 16.3 mm in CD and 35 mm in height. The holotype measures 15.0 x 12.6 mm in CD, 23.4 mm in height, and 3.3 mm in PD (broken). The ratio of GCD:LCD ranges from 1.1 to 1.7, but is most commonly about 1.2. The theca is white, porcellaneous, and smooth, except in the upper half of large coralla especially near the calice, where the C1–2 are sharply ridged, standing up to 1.7 mm in height.

The septa are hexamerally arranged in four complete cycles according to the formula: S1>S2>S3>>S4. Below a GCD of 9 mm only three cycles of septa are present, the fourth cycle appearing between a GCD range of 9–12 mm, at this transitional stage the S4 being quite rudimentary, seen only deep within the corallum. Even in mature coralla, the S4 are small, terminating several mm below the calicular edge. S1 are highly exsert (up to 6.4 mm), and have sinuous axial edges that come close to meeting in the center of the calice, defining a deep and narrow central fossa. The S2 are slightly less exsert (up to 2.2 mm) and less wide than the S1. The S3 are less exsert (up to 0.8 mm) and slightly less wide than the S2. As mentioned, the S4 are small to rudimentary, not attaining the calicular edge and thus not exsert. The lower axial edges of the S1–3 are sinuous, and the septal faces adjacent to the axial edges bear elongate obliquely oriented ridges.

Remarks. Cairns (2004) listed and keyed the ten Recent species of *Javania*. In this key, *J. cristata* is most similar to *J. exserta* Cairns, 1999, but can be distinguished by its narrower pedicel diameter, sinuous axial septal edges, and less exsert septa. Furthermore, *J. exserta* is known only from the western Pacific at much shallower depths (91–291 m). *Javania cristata* is also similar to *J. cailleti*, especially forma *nobile* as described by Verrill (1885), but differs in having S1 larger than their S2 and in having extremely sinuous axial septal edges.

Distribution. Continental slope off central Argentina, and Burdwood Bank (Fig. 19), 461–1647 m.

Material/Types. Holotype: PAT0209DR11, USNM 1193329. Paratypes: PAT0108DR1, 10, MNCN; PAT0108DR7, 8, MNCN; PAT 0108DR11, 1, MNCN; PAT0108DR15, 1, MNCN; PAT1008DR1, 10, MNCN 2.04/1100; PAT1008DR4, 2, MNCN; PAT1008DR5, 1, MNCN; PAT1008DR9, 13, MNCN; PAT1008DR10, 9, MNCN 2.04/1098, and 1, USNM 1193327; PAT1008DR12, 6, MNCN; PAT1008DR13, 3, MNCN; PAT0108DR14, 2, MNCN; PAT1008BC24, 3, USNM 1193330; PAT1108DR3, 3, MNCN; PAT1108DR4, 2, MNCN; PAT1108DR5, 2, MNCN; PAT1108DR9, 1, MNCN; PAT1108DR10, 1, MNCN; PAT1108DR11, 1, MNCN; PAT1208DR1, 11, MNCN 2.04/1101; PAT1208DR7, 1, MNCN; PAT1208DR9, 6, MNCN; PAT1208DR11, 2, MNCN; PAT1208DR16, 1, MNCN; PAT0209DR3, 2, MNCN; PAT0209DR5, 3, MNCN; PAT0209DR8,2, MNCN; PAT0209DR14, 3, MNCN; PAT0209DR16, 3, MNCN, and 2, USNM 1193326; PAT0210DR7, 2, MNCN 2.04/1099; PAT0210DR8, 1, MNCN ; PAT0210DR9, 1, MNCN 2.04/1102; ATL09Lo59, 2, USNM 1193328; *Eltanin* 1592, 1, USNM 47530.

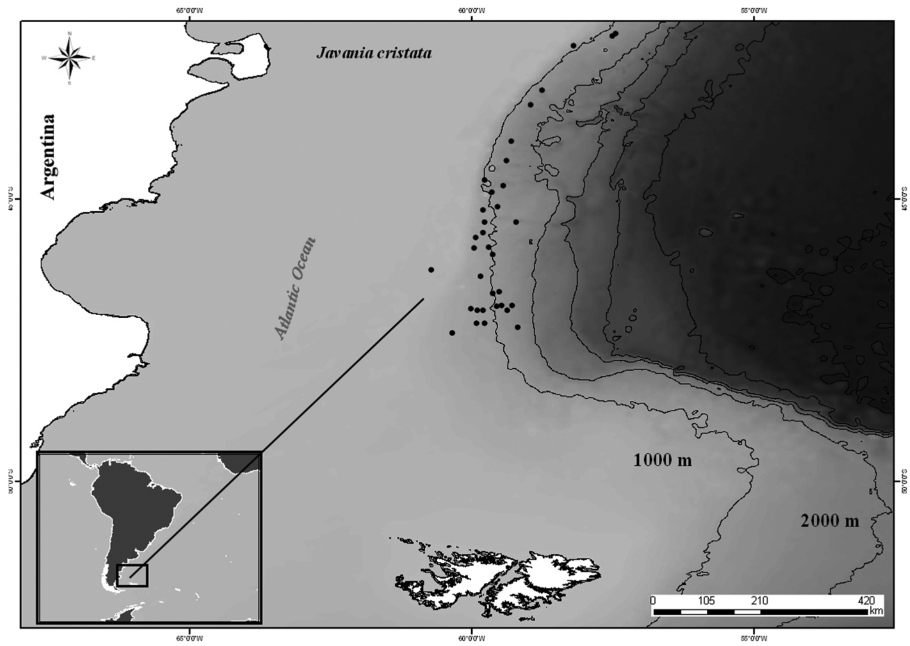

FIGURE 19. Distribution of *Javania cristata*.

Type locality. 43.981°S, 59.291°W (off Punta Clara, Argentina), 1500 m.

Etymology. From the Latin *cristatus* (meaning crested, ridged), an allusion to the prominently ridged C1–2.

Acknowledgements

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APPENDIX.

Expedition	Code_trawl	Latitude (S)	Lenght (w)	Depth (m)	Date
Atlantis 08	ATL08LO03	-45.1080	-60.2404	117	15/03/2008
Atlantis 08	ATL08LO103	-45.4079	-60.0141	468	02/04/2008
Atlantis 08	ATL08LO104	-45.4386	-59.4497	855	02/04/2008
Atlantis 08	ATL08LO107	-45.1754	-59.4706	781	02/04/2008
Atlantis 08	ATL08LO108	-45.3099	-59.4532	799	03/04/2008
Atlantis 08	ATL08LO111	-45.2761	-59.1237	1347	03/04/2008
Atlantis 08	ATL08LO114	-45.4522	-59.1788	1334	04/04/2008
Atlantis 08	ATL08LO124	-44.4902	-59.3161	1309	06/04/2008
Atlantis 08	ATL08LO129	-45.4561	-59.3162	1115	09/04/2008
Atlantis 08	ATL08LO130	-45.4836	-59.2855	1174	09/04/2008
Atlantis 08	ATL08LO132	-45.2661	-59.2156	1234	10/04/2008
Atlantis 08	ATL08LO136	-44.1453	-59.2313	1356	11/04/2008
Atlantis 08	ATL08LO14	-45.0649	-59.5186	734	17/03/2008
Atlantis 08	ATL08LO17	-45.2919	-60.0086	411	17/03/2008
Atlantis 08	ATL08LO48	-47.3315	-60.4030	420	23/03/2008
Atlantis 08	ATL08LO54	-47.3145	-60.1269	612	24/03/2008
Atlantis 08	ATL08LO56	-47.1796	-60.1562	607	24/03/2008
Atlantis 08	ATL08LO57	-47.1937	-60.2482	542	24/03/2008
Atlantis 08	ATL08LO62	-47.4260	-59.4526	750	25/03/2008
Atlantis 08	ATL08LO68	-47.2958	-59.1478	1287	26/03/2008
Atlantis 08	ATL08LO72	-47.1396	-60.1011	649	27/03/2008
Atlantis 08	ATL08LO75	-47.0968	-59.5132	817	27/03/2008
Atlantis 08	ATL08LO78	-46.5325	-59.4819	884	28/03/2008
Atlantis 08	ATL08LO86	-46.2974	-60.1347	484	30/03/2008
Atlantis 08	ATL08LO97	-46.0141	-59.4501	863	01/04/2008
Atlantis 09	ATL09LO07	-45.2646	-60.0123	355	03/03/2009
Atlantis 09	ATL09LO08	-45.2939	-59.5581	719	03/03/2009

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APPENDIX. (Continued.)

Expedition	Code_trawl	Latitude (S)	Lenght (w)	Depth (m)	Date
Atlantis 09	ATL09LO09	-45.3068	-59.4826	812	03/03/2009
Atlantis 09	ATL09LO10	-45.2082	-60.2824	108	04/03/2009
Atlantis 09	ATL09LO100	-45.3077	-59.0619	1395	20/03/2009
Atlantis 09	ATL09LO101	-45.2901	-59.1240	1344	20/03/2009
Atlantis 09	ATL09LO102	-45.2996	-59.2881	1106	20/03/2009
Atlantis 09	ATL09LO103	-45.2998	-59.4364	857	20/03/2009
Atlantis 09	ATL09LO107	-45.1545	-59.3324	1047	21/03/2009
Atlantis 09	ATL09LO112	-45.0143	-59.2753	1262	22/03/2009
Atlantis 09	ATL09LO113	-44.5855	-59.3802	1174	22/03/2009
Atlantis 09	ATL09LO117	-44.5283	-59.3119	1341	23/03/2009
Atlantis 09	ATL09LO118	-44.5598	-59.3600	1232	23/03/2009
Atlantis 09	ATL09LO14	-45.3688	-60.0085	477	04/03/2009
Atlantis 09	ATL09LO15	-45.3823	-59.5355	791	04/03/2009
Atlantis 09	ATL09LO45	-46.2902	-60.2950	152	09/03/2009
Atlantis 09	ATL09LO52	-47.0752	-60.3610	429	10/03/2009
Atlantis 09	ATL09LO53	-46.5704	-60.4208	268	11/03/2009
Atlantis 09	ATL09LO56	-47.0230	-60.1432	619	11/03/2009
Atlantis 09	ATL09LO57	-47.1104	-60.1446	613	11/03/2009
Atlantis 09	ATL09LO58	-47.1618	-60.1863	585	11/03/2009
Atlantis 09	ATL09LO59	-47.3676	-60.3394	461	12/03/2009
Atlantis 09	ATL09LO60	-47.2418	-60.4399	393	12/03/2009
Atlantis 09	ATL09LO61	-47.2063	-60.3830	432	12/03/2009
Atlantis 09	ATL09LO63	-47.2342	-60.2089	567	12/03/2009
Atlantis 09	ATL09LO65	-47.4037	-60.1145	596	13/03/2009
Atlantis 09	ATL09LO66	-47.4288	-60.0309	655	13/03/2009
Atlantis 09	ATL09LO67	-47.4104	-59.5014	733	13/03/2009
Atlantis 09	ATL09LO69	-47.2799	-59.4900	785	13/03/2009
Atlantis 09	ATL09LO70	-47.2297	-60.0009	722	14/03/2009
Atlantis 09	ATL09LO71	-47.1923	-59.5412	773	14/03/2009
Atlantis 09	ATL09LO72	-47.1425	-60.0024	739	14/03/2009
Atlantis 09	ATL09LO73	-47.1305	-60.0469	699	14/03/2009
Atlantis 09	ATL09LO74	-47.4531	-59.3899	781	15/03/2009
Atlantis 09	ATL09LO77	-47.2295	-59.4018	883	15/03/2009
Atlantis 09	ATL09LO79	-47.0721	-59.4781	849	15/03/2009
Atlantis 09	ATL09LO80	-46.4700	-60.1862	523	16/03/2009
Atlantis 09	ATL09LO81	-46.5411	-60.0922	648	16/03/2009
Atlantis 09	ATL09LO83	-46.5520	-59.4859	884	16/03/2009
Atlantis 09	ATL09LO84	-47.0419	-59.5468	788	16/03/2009
Atlantis 09	ATL09LO86	-46.2685	-59.3712	887	17/03/2009
Atlantis 09	ATL09LO91	-46.3707	-59.4689	785	18/03/2009
Atlantis 09	ATL09LO92	-46.1377	-59.4148	849	18/03/2009
Atlantis 09	ATL09LO93	-46.0698	-59.4150	856	18/03/2009

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APPENDIX. (Continued.)

Expedition	Code_trawl	Latitude (S)	Lenght (w)	Depth (m)	Date
Atlantis 09	ATL09LO95	-45.5510	-59.2614	1210	19/03/2009
Atlantis 09	ATL09LO96	-45.5011	-59.2910	1183	19/03/2009
Atlantis 09	ATL09LO98	-45.4319	-59.3193	1105	19/03/2009
Atlantis 10	ATL10LO02	-45.1452	-60.1768	107	09/03/2010
Atlantis 10	ATL10LO03	-45.1179	-60.0562	124	09/03/2010
Atlantis 10	ATL10LO04	-45.0429	-59.5937	287	09/03/2010
Atlantis 10	ATL10LO07	-45.1637	-60.1861	111	10/03/2010
Atlantis 10	ATL10LO23	-46.0235	-60.2220	139	15/03/2010
Atlantis 10	ATL10LO32	-46.1347	-60.2745	144	17/03/2010
Atlantis 10	ATL10LO33	-46.0975	-60.3429	136	17/03/2010
Atlantis 10	ATL10LO34	-46.4467	-60.1528	568	18/03/2010
Atlantis 10	ATL10LO51	-47.1332	-60.3878	411	22/03/2010
Atlantis 10	ATL10LO53	-47.3340	-60.4393	389	22/03/2010
Atlantis 10	ATL10LO59	-47.3796	-60.2199	528	24/03/2010
Atlantis 10	ATL10LO60	-47.3630	-60.0893	622	24/03/2010
Atlantis 10	ATL10LO64	-47.4341	-59.3932	788	25/03/2010
Atlantis 10	ATL10LO79	-46.2506	-59.5288	722	29/03/2010
Atlantis 10	ATL10LO87	-45.4395	-59.4427	865	01/04/2010
Atlantis 10	ATL10LO89	-45.3527	-59.5529	771	01/04/2010
Atlantis 10	ATL10LO94	-45.0680	-59.5019	776	02/04/2010
Patagonia 0108	PAT0108DR01	-46.6645	-59.6244	906	12/01/2008
Patagonia 0108	PAT0108DR02	-46.6966	-59.5164	1021	13/01/2008
Patagonia 0108	PAT0108DR03	-46.7088	-59.4982	1081	14/01/2008
Patagonia 0108	PAT0108DR07	-46.3653	-59.8385	782	17/01/2008
Patagonia 0108	PAT0108DR08	-45.5040	-59.8661	818	19/01/2008
Patagonia 0108	PAT0108DR11	-45.4122	-59.7606	967	21/01/2008
Patagonia 0108	PAT0108DR12	-45.1788	-59.8889	767	23/01/2008
Patagonia 0108	PAT0108DR14	-45.1349	-59.5299	1180	25/01/2008
Patagonia 0108	PAT0108DR15	-45.4136	-59.2056	1626	26/01/2008
Patagonia 0108	PAT0108DR16	-45.0774	-59.4210	1526	27/01/2008
Patagonia 0108	PAT0108DR17	-45.4634	-58.8836	1881	28/01/2008
Patagonia 0209	PAT0209BC27	-43.2858	-59.1038	1500	18/02/2009
Patagonia 0209	PAT0209BC34	-42.8333	-58.5877	997	20/02/2009
Patagonia 0209	PAT0209BC7	-44.6569	-59.3163	1492	07/02/2009
Patagonia 0209	PAT0209DR01	-43.9169	-59.3010	1393	05/02/2009
Patagonia 0209	PAT0209DR02	-44.7319	-59.6079	1248	06/02/2009
Patagonia 0209	PAT0209DR03	-44.7688	-59.4377	1513	07/02/2009
Patagonia 0209	PAT0209DR04	-44.7511	-59.2668	1577	08/02/2009
Patagonia 0209	PAT0209DR05	-44.6555	-59.7559	991	09/02/2009
Patagonia 0209	PAT0209DR07	-44.7432	-59.3215	1620	12/02/2009
Patagonia 0209	PAT0209DR08	-44.3191	-59.3728	1478	13/02/2009
Patagonia 0209	PAT0209DR09	-44.1399	-59.3834	1629	14/02/2009

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APPENDIX. (Continued.)

Expedition	Code_trawl	Latitude (S)	Lenght (w)	Depth (m)	Date
Patagonia 0209	PAT0209DR10	-44.1677	-59.1830	1581	15/02/2009
Patagonia 0209	PAT0209DR11	-43.9813	-59.2905	1500	16/02/2009
Patagonia 0209	PAT0209DR12	-43.6760	-59.1016	1635	17/02/2009
Patagonia 0209	PAT0209DR14	-43.3294	-58.9400	1553	18/02/2009
Patagonia 0209	PAT0209DR15	-43.2849	-59.0009	1244	19/02/2009
Patagonia 0209	PAT0209DR16	-43.0663	-58.7438	1529	20/02/2009
Patagonia 0210	PAT0210BC19	-42.1616	-57.5877	587	25/02/2010
Patagonia 0210	PAT0210DR04	-41.5930	-57.5817	436	20/02/2010
Patagonia 0210	PAT0210DR05	-42.0016	-57.5547	586	21/02/2010
Patagonia 0210	PAT0210DR06	-42.0122	-57.5687	485	23/02/2010
Patagonia 0210	PAT0210DR07	-42.2811	-58.1864	1096	25/02/2010
Patagonia 0210	PAT0210DR08	-42.1153	-57.4988	1090	26/02/2010
Patagonia 0210	PAT0210DR09	-42.0691	-57.4416	1048	27/02/2010
Patagonia 0210	PAT0210DR10	-42.1199	-57.3361	1408	28/02/2010
Patagonia 0210	PAT0210DR11	-42.1210	-57.4663	1148	28/02/2010
Patagonia 1008	PAT1008BC24	-46.8786	-59.2797	1563	28/10/2008
Patagonia 1008	PAT1008DR01	-46.9357	-60.0104	817	21/10/2008
Patagonia 1008	PAT1008DR03	-46.9547	-59.9514	798	23/10/2008
Patagonia 1008	PAT1008DR04	-46.9741	-59.8934	863	26/10/2008
Patagonia 1008	PAT1008DR05	-46.9686	-59.7936	944	28/10/2008
Patagonia 1008	PAT1008DR06	-47.2833	-59.9611	757	29/10/2008
Patagonia 1008	PAT1008DR08	-47.1926	-59.9420	779	30/10/2008
Patagonia 1008	PAT1008DR09	-47.1925	-59.8992	844	31/10/2008
Patagonia 1008	PAT1008DR10	-47.1933	-59.7577	934	01/11/2008
Patagonia 1008	PAT1008DR11	-47.1715	-59.6524	1014	02/11/2008
Patagonia 1008	PAT1008DR12	-46.9001	-59.5514	1241	03/11/2008
Patagonia 1008	PAT1008DR13	-46.8854	-59.4645	1185	04/11/2008
Patagonia 1108	PAT1108BC14	-47.5863	-59.0600	1062	18/11/2008
Patagonia 1108	PAT1108DR01	-44.8898	-60.0282	650	09/11/2008
Patagonia 1108	PAT1108DR02	-44.9085	-59.9196	659	10/11/2008
Patagonia 1108	PAT1108DR03	-46.6396	-59.5065	1062	11/11/2008
Patagonia 1108	PAT1108DR04	-46.9620	-59.3636	1242	13/11/2008
Patagonia 1108	PAT1108DR05	-47.2739	-59.1805	1399	14/11/2008
Patagonia 1108	PAT1108DR08	-46.5606	-60.8150	145	17/11/2008
Patagonia 1108	PAT1108DR09	-45.1904	-59.7950	941	18/11/2008
Patagonia 1108	PAT1108DR10	-45.5983	-59.7898	1051	19/11/2008
Patagonia 1108	PAT1108DR10R	-45.6058	-59.7734	1232	19/11/2008
Patagonia 1108	PAT1108DR11	-44.8721	-59.6354	1248	20/11/2008
Patagonia 1208	PAT1208DR01	-46.2593	-60.7141	825	02/12/2008
Patagonia 1208	PAT1208DR02	-46.1454	-60.2788	846	03/12/2008
Patagonia 1208	PAT1208DR04	-45.8270	-59.7998	973	04/12/2008
Patagonia 1208	PAT1208DR05	-45.6548	-59.6645	1263	05/12/2008

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APPENDIX. (Continued.)

Expedition	Code_trawl	Latitude (S)	Lenght (w)	Depth (m)	Date
Patagonia 1208	PAT1208DR06	-46.0271	-59.9399	748	06/12/2008
Patagonia 1208	PAT1208DR07	-45.6824	-59.9275	839	07/12/2008
Patagonia 1208	PAT1208DR09	-45.8556	-59.6888	1038	08/12/2008
Patagonia 1208	PAT1208DR10	-46.1152	-59.5710	959	09/12/2008
Patagonia 1208	PAT1208DR11	-45.9750	-59.6194	1088	10/12/2008
Patagonia 1208	PAT1208DR14	-45.9642	-59.7981	854	13/12/2008
Patagonia 1208	PAT1208DR16	-45.8611	-59.9513	761	15/12/2008
Patagonia 1208	PAT1208DR17	-46.2173	-60.3088	158	16/12/2008
Patagonia 1208	PAT1208DR18	-45.7632	-60.1046	301	17/12/2008
VEMA 15-121	VEMA15-121	-56.6536	-66.8788	1161	01/03/1959
WH197/71	WH197/71	-48.2166	-60.1666	500	19/01/1971
WH311/66	WH311/66	-47.0166	-60.7166	310	25/06/1966
WH328/71	WH328/71	-42.8666	-58.6333	1200	22/02/1971
WH336766	WH336/66	-51.5666	-56.4166	600	30/06/1966
Eltanin 1592	Eltanin 1592	-54.7166	-55.5000	1846	14/03/1966