Species of *Acryptolaria* Norman, 1875 (Cnidaria, Hydrozoa, Lafoeidae) collected in the Western Pacific by various French expeditions, with the description of nineteen new species

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ABSTRACT
The species of *Acryptolaria* present in collections from several French expeditions in the western Pacific, mostly in the waters around New Caledonia and neighbouring areas, have been studied. The collection proved to be rich in biodiversity, since 29 species were found, of which 19 new to science, doubling the number of known species in this genus. All the species are described, including measurements, and figured. The unknown coppiniae of several previously described species have been found; these are also described and figured. The study confirmed the key role of the cnidome for species identification.

KEY WORDS
Cnidaria,
Hydrozoa,
Lafoeidae,
Acryptolaria,
deep-water,
New Caledonia,
Western Pacific,
new species.

ABSTRACT
Acryptolaria *Norman, 1875 (Cnidaria, Hydrozoa, Lafoeidae) récoltés dans le Pacifique occidental par diverses expéditions françaises, et description de dix-neuf espèces nouvelles.*
Les espèces d'*Acryptolaria* présentes dans les récoltes de plusieurs expéditions françaises dans le Pacifique occidental, principalement dans la région néo-calédonienne, ont été étudiées. Il s'avère que cet échantillon est d'une biodiversité importante ; en effet 29 espèces ont été trouvées dont 19 sont nouvelles pour la science. Ceci double le nombre d'espèces connues dans ce genre. Toutes les espèces sont décrites et illustrées, et leurs mensurations sont indiquées. Les coppiniae inconnus de plusieurs espèces déjà décrites ont été trouvés ; ils sont décrits et illustrés. Cette étude confirme le rôle-clé du cnidome dans l'identification des espèces.

MOTS CLÉS
Cnidaria,
Hydrozoa,
Lafoeidae,
Acryptolaria,
eaux profondes,
Nouvelle-Calédonie,
Pacifique occidental,
espèces nouvelles.

INTRODUCTION

The present study deals with the species of *Acryptolaria* Norman, 1875 present in the huge hydroid collection resulting from several French expeditions in the western Pacific, mostly in the New Caledonian area; a few samples are from the Philippines area. This genus appears to be extremely diverse in this area. According to Peña Cantero *et al.* (2007) there are 16 known species of *Acryptolaria* in the world. We found a total of 29 species, 19 of which are considered new to science, thus doubling the number of known species to 35.

Formerly identification of the species of *Acryptolaria* proved to be a difficult task. Although the genus can be easily recognized amongst benthic Hydrozoa, both paucity of characters for species differentiation and poor original descriptions of many nomimal species made identifications at the species level almost impossible. To alleviate this situation, Peña Cantero *et al.* (2007) carried out a revision of the genus, redescribing most of the known species, based on the study of their type specimens, including new figures and information concerning the cnidome, which resulted in a useful tool for species identification.

Peña Cantero *et al.* (2007) also realised that it was impossible to confirm many of the previous identifications, unless the voucher specimens could be studied, because of the lack of cnidome information and, in general, the poor descriptions and figures. In spite of this, they considered all those records in a final appendix to stimulate future studies of the genus *Acryptolaria*.

MATERIAL AND METHODS

Information concerning the species examined and collecting stations has been summarized in Table 1. The bathymetric range of the samples studied is between depths of 92 and 1470 m; most samples are from bathyal depths.

The material was examined, measured and drawn with a compound microscope and a stereomicroscope. Measurements of nematocysts were made on undischarged capsules. As in Peña Cantero *et al.* (2007), only records based on data with enough characteristics to be recognized from literature have been included.

Holotypes and much of the remaining material is preserved in the collections of the Muséum national d'Histoire naturelle, Paris (MNHN). Additional material, including paratypes, is in the National Museum of Natural History, Leiden (RMNH) and in the Museo de Ciencias Naturales of Madrid (MNCN). The collection numbers are given in the paragraph Material examined of the species descriptions.

SYSTEMATICS

Family LAFOEIDAE Hincks, 1868

Genus *Acryptolaria* Norman, 1875

Acryptolaria Norman, 1875: 172, pl. 12 figs 1, 2.

Scapus Norman, 1875: 173, pl. 12 figs 1, 3 (type species: *Scapus tubulifer* Norman, 1875).

Oswaldaria Stechow, 1921: 30 (type species: *Cryptolaria crassicaulis* Allman, 1888).

TYPE SPECIES. — *Acryptolaria andersoni* Totton, 1930.

DIAGNOSIS. — Lafoeidae with adult colonies consisting of branched, polysiphonic, erect stems with a main, hydrothecate central axial tube and a series of accompanying accessory tubes. Branches also polysiphonic, originating from secondary tubes. Polysiphony decreasing distally, but almost reaching distal end. Hydrothecae only present on main axis of stem and branches. Hydrothecae alternately arranged, forming two longitudinal rows (with the exception of *A. tetraseriata* n. sp.), usually in one plane. Hydrotheca tubiform, partially adnate to branch; without diaphragm. Nematothecae absent. Gonothecae aggregated to form a coppinia, with or without defensive tubes. Gonophores fixed sporosacs. Cnidome consisting of two categories of nematocysts: large putative macrobasic mastigophores and small putative microbasic mastigophores.

REMARKS

For a wider discussion on the genus see Peña Cantero *et al.* (2007). These authors completely redescribed the type specimens of the known species, with the exception of *A. andersoni* and *A. rectangularis*

(Jarvis, 1922), for which no type material could be located; it is probably lost. According to Peña Cantero *et al.* (2007) the genus after their revision included 16 valid species. However, *A. andersoni*, type species of the genus, and *A. rectangularis* are insufficiently known, although the coppinia of the former, that was mistakenly described as a new species of hydroid (*Scapus tubulifer* Norman, 1875), is known.

Species included

A list of species originally referred to *Acryptolaria* is given by Peña Cantero *et al.* (2007); they also list the species that actually belong to other genera of Lafoeidae, as *Cryptolaria*, *Grammaria* or *Zygophylax*.

Below we list all presently known species of *Acryptolaria* (in bold those found in the present study):
Acryptolaria abies (Allman, 1877)
Acryptolaria andersoni Totton, 1930
Acryptolaria angulata (Bale, 1914)
Acryptolaria bathyalis n. sp.
Acryptolaria bulbosa (Stechow, 1932)
Acryptolaria conferta (Allman, 1877)
Acryptolaria corniformis Naumov & Stepanjants, 1962
Acryptolaria crassicaulis (Allman, 1888)
Acryptolaria disordinata n. sp.
Acryptolaria encarnae n. sp.
Acryptolaria flabelloides n. sp.
Acryptolaria flabellum (Allman, 1888)
Acryptolaria gemini n. sp.
Acryptolaria gracilis (Allman, 1888)
Acryptolaria infinita n. sp.
Acryptolaria intermedia n. sp.
Acryptolaria inversa n. sp.
Acryptolaria laertesi n. sp.
Acryptolaria longitheca (Allman, 1877)
Acryptolaria medeae n. sp.
Acryptolaria minima Totton, 1930
Acryptolaria minuta Watson, 2003
Acryptolaria niobae n. sp.
Acryptolaria norfolkensis n. sp.
Acryptolaria novaecaledoniae n. sp.
Acryptolaria operculata Stepanjants, 1979
Acryptolaria profunda n. sp.
Acryptolaria pseudoangulata n. sp.
Acryptolaria pseudoundulata n. sp.
Acryptolaria pulchella (Allman, 1888)
Acryptolaria pygmaea n. sp.
Acryptolaria rectangularis (Jarvis, 1922)
Acryptolaria tetraseriata n. sp.
Acryptolaria tortugasensis Leloup, 1935
Acryptolaria undulata n. sp.

DESCRIPTION OF THE SPECIES

Acryptolaria angulata (Bale, 1914)
(Figs 1; 30; 31A; Table 2)

Cryptolaria angulata Bale, 1914: 166, 167, pl. 35, fig. 1; 1915: 251. — Stranks 1993: 7.

Acryptolaria angulata – Schuchert 2003: 155, 156, fig. 14. — Peña Cantero *et al.* 2007: 235-237, figs 2, 17B; tab. II.

Not *Acryptolaria angulata* – Vervoort 1966: 116, 117, fig. 16 [= ?*A. rectangularis* (Jarvis, 1922)]

Not *Acryptolaria angulata* – Hirohito 1995: 102, text-fig. 29a, b, pl. 6 fig. B [= ?*A. bulbosa* (Stechow, 1932)]

Material examined. — **Loyalty Islands.** BIOCAL 1, stn CP 84, 20°43.498'-20°42.948'S, 167°00.278'-167°01.500'E, 210-150 m, 6.IX.1985, 5 stems up to 40 mm high with coppinia (MNHN-Hy.2009-0176); 2 slides (MNHN-Hy.2009-0144 & RMNH-Coel. no. 37468, slide 288 with fragments up to 17 mm long).
BIOGEOCAL, stn DW 292, 20°28.23'-20°28.18'S, 166°48.45'-166°48.48'E, 470-465 m, 27.IV.1987, a few stems up to 12 mm high (slide MNHN-Hy.2009-0145).
MUSORSTOM 6, stn DW 399, 20°41.80'S, 167°00.20'E, 282 m, 14.II.1989, 1 stem *c.* 30 mm high (RMNH-Coel. no. 31494); 1 stem *c.* 23 mm high (RMNH-Coel. no. 35101, slide 662). — Stn DW 474, 21°08.80'S, 167°55.50'E, 260 m, 22.II.1989, 5 stems up to 20 mm high (MNHN-Hy.2009-0177). — Stn DW 487, 21°23.30'S, 167°46.40'E, 500 m, 23.II.1989, several stems up to 25 mm high, on coral (MNHN-Hy.2009-0178); 1 stem *c.* 33 mm high in slide (MNHN-Hy.2009-0146). — Stn DW 489, 20°48.37'S, 167°05.86'E, 700 m, 24.II.1989, 1 stem *c.* 62 mm high, with coppinia (MNCN 2.03/402).
Norfolk Ridge. BIOCAL 1, stn DW 36, 23°08.647'-23°08.900'S, 167°10.994'-167°11.296'E, 650-680 m, 29.VIII.1985, 3 stems up to 12 mm high, on coral (RMNH-Coel. no 31495). — Stn DW 44, 22°47.300'-22°47.350'S, 167°14.300'-167°14.500'E, 440-450 m, 30.VIII.1985, 1 fragment *c.* 10 mm long, with coppinia (RMNH-Coel. no. 31496). — Stn DW 51, 23°05.273'-23°05.432'S, 167°44.951'-167°45.355'E, 700-680 m, 31.VIII.1985, 5 stems up to 10 mm high (MNCN 2.03/403). — Stn DW 66, 24°55.435'-24°54.849'S, 168°21.678'-168°21.995'E, 515-505 m, 3.IX.1985, 3 stems up to 37 mm high, with coppinia (MNCN 2.03/404). — Stn DW 70, 23°24.700'-23°25.650'S, 167°53.650'-167°52.700'E, 965 m, 4.IX.1985, 1 stem *c.* 30 mm high, with coppinia (MNHN-Hy.2009-0179).
SMIB 4, stn DW 37, 24°54.5'-24°53.9'S, 168°22.3'-

TABLE 1. — List of stations and species of *Acryptolaria* Norman, 1875 collected. Abbreviations: ***Aang***, *Acryptolaria angulata* (Bale, 1914); ***Abat***, *A. bathyalis* n. sp.; ***Abul***, *A. bulbosa* (Stechow, 1932); ***Acon***, *A.* cf. *conferta* (Allman, 1877); ***Acor***, *A.* cf. *corniformis* Naumov & Stepanjants, 1962; ***Acra***, *A. crassicaulis* (Allman, 1888); ***Adis***, *A. disordinata* n. sp.; ***Aenc***, *A. encarnae* n. sp.; ***Afla***, *A. flabelloides* n. sp.; ***Agem***, *A. gemini* n. sp.; ***Ainf***, *A. infinita* n. sp.; ***Aint***, *A. intermedia* n. sp.; ***Ainv***, *A. inversa* n. sp.; ***Alae***, *A. laertesi* n. sp.; ***Alon***, *A. longitheca* (Allman, 1877); ***Amed***, *A. medeae* n. sp.; ***Amini***, *A.* cf. *minima* Totton, 1930; ***Aminu***, *A. minuta* Watson, 2003; ***Anio***, *A. niobae* n. sp.; ***Anor***, *A. norfolkensis* n. sp.; ***Anov***, *A. novaecaledoniae* n. sp.; ***Aope***, *A.* cf. *operculata* Stepanjants, 1979; ***Apro***, *A. profunda* n. sp.; ***Apsa***, *A. pseudoangulata* n. sp.; ***Apsu***, *A. pseudoundulata* n. sp.; ***Apul***, *A. pulchella* (Allman, 1888); ***Apyg***, *A. pygmaea* n. sp.; ***Atet***, *A. tetraseriata* n. sp.; ***Aund***, *A. undulata* n. sp. Sampling gear: **CP**, beam trawl; **DR**, rectangular dredge; **DW**, Warén dredge.

Locality	Cruise	Station	Coordinates	Depth (m)	Date	Species collected
Philippines	MUSORSTOM 3	DR 117	12°31.2'-12°31.3'N, 120°39.3'-120°39.5'E	92-97	3.VI.1985	*Abul*; *Apul*; *Atet*
		CP 131	11°36.6'S, 121°43.10'E	111-113	5.VI.1985	*Apul*
New Caledonia	"Drague 3"		unknown	unknown	23.V.?	*Ainv*
	BIOCAL 1	CP 75	22°18.650'-22°20.429'S, 167°23.302'-167°23.416'E	825-860	4-5.IX.1985	*Acon*
NW New Caledonia	MUSORSTOM 4	DW 162	18°35.0'S, 163°10.3'E	525	16.IX.1985	*Ainf*
		CP 172	19°1.2'S, 163°16.0'E	275-330	17.IX.1985	*Acra*
		CP 180	18°56.8'S, 163°17.7'E	450	18.IX.1985	*Apsa*
		CP 194	18°52.8'S, 163°21.7'E	550	19.IX.1985	*Adis*; *Apsa*
		CP 195	18°54.8'S, 163°22.2'E	465	19.IX.1985	*Adis*; *Amed*
		DW 197	18°51.3'S, 163°21.0'E	560	20.IX.1085	*Adis*; *Ainf*; *Amed*
SE New Caledonia	MUSORSTOM 4	CP 237	22°12.0'S, 167°16.5'E	630	2.X.1985	*Abat*
Loyalty Islands	BIOCAL 1	DW 08	20°34.351'-20°35.092'S, 166°53.904'-166°54.051'E	435	12.VIII.1985	*Abul*; *Acra*; *Anio*
		DW 82	20°30.658'-20°30.888'S, 167°50.308'-167°50.367'E	440-460	6.IX.1985	*Abat*; *Alon*
		CP 84	20°43.498'-20°42.948'S, 167°00.278'-167°01.500'E	210-150	6.IX.1985	*Aang*
	BIOGEOCAL	CP 290	20°36.01'-20°37.26'S, 167°03.34'-167°03.60'E	920-760	27.IV.1987	*Afla*; *Anio*
		DW 292	20°28.23'-20°28.18'S, 166°48.45'-166°48.48'E	470-465	27.IV.1987	*Aang*
		CP 297	20°38.64'-20°38.67'S, 167°10.77'-167°11.07'E	1230-1240	28.IV.1987	*Apsa*
		DW 307	20°35.38'-20°35.32'S, 166°55.25'-166°55.33'E	470-480	1.V.1987	*Acra*; *Apsa*
	MUSORSTOM 6	DW 391	20°47.35'S, 167°05.70'E	390	13.II.1989	*Ainv*
		DW 397	20°47.35'S, 167°05.17'E	380	13.II.1989	*Abul*
		DW 398	20°47.19'S, 167°05.65'E	370	13.II.1989	*Ainv*; *Anov*
		DW 399	20°41.80'S, 167°00.20'E	282	14.II.1989	*Aang*; *Acor*; *Ainv*
		DW 406	20°40.65'S, 167°06.80'E	373	15.II.1989	*Abul*; *Alon*; *Aminu*
		DW 407	20°40.70'S, 167°06.60'E	360	15.II.1989	*Alon*
		CP 415	20°40.20'S, 167°03.95'E	461	15.II.1989	*Abat*
		CP 419	20°41.65'S, 167°03.70'E	283	16.II.1989	*Abat*; *Abul*
		DW 422	20°26.20'S, 166°40.31'E	257	16.II.1989	*Ainv*; *Alon*; *Anov*; *Apro*
		DW 423	20°25.85'S, 166°40.50'E	280	16.II.1989	*Ainv*
		DW 424	20°24.30'S, 166°24.70'E	599	17.II.1989	*Ainv*
		DW 425	20°24.30'S, 166°24.80'E	594	17.II.1989	*Alae*
		DW 457	21°00.42'S, 167°28.71'E	353	20.II.1989	*Apsu*
		CP 464	21°02.30'S, 167°31.60'E	430	21.II.1989	*Abat*; *Aenc*; *Ainv*; *Alon*
		DW 471	21°08.00'S, 167°54.10'E	460	22.II.1989	*Alon*
		DW 473	21°08.80'S, 167°55.30'E	236	22.II.1989	*Acra*
		DW 474	21°08.80'S, 167°55.50'E	260	22.II.1989	*Aang*
		DW 476	21°09.36'S, 167°56.40'E	300	22.II.1989	*Ainv*
		DW 477	21°07.98'S, 167°54.69'E	550	22.II.1989	*Ainv*

TABLE 1. — Continuation.

Locality	Cruise	Station	Coordinates	Depth (m)	Date	Species collected
		DW 481	21°21.85'S, 167°50.30'E	300	23.II.1989	*Aminu*
		DW 487	21°23.30'S, 167°46.40'E	500	23.II.1989	*Aang*
		DW 489	20°48.37'S, 167°05.86'E	700	24.II.1989	*Aang*; *Acon*
Norfolk Ridge	BIOCAL 1	DW 36	23°08.647'-23°08.900'S, 167°10.994'-167°11.296'E	650-680	29.VIII.1985	*Aang*; *Amini*; *Anor*; *Apsa*
		DW 37	22°59.990'-23°00.079'S, 167°15.650'-167°16.340'E	350	30.VIII.1985	*Aminu*
		DW 44	22°47.300'-22°47.350'S, 167°14.300'-167°14.500'E	440-450	30.VIII.1985	*Aang*
		DW 51	23°05.273'-23°05.432'S, 167°44.951'-167°45.355'E	700-680	31.VIII.1985	*Aang*; *Amini*
		DW 66	24°55.435'-24°54.849'S, 168°21.678'-168°21.995'E	515-505	3.IX.1985	*Aang*; *Aenc*; *Afla*; *Alon*; *Anio*; *Apsa*; *Aund*
		CP 67	24°55.443'-24°54.176'S, 168°21.550'-168°21.978'E	500-510	3.IX.1985	*Afla*; *Aund*
		CP 68	24°00.374'-24°01.383'S, 168°07.031'-168°06.579'E	1430-1470	3.IX.1985	*Afla*
		DW 70	23°24.700'-23°25.650'S, 167°53.650'-167°52.700'E	965	4.IX.1985	*Aang*; *Aope*; *Apsa*
	CHALCAL 2	DW 76	23°40.50'S, 167°45.20'E	470	30.X.1986	*Abul*; *Aint*; *Anio; Aope*
		DW 78	23°41.30'S, 167°59.60'E	233-360	30.X.1986	*Anov*
		DW 81	23°19.60'S, 168°03.40'E	320-340	31.X.1986	*Anor*
	MUSORSTOM 4	CP 217	23°03.6'S, 167°27.0'E	850	29.IX.1985	*Apsa*
		DW 220	22°58.5'S, 167°38.3'E	505-550	29.IX.1985	*Anor*
	SMIB 3	DW 18	23°41.50'S, 167°59.40'E	338	23.V.1987	*Abul*
	SMIB 4	DW 36	24°55.6'-24°54.9'S, 168°21.7'-168°21.7'E	500-530	7.III.1989	*Afla*; *Apsa*
		DW 37	24°54.5'-24°53.9'S, 168°22.3'-168°21.5'E	515-540	7.III.1989	*Aang*; *Apsa*
		DW 39	24°56.2'-24°55.4'S, 168°21.5'-168°21.5'E	525-560	7.III.1989	*Alon*; *Apsa*
		DW 50	23°42.4'-23°41.6'S, 168°00.8'-168°00.6'E	260-295	9.III.1989	*Alon*
		DW 51	23°41.3'-23°40.5'S, 168°00.6'-168°00.7'E	245-260	9.III.1989	*Abul*; *Anov*
		DW 53	23°40.1'-23°39.5'S, 167°59.9'-168°00.3'E	250-270	9.III.1989	*Abul*; *Anov*
		DW 55	23°21.4'-23°21.4'S, 168°04.5'-168°04.8'E	215-260	9.III.1989	*Alon*
		DW 60	23°00.1'-22°59.4'S, 167°21.6'-167°21.7'E	500-535	10.III.1989	*Apyg*
	SMIB 5	DW 70	23°40.6'S, 168°01.1'E	270	7.IX.1989	*Aang*; *Abul*; *Anov*
		DW71	23°41.3'S, 168°00.7'E	265	7.IX.1989	*Anov*
		DW 72	23°42.0'S, 168°00.8'E	400	7.IX.1989	*Abul*; *Alon*
		DW 76	23°41.2'S, 168°00.5'E	280	7.IX.1989	*Aang*; *Anov*
		DW 78	23°40.8'S, 168°00.2'E	245	7.IX.1989	*Abul*; *Anov*
		DW 88	22°28.6'S, 168°40.2'E	350	13.IX.1989	*Aang*
		DW 95	22°59.7'S, 168°19.8'E	200	14.IX.1989	*Aang*
		DW 101	23°21.2'S, 168°04.9'E	270	14.IX.1989	*Aang*; *Anov*
Chesterfield Islands	MUSORSTOM 5	CP 293	23°09.35'S, 159°30.80'E	280	11.X.1986	*Apsa*
Gemini Seamounts/ Vanuatu	GEMINI	DW 60	20°59.9'S, 170°16.6'E	190	6.VII.1989	*Agem*

168°21.5'E, 515-540 m, 7.III.1989, 1 stem *c.* 24 mm high, with coppinia (MNHN-Hy.2009-0180).
SMIB 5, stn DW 70, 23°40.6'S, 168°01.1'E, 270 m, 7.IX.1989, 1 stem *c.* 7 mm high and a few fragments up to 20 mm long (RMNH-Coel. no. 31497). — Stn DW 76, 23°41.2'S, 168°00.5'E, 280 m, 7.IX.1989, 1 stem *c.* 22 mm high (MNHN-Hy.2009-0181). — Stn DW 88, 22°28.6'S, 168°40.2'E, 350 m, 13.IX.1989, 1 stem *c.* 15 mm high (MNCN 2.03/405). — Stn DW 95, 22°59.7'S, 168°19.8'E, 200 m, 14.IX.1989, 3 stems up to 25 mm high (MNHN-Hy.2009-0182). — Stn DW 101, 23°21.2'S, 168°04.9'E, 270 m, 14.IX.1989, 1 fragment *c.* 18 mm long (MNCN 2.03/406).

Ecology and distribution. — *Acryptolaria angulata* seems to be a bathyal species. It was previously known from depths between 180 m (Bale 1914) and 324 m (Bale 1915); our material was collected at depths from 150 to 965 m, extending considerably the lower limit of its bathymetric range. Schuchert (2003) reported it on bottoms of sandy mud and small stones. Hitherto it was only known from the Great Australian Bight (Bale 1914, 1915) and the Kei Islands, Indonesia (Schuchert 2003). Our material originates from the Loyalty Islands and the Norfolk Ridge areas and was also epibiotic on coral. Coppiniae were found in February, March, August and September.

Description

Polysiphonic stems up to 62 mm high (Fig. 31A), with a variable degree of branching, but up fifth-order branches observed. Usually branching irregular and in one plane, frequently with anastomoses, giving a mesh-shaped appearance to the stems. Branches straight (Fig. 1A).

Hydrothecae alternately arranged and more or less in one plane (Fig. 1A), roughly cylindrical, but with a strongly marked constriction due to a sharp perisarc invagination at about basal third of adcauline wall (Fig. 1A-F); diameter also decreasing at basal part. Hydrotheca curved twice: strongly outwards at distal part of adnate portion, becoming approximately perpendicular to the adnate part, and slightly or strongly upwards just after the adnate wall becomes free. Abcauline wall with a distinct inflexion point at approximately half its length; in some colonies forming a deep embayment at that point; some hydrothecae may there become collapsed (Fig. 1E, F). Basal part of abcauline wall usually straight, parallel to longitudinal axis of branch; distal part slightly to strongly convex. Adcauline wall broadly convex at adnate part and concave at free portion. Adcauline wall adnate over half its length (adnate/free ratio 1.6). Hydrotheca with a strongly marked, basal ring of desmocytes (Fig. 1C, D, F). Hydrothecal aperture circular, oblique, upwardly directed at a varied degree (35-75°). Rim even, sometimes with short renovations.

Large nematocysts very abundant, relatively small, ovoid (Fig. 30) and provided with a lateral opening.

Gonothecae set into a coppinia deprived of defensive tubes (Fig. 1I, G), bottle-shaped, with a distal neck (Fig. 1I, J). Gonothecal diameter gently increasing from base to distal neck where the diameter strongly decreases. In the material from SMIB 4 stn DW 37 the gonothecae are closely grouped, forming a tight mosaic in dorsal view (Fig. 1G), and provided with a short neck with a wide aperture (Fig. 1H). In the material from BIOCAL 1 stn CP 84, the gonothecae have a longer neck (Fig. 1J), with a slightly smaller distal aperture. Some gonothecae with renovations of the rim (Fig. 1I).

Remarks

The degree of branching is varied; for example, in the material from BIOCAL 1 stn CP 84 the stems are much branched, with up to fifth-order branches observed, whereas in the material from SMIB 4 stn DW 37, only secondary branches are present.

The type material of *Acryptolaria angulata* was recently examined by Peña Cantero *et al.* (2007) who established the differences with the related species (i.e. *A. bulbosa* and *A. rectangularis*) (see Peña Cantero *et al.* 2007 for a fuller discussion). This material consisted of microslide preparations, which made it difficult to find nematocysts of which only inaccurate measurement could be taken; however, a few large nematocysts could then be observed. Through the study of our material it has also been confirmed the presence of the small-group nematocysts in this species.

The present material allowed a more precise characterization of Bale's species, as well as the description of the unknown coppinia. *Acryptolaria angulata* is identifiable by the shape of the hydrotheca with its characteristic sharp perisarc invagination at about the basal third of its adcauline wall. The hydrothecal

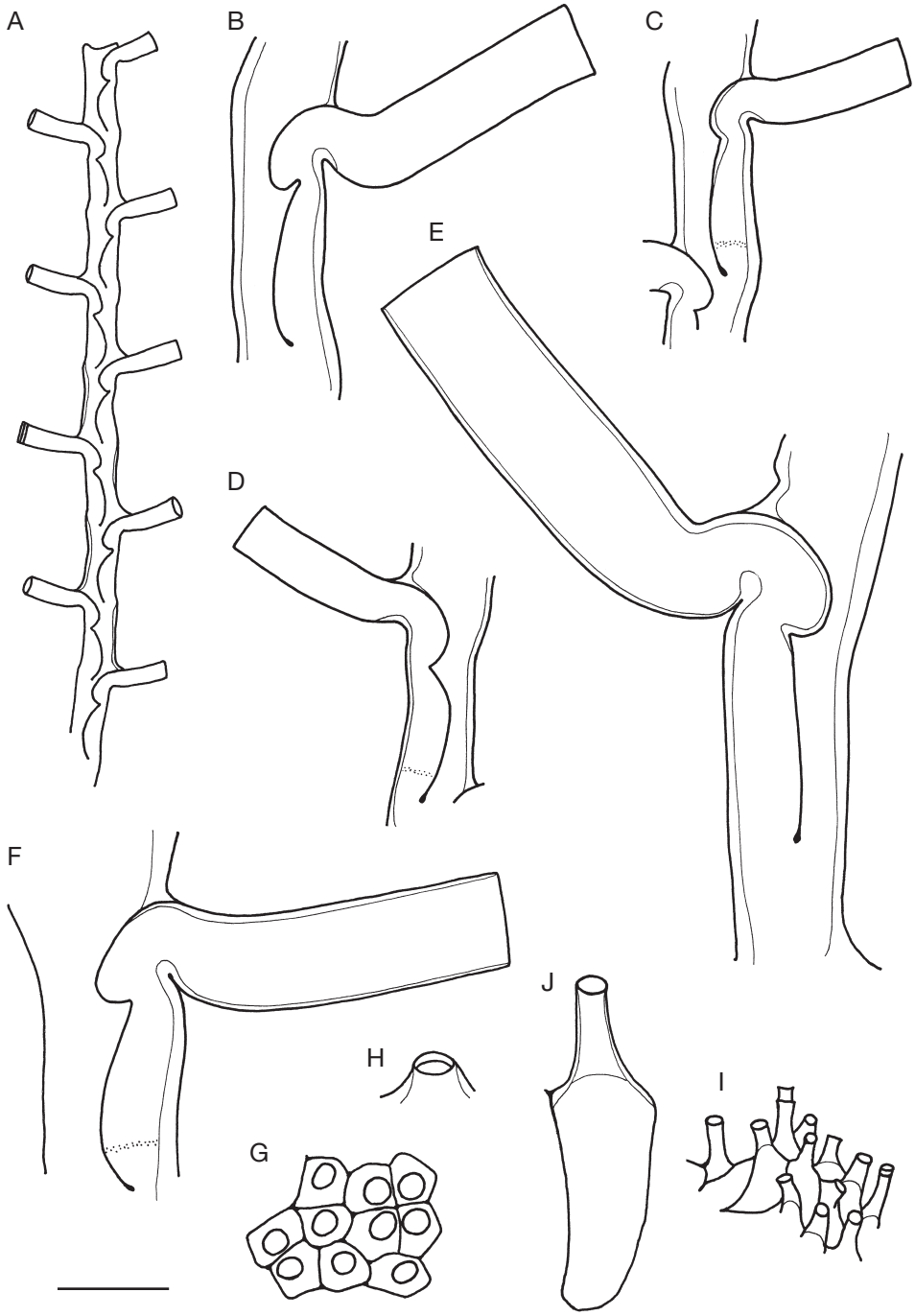

FIG. 1. — *Acryptolaria angulata* (Bale, 1914): **A**, branch fragment showing hydrothecal arrangement; **B**-**F**, hydrothecae; **G**, **I**, part of coppinia; **H**, gonothecal aperture; **J**, gonotheca (lateral view); **A**, **I**, **J**, from BIOCAL 1 stn CP 84; **B**, **G**, **H**, from SMIB 4 stn DW 37; **C**, from BIOCAL 1 stn DW 51; **D**, from SMIB 5 stn DW 101; **E**, from BIOCAL 1 stn DW 44; **F**, from MUSORSTOM 6 stn DW 489. Scale bar: A, 600 µm; B-G, I, 250 µm; H, J, 125 µm.

TABLE 2. — Measurements of *Acryptolaria angulata* (Bale, 1914) from several stations (in µm). Gonothecae: **A**, from BIOCAL 1 stn CP 84; **B**, from SMIB 4 stn DW 37.

	Range	Mean ± SD (n)
Hydrothecae		
Length of abcauline wall	650-1650	951.8 ± 255.3 (17)
Length of adcauline wall	780-1780	1078.8 ± 282.2 (17)
Length of free adcauline wall	250-880	447.1 ± 180.4 (17)
Length of adnate adcauline wall	500-900	631.8 ± 111.6 (17)
Ratio adnate/free adcauline wall	1.0-2.4	1.6 ± 0.4 (17)
Diameter at aperture	110-260	150.6 ± 42.1 (17)
Gonothecae	A/B	
Length	*c.* 370	
Maximum diameter	*c.* 120/*c.* 100	
Length of funnel	*c.* 100/*c.* 30	
Diameter at aperture	30-40/50-70	
Nematocysts		
Larger group SMIB 4 stn DW 37	15-17 × 8-9	15.9 ± 0.6 × 8.6 ± 0.4 (10)
BIOCAL 1 stn CP 84	15-16 × 6-7	15.5 ± 0.4 × 6.7 ± 0.3 (10)
Ratio SMIB 4 stn DW 37	1.8-2.0	1.9 ± 0.1 (10)
BIOCAL 1 stn CP 84	2.2-2.7	2.3 ± 0.1 (10)
Smaller group	6-7.5 × 3-4	

TABLE 3. — Measurements of *Acryptolaria bathyalis* n. sp. from the holotype (in µm) (whole range from several stations).

	Range	Mean ± SD (n)	Whole range (n)
Hydrothecae			
Length of abcauline wall	680-770	710.0 ± 26.8 (10)	600-770 (30)
Length of adcauline wall	880-1000	949.5 ± 37.0 (10)	780-1030 (30)
Length of free adcauline wall	140-250	199.5 ± 29.0 (10)	110-300 (30)
Length of adnate adcauline wall	700-770	750.0 ± 19.0 (10)	600-790 (30)
Ratio adnate/free adcauline wall	3.0-5.3	3.8 ± 0.6 (10)	2.0-7.2 (30)
Diameter at aperture	150-180	171.5 ± 10.3 (10)	140-180 (30)
Nematocysts			
Larger group	20.5-23.5 × 8-9	21.6 ± 0.8 × 8.5 ± 0.4 (10)	19-23.3 × 7.5-9 (24)
Ratio	2.3-2.9	2.5 ± 0.2 (10)	
Smaller group	6.5 × 3		

abcauline embayment has a varied development. In some hydrothecae it is just slightly appreciable (Fig. 1A, D), whereas in others there is a deep invagination (Fig. 1B, C). On the other hand, there are hydrothecae in which the deep embayment may be more or less closed, the two parts of the abcauline wall come in close contact and even become fused (Fig. 1E, F). This also happens in other species of the genus (cf. *A. bulbosa* and *A. inversa* n. sp.).

Notwithstanding the amazing variation in the size of the hydrothecae, we are apparently dealing with a single species, because there is an almost complete gradual overlap. Furthermore, there are no differences in the nematocysts of the larger size class. The differences in the shape of the gonothecae between the material from SMIB 4 stn DW 37 and BIOCAL 1 stn CP 84 could be due to sexual dimorphism.

Acryptolaria bathyalis n. sp.
(Figs 2; 30; 31B; Table 3)

TYPE MATERIAL. — **Loyalty Islands.** MUSORSTOM 6, stn CP 419, 20°41.65'S, 167°03.70'E, 283 m, 16.II.1989, 1 stem *c.* 70 mm high, holotype (MNHN-Hy.2009-

0158); several fragments up to 25 mm long, paratype (RMNH-Coel. no. 31499) and 2 slides, paratypes (MNHN-Hy.2009-0147 and RMNH Coel. no. 35167 slide 734).

OTHER MATERIAL EXAMINED. — **Loyalty Islands.** BIOCAL 1, stn DW 82, 20°30.658'-20°30.888'S, 167°50.308'-167°50.367'E, 440-460 m, 6.IX.1985, 3 stems up to 36 mm high (MNCN 2.03/407); 1 stem *c.* 26 mm high in slide (MNCN 2.03/392).
MUSORSTOM 6, stn CP 415, 20°40.20'S, 167°03.95'E, 461 m, 15.II.1989, 1 stem *c.* 45 mm high (RMNH-Coel. no. 31498) and 1 stem *c.* 35 mm high (RMNH-Coel. no 35113, slide 675). — Stn CP 464, 21°02.30'S, 167°31.60'E, 430 m, 21.II.1989, 1 stem *c.* 22 mm high (MNCN 2.03/408).
SE New Caledonia. MUSORSTOM 4, stn CP 237, 22°12.0'S, 167°16.5'E, 630 m, 2.X.1985, a few stems up to 22 mm high, on axis of gorgonian (MNCN 2.03/409).

ETYMOLOGY. — The specific name *bathyalis*, from the Greek "bathos" = deep, refers to the depths at which the species was found; it is an adjective following the genus name in gender.

ECOLOGY AND DISTRIBUTION. — *Acryptolaria bathyalis* n. sp. was found at depths between 283 and 630 m; one colony was attached to the axis of a gorgonian. It has been collected at the Loyalty Islands and SE of New Caledonia.

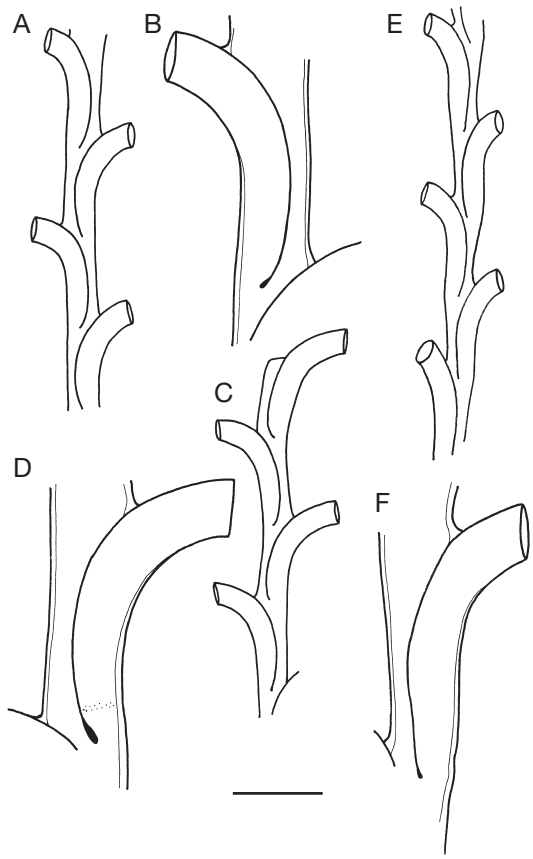

FIG. 2. — *Acryptolaria bathyalis* n. sp.: **A**, **C**, **E**, branch fragments showing hydrothecal arrangement; **B**, **D**, **F**, hydrothecae; **A**, **B**, from MUSORSTOM 6 stn CP 419; **C**, **D**, from MUSORSTOM 6 stn CP 415; **E**, **F**, from BIOCAL 1 stn DW 82. Scale bar: A, C, E, 600 µm; B, D, F, 250 µm.

DESCRIPTION

Stems up to 70 mm high. Branching frequent, at least 5th order branches present (Fig. 31B). Branching irregular in several planes, occasionally in one plane; with anastomoses. Branches straight, long and thin; with exception of basal part of stem, perisarc of branches little developed (Fig. 2A, C, E).

Hydrothecae alternately arranged in approximately one plane (Fig. 2A, C, E), cylindrical (Fig. 2), with a constant diameter throughout, only decreasing at their base. Hydrotheca curved outwards at distal half; basal half of abcauline hydrothecal wall parallel to branch. Adcauline wall adnate to internode in about four-fifths (adnate/free ratio 3.8). Adcauline wall convex throughout; abcauline wall completely concave or straight at basal half. Hydrothecal aperture circular and outwards directed, roughly parallel to long axis of branches. Rim even, sometimes with short renovations.

Large nematocysts relatively large and fusiform (Fig. 30).

Coppinia not found.

REMARKS

Acryptolaria bathyalis n. sp. is characterized by the cylindrical hydrothecae and the soft, long and straight branches. It is allied to *Acryptolaria abies* in having straight branches and in the shape and size of the hydrothecae, though the latter has a larger part of the adcauline wall free. They are clearly distinguishable by the size of the nematocysts (11.2 × 4.6 µm in the lectotype of *A. abies*).

Acryptolaria bulbosa (Stechow, 1932) (Figs 3; 30; 31C; Table 4)

Cryptolaria bulbosa Stechow, 1932: 87.

Acryptolaria bulbosa – Yamada 1959: 49. — Peña Cantero *et al.* 2007: 237-240, fig. 3, tab. III.

Acryptolaria rectangularis – Schuchert 2003: 154, 155, fig. 13.

Material examined. — **Philippines.** MUSORSTOM 3, stn DR 117, 12°31.2'-12°31.3'N, 120°39.3'-120°39.5'E, 92-97 m, 3.VI.1985, 4 fragments up to 40 mm long (MNHN-Hy.2009-0183).
Loyalty Islands. BIOCAL 1, stn DW 08, 20°34.351'-20°35.092'S, 166°53.904'-166°54.051'E, 435 m, 12.VIII.1985, 1 stem *c.* 7 mm high (RMNH-Coel. no. 31500).
MUSORSTOM 6, stn DW 397, 20°47.35'S, 167°05.17'E, 380 m, 13.II.1989, many tangled stems up to 25 mm high (MNCN 2.03/410). — Stn DW 406, 20°40.65'S, 167°06.80'E, 373 m, 15.II.1989, 4 stems up to 12 mm high on bryozoans, with coppinia (MNHN-Hy.2009-0184). — CP 419, 20°41.65'S, 167°03.70'E, 283 m, 16.II.1989, many stems up to 25 mm high on tube of benthic organism, with coppinia (MNHN-Hy.2009-0185); 1 stem *c.* 15 mm high and a fragment *c.* 7 mm long in 2 slides (MNHN-Hy.2009-0148 and RMNH-Coel. no. 35166, slide 733).
Norfolk Ridge. CHALCAL 2, stn DW 76, 23°40.50'S, 167°45.20'E, 470 m, 30.X.1986, 1 stem *c.* 24 mm high, with coppinia (RMNH-Coel. no. 31501).
SMIB 3, stn DW 18, 23°41.50'S, 167°59.40'E, 338 m, 23.V.1987, a few stems up to 7 mm high on coral (MNHN-Hy.2009-0186); 1 stem *c.* 10 mm high in slide (MNHN-Hy.2009-0149).
SMIB 4, stn DW 51, 23°41.3'-23°40.5'S, 168°00.6'-168°00.7'E, 245-260 m, 9.III.1989, 1 fragment *c.* 10 mm long (MNCN 2.03/411). — Stn DW 53, 23°40.1'-23°39.5'S, 167°59.9'-168°00.3'E, 250-270 m, 9.III.1989, 1 fragment *c.* 13 mm long (MNHN-Hy.2009-0187).
SMIB 5, stn DW 70, 23°40.6'S, 168°01.1'E, 270 m, 7.IX.1989, 5 stems and fragments up to 6 mm long (MNCN 2.03/412). — Stn DW 72, 23°42.0'S, 168°00.8'E, 400 m, 7.IX.1989, 2 fragments up to 7 mm long (RMNH Coel. no. 31502), plus 1 fragment *c.* 4 mm long (RMNH-Coel. no. 25934, slide 978B). — Stn DW 78, 23°40.8'S, 168°00.2'E, 245 m, 7.IX.1989, a few stems up to 16 mm high, MNHN-Hy.2009-0188.

Ecology and distribution. — *Acryptolaria bulbosa* apparently has an Indo-Pacific pattern of distribution. It is definitely known from Sagami Bay (Stechow 1932) and the Kei Islands, Indonesia (Schuchert 2003), but it is probably also present in the western part of the Indian Ocean (cf. Millard 1967, 1968; Gravier-Bonnet 1979). Our material was found epibiotic on bryozoans, corals and tubes of benthic organisms at depths between 92 and 470 m at the Loyalty Islands and the Norfolk Ridge, in the New Caledonian area, and in the Philippines. Coppiniae were found in February and October.

Description

Polysiphonic stems up to 25 mm high (Fig. 31C). Branching frequent, irregular, but usually in one plane, sometimes with anastomoses. Branches straight or with an almost unperceptible zigzag (Fig. 3A).

Hydrothecae alternately arranged in one plane (Fig. 3A, B). Hydrotheca broadly cylindrical, basal part clearly decreasing in diameter (Fig. 3A-D); curved twice: strongly outwards at distal part of adnate portion, that part becoming more or less perpendicular to adnate portion, and slightly (Fig. 3B) or strongly upwards (Fig. 3A, C), usually some distance after adnate wall becomes free. Abcauline wall with a distinct inflexion point at about half its length; in some colonies forming a deep embayment at that point (Fig. 3B-D), sometimes followed by a sort of hump (Fig. 3A, B, D). Embayment frequently collapsed, with the two parts of abcauline wall fused (Fig. 3A, B). Basal part of abcauline wall slightly convex; distal part also slightly convex. Adcauline wall adnate for over half its length (adnate/free ratio 1.5), convex at adnate part and concave, or straight distally, at free portion. Hydrothecal aperture circular, oblique and strongly upwardly directed (35-40°). Rim even, sometimes with short renovations.

Large nematocysts relatively large and banana shaped (Fig. 30).

Gonothecae set closely together into a coppinia (Fig. 3E-G) provided with branched defensive tubes that form a protective canopy (Fig. 3F), bottle-shaped, with a distal neck with circular aperture (Fig. 3E-G).

Remarks

As in other species of the genus (e.g., *A. angulata*), there is a considerable variability in the size of the hydrothecae, but it seems to be intraspecific variation because there are intermediate states between the extremes and there is no difference in the size of the nematocysts.

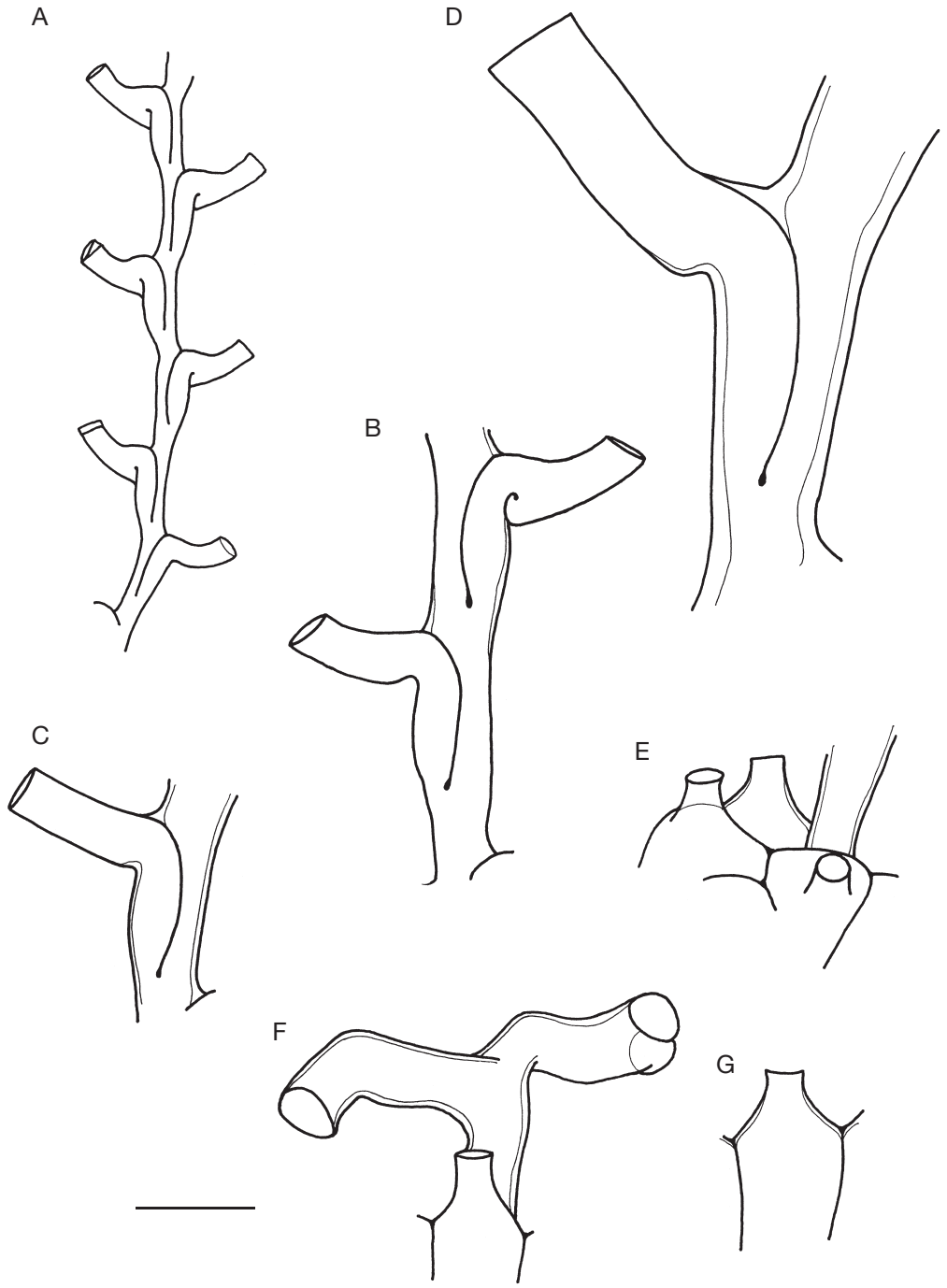

Fig. 3. — *Acryptolaria bulbosa* (Stechow, 1932): **A**, branch fragment showing hydrothecal arrangement; **B**-**D**, hydrothecae; **E**-**G**, gonothecae (in **F** with branched defensive tube); **A**, from MUSORSTOM 6 stn CP 419; **B**, from SMIB 4 stn DW 53; **C**, from SMIB 5 stn DW 70; **D**, from BIOCAL 1 stn DW 08; **E**-**G**, from MUSORSTOM 6 stn DW 406. Scale bar: A, 600 µm; B-D, 250 µm; E-G, 125 µm.

TABLE 4. — Measurements of *Acryptolaria bulbosa* (Stechow, 1932) from several stations (in µm).

	Range	Mean ± SD (n)
Hydrothecae		
Length of abcauline wall	600-1080	612.5 ± 162.2 (12)
Length of adcauline wall	580-1200	716.3 ± 182.2 (12)
Length of free adcauline wall	230-560	296.3 ± 95.1 (12)
Length of adnate adcauline wall	320-640	420.0 ± 97.3 (12)
Ratio adnate/free adcauline wall	1.1-2.3	1.5 ± 0.3 (12)
Diameter at aperture	100-210	130.8 ± 34.3 (12)
Gonothecae		
Maximum diameter	*c*. 120	
Length of funnel	*c*. 60	
Diameter at aperture	*c*. 40	
Nematocysts		
Larger group	19.5-22 × 5-9	20.7 ± 0.7 × 6.7 ± 1.3 (24)
Ratio	2.2-4.4	3.2 ± 0.6 (24)
Smaller group	5.5-6.5 × 2.5-3	

The development of the hydrothecal abcauline embayment is variable, as also occurs in other species of this genus (e.g., *A. angulata* and *A. inversa* n. sp.). It is possible to find, even on the same stem (Fig. 3A, B), hydrothecae with a slight embayment, others with a deep one and, finally, others with fusion of the two sides.

Peña Cantero *et al.* (2007) discussed the relationship of this species with its allies *A. angulata* and *A. rectangularis*. According to these authors the three species are valid and we agree, though the situation with regards to *A. rectangularis* is confused because the type material could not be found and it was poorly described with no information about the cnidome.

As also indicated by Peña Cantero *et al.* (2007), Hirohito's (1995) material of *A. angulata* does not belong to Bale's species, being almost certainly conspecific with *A. bulbosa*. However, lack of knowledge of the nematocysts prevents us from considering them conspecific, since Hirohito's material could also represent *A. intermedia* n. sp.

The material described by Gravier-Bonnet (1979) as *A. rectangularis* could actually belong to *A. bulbosa*, with which it agrees both in shape and size of the hydrothecae. However, without information about the cnidome we cannot be certain, because it is also similar to *A. intermedia* n. sp. in the shape of the hydrothecae, though in the latter the hydrothecae are slightly smaller and have a characteristic internal abcauline cusp (see the description of this species below).

We agree with Peña Cantero *et al.* (2007) that the material assigned to *A. rectangularis* by Millard (1967) probably includes two species. One could be *A. rectangularis* (stn ABD 15P, figure 2B, left), but the other (stn AFR 1251D, figure 2B, right) could be either *A. bulbosa* or *A. intermedia* n. sp. The material from stn AFR 1251D coincides with these two species in the shape of the hydrothecae, though it apparently lacks the internal abcauline cusp of *A. intermedia* n. sp. However, it is closer to this species in the size of the hydrotheca (compare Millard's measurements with those of Table 31). The same holds for the material assigned to *A. rectangularis* by Millard (1968), which agrees with Stechow's species in both shape and size of the hydrothecae so it could possibly be conspecific with *A. bulbosa*. However, without information on the nematocysts it is risky to do so since Millard's material also agrees with *A. intermedia* n. sp. in the shape of the hydrothecae, although in this case the size of the hydrothecae is closer to *A. bulbosa*.

Part of the material assigned to *A. angulata* by Vervoort & Watson (2003) could actually belong to *A. bulbosa*, in particular the material from NZOI stn K855 which closely resembles part of our material of that species (see figure 3C, E in Vervoort & Watson 2003: 42). However, it is necessary to check the cnidome to confirm this record.

Schuchert's (2003) material of *A. rectangularis* belongs to *A. bulbosa* with which it agrees in shape and size of the hydrothecae, as well as in the size of the nematocysts (23 × 7 µm).

Acryptolaria cf. *conferta* (Allman, 1877)
(Figs 4; 30; Table 5)

Cryptolaria conferta Allman, 1877: 17, 19, 20, pl. 12, figs 6-10.

Acryptolaria conferta – Peña Cantero *et al.* 2007: 240-243, figs 4, 15B, 17C, 19A, tab. IV.

MATERIAL EXAMINED. — **New Caledonia.** BIOCAL 1, stn CP 75, 22°18.650'-22°20.429'S, 167°23.302'-167°23.416'E, 825-860 m, 4-5.IX.1985, 3 stems up to 15 mm high (MNHN-Hy.2009-0189).
Loyalty Islands. MUSORSTOM 6, stn DW 489, 20°48.37'S, 167°05.86'E, 700 m, 24.II.1989, 2 stems up to 20 mm high (RMNH-Coel. no. 31503); 1 branched stem, 16 mm high (RMNH-Coel. no. 35136, slide 698).

ECOLOGY AND DISTRIBUTION. — *Acryptolaria conferta* is with certainty known from off Cojima, Cuba, where it was found at a depth of 810 m (Allman 1877). Our material was collected at depths from 700 to 860 m at the Loyalty Islands and in New Caledonian waters.

DESCRIPTION

Polysiphonic stems up to 20 mm high. Branching frequent, up to 3rd order branches observed, irregular and in several planes; branches in a distinct zigzag pattern (Fig. 4).

Hydrothecae (Fig. 4) alternate and more or less in one plane, tubular, almost cylindrical in the free part, diameter gently decreasing basally at adnate part, narrowest at base. Hydrotheca smoothly curved outwards at distal half; around three-fourths of adcauline wall adnate to internode (adnate/free ratio 2.8). Adcauline wall convex, though becoming straight at basal third. Abcauline wall straight basally and concave at distal half. Hydrothecal aperture circular, directed upwards (*c.* 55°). Rim even, sometimes with short renovations.

Large nematocysts relatively large and fusiform (Fig. 30).

Coppinia not found.

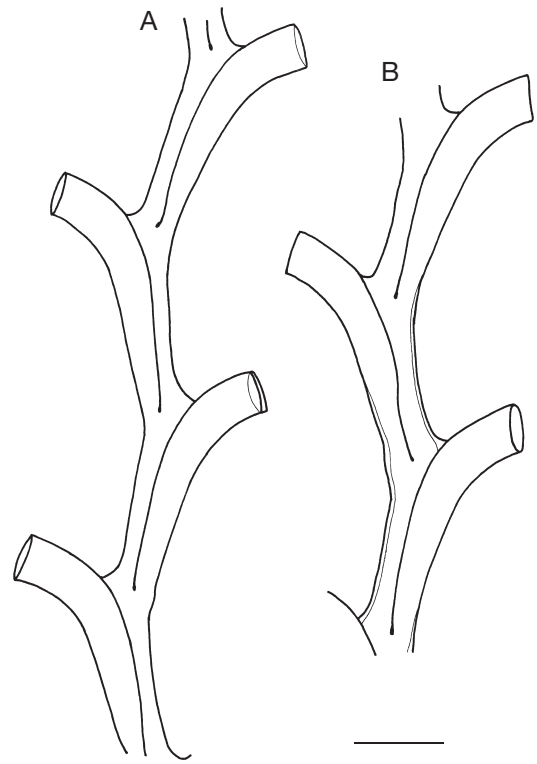

FIG. 4. — *Acryptolaria* cf. *conferta* (Allman, 1877), from MUSORSTOM 6 stn DW 489: **A**, **B**, branch fragments showing hydrothecal arrangement and hydrothecae. Scale bar: 250 µm.

REMARKS

Peña Cantero *et al.* (2007) provide a redescription and extensive discussion of the species. Our material strongly resembles Allman's species in the general appearance of the colony, the strong zigzag structure of the branches and the shape of the hydrothecae. Notwithstanding these similarities, it differs from the type material in having slightly smaller hydrothecae (cf. Peña Cantero *et al.* 2007: table IV) and slightly larger nematocysts (20.3 × 8.2 µm in the holotype). These differences, together with the absence of coppinia in our material and the large geographical distance from the type locality (northwestern Atlantic), prevent us from definitely assigning our material to Allman's species, waiting for further confirmation of its presence in the New Caledonian area.

TABLE 5. — Measurements of *Acryptolaria* cf. *conferta* (Allman, 1877) from MUSORSTOM 6 stn DW 489 (in µm).

	Range	Mean ± SD (n)
Hydrothecae		
Length of abcauline wall	600-650	626.3 ± 18.0 (8)
Length of adcauline wall	700-800	751.9 ± 30.5 (8)
Length of free adcauline wall	160-225	201.9 ± 21.9 (8)
Length of adnate adcauline wall	500-580	550.0 ± 28.7 (8)
Ratio adnate/free adcauline wall	2.3-3.6	2.8 ± 0.4 (8)
Diameter at aperture	120-140	128.8 ± 5.4 (8)
Nematocysts		
Larger group	21-23.5 × 7.5-10	22.4 ± 0.7 × 8.9 ± 0.9 (10)
Ratio	2.2.-3.0	2.6 ± 0.2 (10)
Smaller group	6-6.5 × 2.5-3	

Although *Acryptolaria conferta* is the most frequently recorded species of the genus, it has no clear distinguishing features, consequently records without information about the cnidome must be considered doubtful (cf. Peña Cantero *et al.* 2007).

Acryptolaria cf. *corniformis* Naumov & Stepanjants, 1962 (Fig. 5; Table 6)

Acryptolaria corniformis Naumov & Stepanjants, 1962: 74, fig. 2. — Stepanjants 1979: 51, pl. 9, figs 1-3. — Peña Cantero *et al.* 2007: 243-245, figs 5, 15C, 17D, tab. V.

MATERIAL EXAMINED. — **Loyalty Islands.** MUSORSTOM 6, stn DW 399, 20°41.80'S, 167°00.20'E, 282 m, 14.II.1989, one unbranched fragment *c.* 12 mm long (slide MNHN-Hy.2009-0150).

ECOLOGY AND DISTRIBUTION. — *Acryptolaria corniformis* was previously only known from off Sabrina Coast (Antarctica), where it was found at a depth of 289 m (Naumov & Stepanjants 1962; Stepanjants 1979). Our material was collected at 282 m depth in the Loyalty Islands area.

DESCRIPTION

All material available consists of an unbranched, straight fragment *c.* 12 mm long. The hydrothecae are alternately arranged in approximately one plane (Fig. 5A) and are tubular, roughly cylindrical at the long free part, but in diameter smoothly decreasing towards its base at adnate part; minimum diameter at base (Fig. 5A). Hydrotheca strongly directed outwards, adnate for slightly over half of its adcauline wall (adnate/free ratio 1.2). Distal part of hydrothecae almost straight. Adcauline wall slightly convex at adnate part but straight, or even slightly concave, at its free portion; abcauline wall straight with exception of the concave inflexion area. Hydrothecal aperture circular, oblique and directed upwards, forming an angle of *c.* 45° with long axis of internode. Rim even, slightly flared and frequently with a few short renovations (Fig. 5A).

Coppinia not found.

REMARKS

Acryptolaria corniformis is a little known species with just a single valid record. The available knowledge of this species is based on a single distal stem fragment, *c.* 20 mm long and preserved in a microslide preparation (holotype); it was examined by Peña Cantero *et al.* (2007) who found three putative nematocysts after careful examination of the material. Our present material is also preserved in a microslide, so that tracing and measuring the nematocysts was difficult and imprecise. In general our material agrees with the holotype in the general shape and size of the hydrothecae. It mainly differs in the size of the nematocysts, that are slightly smaller in the type material (10-15 × 3-5 µm), but because all available material is in microslide preparations, this difference is negligible. Our material also differs because in the holotype the hydrothecae

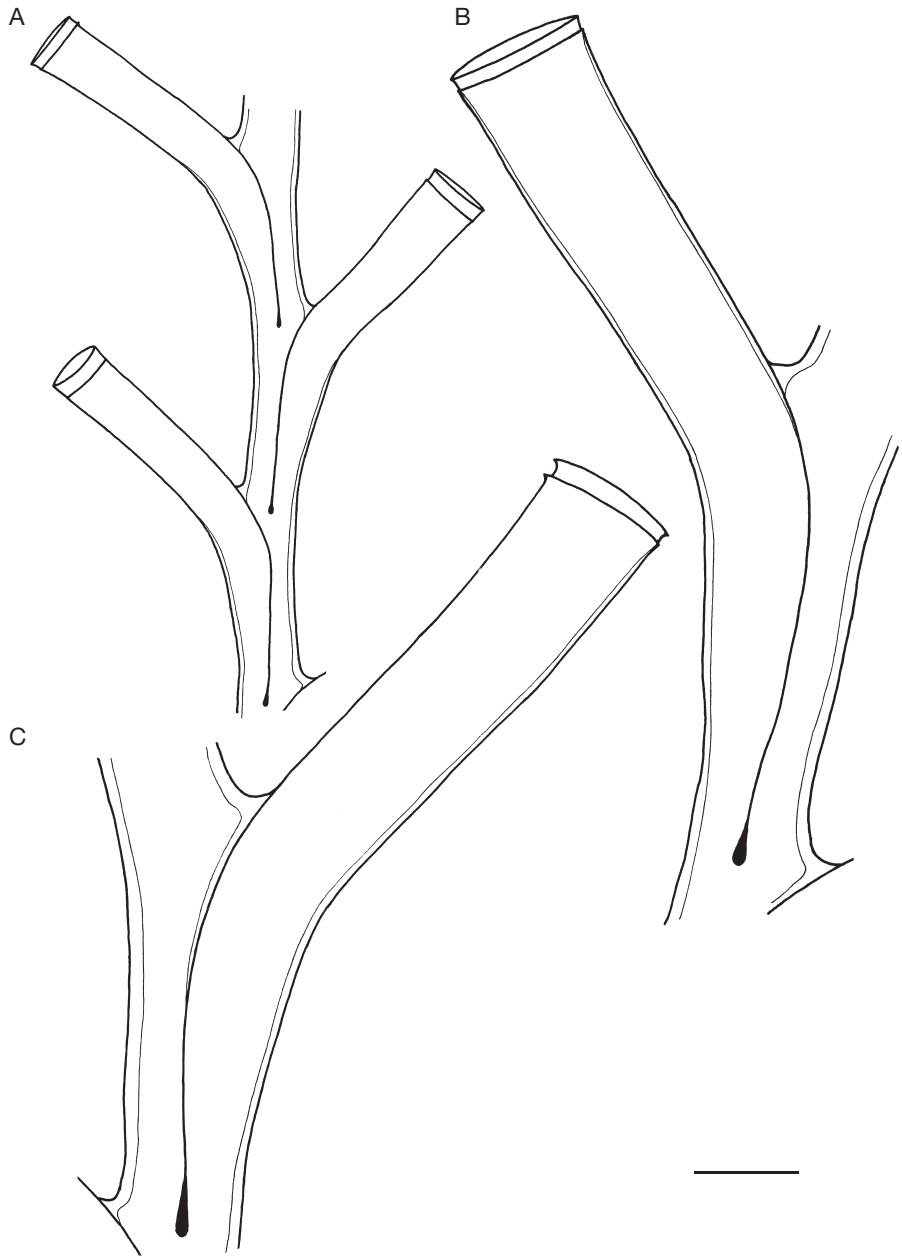

FIG. 5. — *Acryptolaria* cf. *corniformis* Naumov & Stepanjants, 1962, from MUSORSTOM 6 stn DW 399: **A**, branch fragment showing hydrothecal arrangement; **B**, **C**, hydrothecae. Scale bar: A, 600 µm; B, C, 250 µm.

are more gently curved outwards and the free adcauline portion of the hydrothecal wall is slightly convex. The differences, taking into account the scarcity of material available, do not seem important enough to separate our material from *A. corniformis*, but also considering that

TABLE 6. — Measurements of *Acryptolaria* cf. *corniformis* Naumov & Stepanjants, 1962 from MUSORSTOM 6 stn DW 399 (in µm).

	Range	Mean ± SD (n=8)
Hydrothecae		
Length of abcauline wall	1950-2100	2032.5 ± 41.2
Length of adcauline wall	2100-2310	2202.5 ± 64.0
Length of free adcauline wall	920-1060	982.5 ± 48.4
Length of adnate adcauline wall	1150-1280	1207.5 ± 49.2
Ratio adnate/free adcauline wall	1.1-1.4	1.2 ± 0.1
Diameter at aperture	310-370	341.9 ± 19.0
Nematocysts		
Larger group	16-19 × 8-9 (n = 4)	

TABLE 7. — Measurements of *Acryptolaria crassicaulis* (Allman, 1888) from several stations (in µm). Nematocysts from MUSORSTOM 4 stn CP 172.

	Range	Mean ± SD (n)
Hydrothecae		
Length of abcauline wall	730-900	815.5 ± 50.9 (10)
Length of adcauline wall	900-1100	999.5 ± 64.7 (10)
Length of free adcauline wall	350-470	395 ± 45.7 (10)
Length of adnate adcauline wall	550-650	604.5 ± 33.9 (10)
Ratio adnate/free adcauline wall	1.3-1.6	1.5 ± 0.2 (10)
Diameter at aperture	130-150	144.0 ± 8.9 (10)
Nematocysts		
Larger group	14-16 × 5.5-6.5	15.2 ± 0.5 × 5.9 ± 0.3 (10)
Ratio	2.5-2.8	2.6 ± 0.1
Smaller group	6-6.5 × 2.5-3	

they come from quite distant areas, we keep some doubts about their conspecificity. Future records will undoubtedly help to achieve a better understanding of this species.

The differences of *Acryptolaria corniformis* with *A. crassicaulis*, a species with which it had been considered related by Naumov & Stepanjants (1962) and Stepanjants (1979), or even conspecific by Gravier-Bonnet (1979), were discussed by Peña Cantero *et al.* (2007) who are of the opinion that they constitute two valid, clearly distinguishable species.

Acryptolaria crassicaulis (Allman, 1888) (Figs 6; 30; Table 7)

Cryptolaria crassicaulis Allman, 1888: lvii, lxvii, lxviii, 41, pl. 19, figs 3, 3a.

Acryptolaria crassicaulis – Peña Cantero *et al.* 2007: 245-247, figs 6, 15D, 17E, tab. VI.

MATERIAL EXAMINED. — **NW New Caledonia.** MUSORSTOM 4, stn CP 172, 19°1.2'S, 163°16.0'E, 275-330 m, 17.IX.1985, 2 stems 35 and 15 mm high (MNHN-Hy.2009-0190).
Loyalty Islands. BIOCAL 1, stn DW 08, 20°34.351'-20°35.092'S, 166°53.904'-166°54.051'E, 435 m, 12.VIII.1985, 1 stem *c.*19 mm high (MNHN-Hy.2009-0191).
BIOGEOCAL, stn DW 307, 20°35.38'-20°35.32'S, 166°55.25'-166°55.33'E, 470-480 m, 1.V.1987, 1 fragment *c.* 7 mm long (MNCN 2.03/413).
MUSORSTOM 6, stn DW 473, 21°08.80'S, 167°55.30'E, 236 m, 22.II.1989, a few stems up to 15 mm high (RMNH-Coel. no. 31504).

ECOLOGY AND DISTRIBUTION. — The only reliable record of *Acryptolaria crassicaulis* is from off Ascension Island (07°54'20"N, 14°28'20"W), where it was found at a depth of 756 m on volcanic sand (Allman 1888). Our material was collected at depths between 236 and 480 m at the Loyalty Islands and in New Caledonian waters.

DESCRIPTION

Polysiphonic stems up to 35 mm high. Branching frequent, irregular but usually in one plane; branches in a distinct zigzag pattern (Fig. 6), up to third-order branches have been observed. Anastomoses may be present.

Hydrothecae alternate and more or less in one plane (Fig. 6), tubular, almost cylindrical in the free part; diameter smoothly decreasing basally at adnate part; minimum diameter at base (Fig. 6). Hydrotheca gently curved outwards in distal half. Adcauline wall adnate with internode over almost two-thirds of its length (adnate/free ratio 1.5). Adcauline wall convex, though becoming straight at basal third. Abcauline wall concave, though straight at basal part. Hydrothecal aperture circular, directed outwards, almost parallel to long axis of internode (Fig. 6). Rim even, sometimes with numerous short renovations.

Large nematocysts relatively small and ovoid (Fig. 30).

Coppinia not observed.

REMARKS

Our material differs from the type material in having shorter stems and smaller hydrothecae (cf. Peña Cantero *et al.* 2007: table VI). However, it agrees with it in the size of the nematocysts (15.2 × 5.0 µm in the type material), the general appearance of the colony, the zigzag structure of the branches and the shape of the hydrothecae. The differences in the size of the hydrothecae are here considered to be of less importance taking into account the extremely large dimensional variation of this character found in other species studied (e.g., *A. angulata*).

Our material resembles *A. conferta* in the zigzag arrangement of the branches, as well as in the shape of the hydrothecae, but is distinctly different in the size of the nematocysts (cf. Table 31).

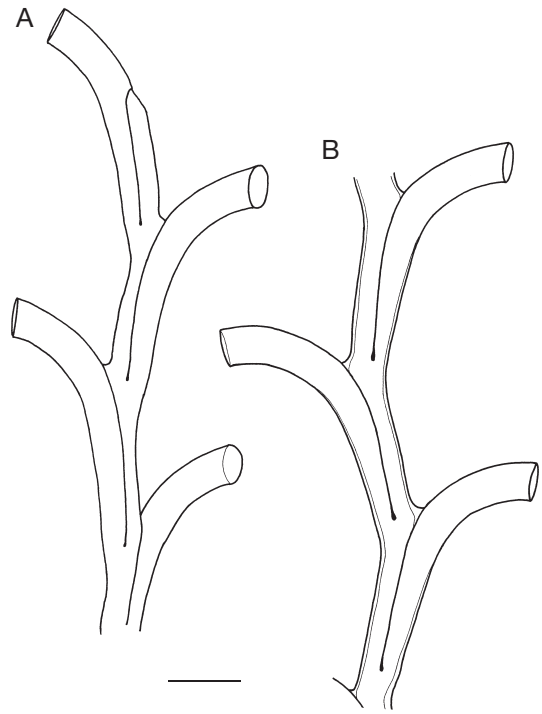

FIG. 6. — *Acryptolaria crassicaulis* (Allman, 1888): **A**, **B**, branch fragments showing hydrothecal arrangement and hydrothecae; **A**, from BIOCAL 1 stn DW 08; **B**, from BIOGEOCAL Stn DW 307. Scale bar: 250 µm.

Acryptolaria disordinata n. sp.
(Figs 7; 30; 31D; Table 8)

TYPE MATERIAL. — **NW New Caledonia.** MUSORSTOM 4, stn DW 197, 18°51.3'S, 163°21.0'E, 560 m, 20.IX.1985, several stems up to 60 mm high on coral, with coppinia: 1 stem holotype (MNHN-Hy.2009-0159); 5 stems paratypes (RMNH-Coel. no. 31505).

OTHER MATERIAL EXAMINED. — **NW New Caledonia.** MUSORSTOM 4, stn CP 194, 18°52.8'S, 163°21.7'E, 550 m, 19.IX.1985, 7 stems up to 45 mm high (MNCN 2.03/414). — Stn CP 195, 18°54.8'S, 163°22.2'E, 465 m, 19.IX.1985, 1 stem *c.* 40 mm high (MNHN-Hy.2009-0192). — Stn DW 197, 18°51.3'S, 163°21.0'E, 560 m, 20.IX.1985, 3 fragments up to 23 mm long (RMNH-Coel. no. 35506, slide 432).

ETYMOLOGY. — The specific name *disordinata* refers to the rather disordered disposition of the gonothecae in the coppinia. From the Latin verb "ordino", to order, to arrange; the particle "dis" expresses the contrary. Adjective following the genus name in gender.

ECOLOGY AND DISTRIBUTION. — *Acryptolaria disordinata* n. sp. was collected at depths between 465 and 560 m off NW New Caledonia. It was found epibiotic on coral. Coppiniae were found in September.

TABLE 8. — Measurements of *Acryptolaria disordinata* n. sp. from the holotype (in µm). Whole range from several stations.

	Range	Mean ± SD (n = 10)	Whole range (n)
Hydrothecae			
Length of abcauline wall	600-700	665.0 ± 30.7	690-900 (14)
Length of adcauline wall	750-870	821.5 ± 38.0	775-1100 (14)
Length of free adcauline wall	200-290	238.0 ± 30.9	240-470 (14)
Length of adnate adcauline wall	510-630	580.5 ± 37.6	535-670 (14)
Ratio adnate/free adcauline wall	1.9-3.0	2.5 ± 0.4	1.3-2.6 (14)
Diameter at aperture	130-150	139.5 ± 8.5	130-160 (14)
Gonothecae			
Length	250-300		
Maximum diameter	*c.* 150		
Length of funnel	*c.* 150		
Diameter at aperture	50-70		
Nematocysts			
Larger group	24.5-26.5 × 8.5-10	25.6 ± 0.6 × 9.4 ± 0.5	24-27 × 8-10 (16)
Ratio	2.6-3.1	2.7 ± 0.2	
Smaller group	6 × 3		

DESCRIPTION

Flabellate, polysiphonic stems up to 60 mm high, frequently branched; up to third-order branches observed (Fig. 31D). Branching irregular and with anastomoses, but strictly in one plane, giving the colonies a flabellate appearance. Branches straight (Fig. 7A), but distinctly widening at the place where hydrotheca becomes free (Fig. 7A-C).

Hydrothecae alternately arranged in approximately one plane (Fig. 7A-C). Hydrotheca cylindrical and of a constant diameter throughout, only decreasing in diameter at its base (Fig. 7A-C). Hydrotheca smoothly curved outwards; adcauline wall adnate to internode for over two-thirds of its length (adnate/free ratio 2.5), convex over its whole length. Abcauline wall completely concave or straight at basal half, with strongly developed perisarc reaching as far downwards as the hydrotheca situated below. Hydrothecal aperture circular, oblique and directed upwards, at an angle of *c.* 20° with long axis of branches. Rim even, frequently with short renovations (up to seven observed).

Large nematocysts relatively very large and fusiform (Fig. 30).

Female coppinia 12 mm long and 3 mm in maximum diameter, roughly fusifom, but with extensions on lower-order branches. Gonothecae set together, but not as tightly as in other species (Fig. 7D), consequently shape of gonotheca more variable and gonothecal walls fused to a varying degree. In general, gonothecae pear-shaped (Fig. 7D), with a main, swollen basal part and a long distal neck, provided with a distal, circular aperture. Rim even. Coppinia without defensive tubes. Planulae completing development outside gonothecae in an acrocyst.

REMARKS

In material from MUSORSTOM 4 stn DW 197, the stems grow side by side and anastomose, even with fusion of the coppiniae.

Acryptolaria disordinata n. sp. is characterized by the remarkable widening of the branch where the hydrotheca becomes free, by the cylindrical hydrothecae and by the disorderly arrangement of the gonothecae. It is allied to *A. bathyalis* n. sp. in the shape and size of the hydrotheca, but they differ because in the latter the branches are practically straight, the hydrothecae are less closely packed, the basal half of the abcauline hydrothecal wall remains parallel to the branch, the hydrotheca only curves outwards at the distal half, and because the nematocysts are distinctly smaller (21.6 × 8.5 µm).

Acryptolaria encarnae n. sp.
(Figs 8; 30; 31E; Table 9)

TYPE MATERIAL. — **Loyalty Islands.** MUSORSTOM 6,

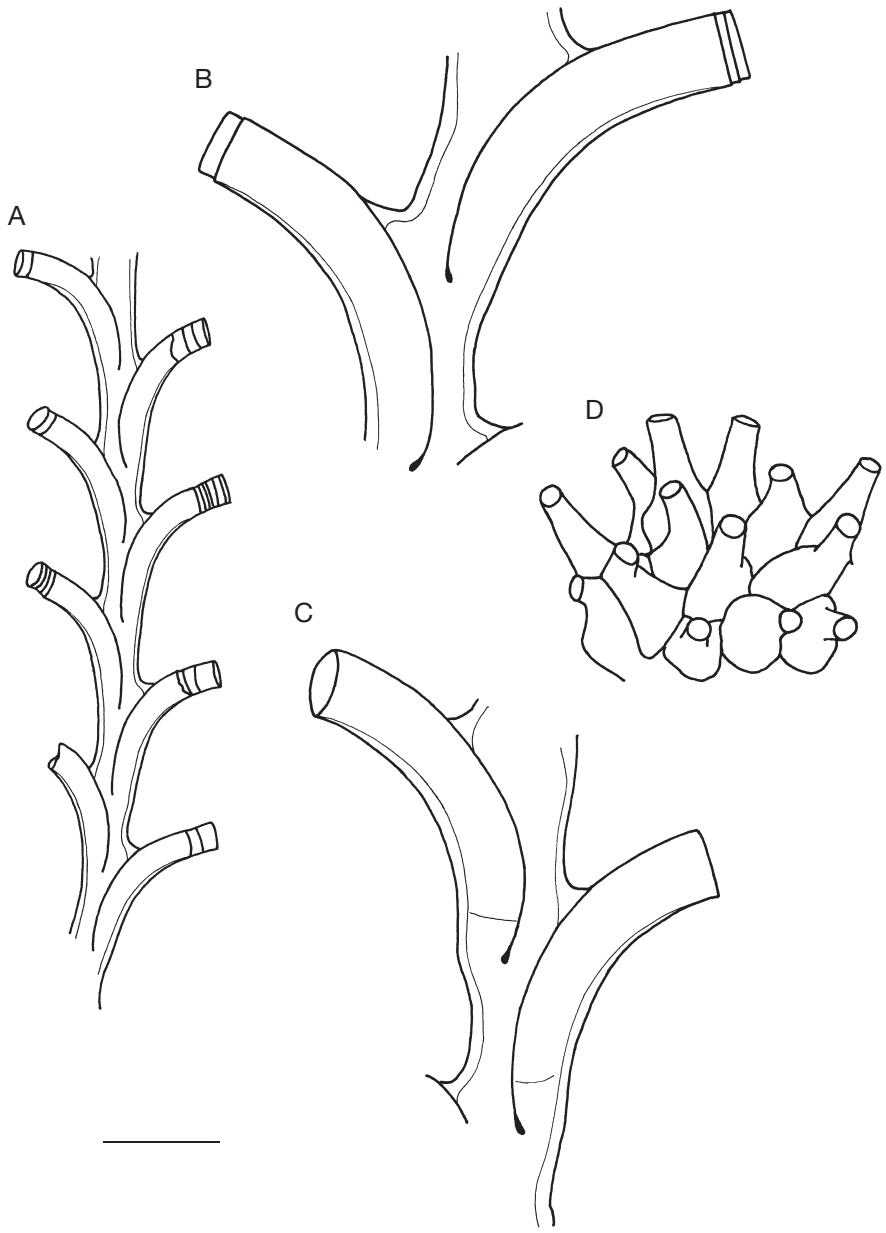

FIG. 7. — *Acryptolaria disordinata* n. sp., from MUSORSTOM 4 stn DW 197: **A**, branch fragment showing hydrothecal arrangement; **B**, **C**, hydrothecae; **D**, part of coppinia. Scale bar: A, 600 µm; B-D, 250 µm.

stn CP 464, 21°02.30'S, 167°31.60'E, 430 m, 21.II.1989, 1 stem *c.* 70 mm high, holotype (MNHN-Hy.2009-0160); 1 stem 50 mm high, paratype (RMNH-Coel. no. 31506).

OTHER MATERIAL EXAMINED. — **Norfolk Ridge.** BIOCAL 1, stn DW 66, 24°55.435'-24°54.849'S, 168°21.678'-168°21.995'E, 515-505 m, 3.IX.1985, 1 unbranched fragment *c.* 13 mm long in slide (MNCN 2.03/393).

TABLE 9. — Measurements of *Acryptolaria encarnae* n. sp. from the holotype (in µm).

	Range	Mean ± SD (n = 10)	BIOCAL 1 stn DW 66
Hydrothecae			
Length of abcauline wall	1350-1450	1404 ± 26.5	1470
Length of adcauline wall	1730-1880	1810 ± 42.7	1730
Length of free adcauline wall	580-800	659 ± 71.6	670
Length of adnate adcauline wall	1050-1200	1151 ± 51.5	1060
Ratio adnate/free adcauline wall	1.4-2	1.8 ± 0.2	1.6
Diameter at aperture	245-300	277 ± 15.4	250
Nematocysts			
Larger group	19-20 × 7-8	19.9 ± 0.3 × 7.5 ± 0.3	22-23 × 7-8 (n = 3)
Ratio	2.5-2.8	2.7 ± 0.1	
Smaller group	7-7.5 × 2		

ETYMOLOGY. — The species name *encarnae* is a dedication to Encarna Sancho Aguilar, wife of the first author. The name is a noun in female genitive.

ECOLOGY AND DISTRIBUTION. — *Acryptolaria encarnae* n. sp. was collected at depths between 430 and 515 m in both the Loyalty Islands area and at the Norfolk Ridge.

DESCRIPTION

Stems up to 70 mm high, strongly polysiphonic and with dish-shaped hydrorhiza (Fig. 31E). Branching scarce and irregular; primary branches originating at basal part of stem, long, straight, upward directed and usually unbranched. 70 mm high stem of holotype with first 9 mm unbranched and tortuous, then with a primary branch of stronger development than main stem. The other stem in the sample (paratype) could actually be a detached primary branch of the main stem. The primary branch of the holotype gives rise to three secondary branches; of these, one forms two third-order branches, whereas the other two are unbranched, one is even 45 mm long. Main stem giving rise to two extra primary branches, the basal one forming two secondary branches. Branches straight (Fig. 8A, B).

Hydrothecae alternately arranged in approximately one plane (Fig. 8A, B), cylindrical (Fig. 8), diameter decreasing only slightly at basal part. Hydrothecae gently curved outwards, adcauline wall convex throughout, abcauline wall concave. They are adnate for almost two-thirds of their adcauline length (adnate/free ratio 1.8). Hydrothecal aperture circular and directed outwards, almost parallel to long axis of branch (Fig. 8); rim even. Some hydrothecae with dish-shaped operculum.

Large nematocysts relatively large and fusiform (Fig. 30).

Coppinia not found.

REMARKS

Acryptolaria encarnae n. sp. is clearly recognizable by the colony structure, with long, straight and little branched primary branches, and by the shape of the hydrothecae which are almost cylindrical throughout and gently curved outwards.

The material from BIOCAL 1 stn DW 66 has slightly larger nematocysts (cf. Table 9) and the hydrothecae are less strongly directed outwards (Fig. 8E).

Acryptolaria encarnae n. sp. resembles *A. abies* in the straight branches and general shape of the hydrotheca but the two species are easily distinguishable because in *A. abies* the hydrothecae are much smaller (cf. Peña Cantero *et al.* 2007: table I) as also applies to the nematocysts (11.2 × 4.6 µm in the lectotype).

Acryptolaria flabelloides n. sp.
(Figs 9; 30; 31F; Table 10)

TYPE MATERIAL. — **Norfolk Ridge.** SMIB 4, DW 36, 24°55.6'-24°54.9'S, 168°21.7'-168°21.7'E, 500-530 m, 7.III.1989, 4 stems up to 60 mm high, largest one with coppinia holotype, RMNH-Coel. no. 31508.

OTHER MATERIAL EXAMINED. — **Loyalty Islands.** BIOGEOCAL, stn CP 290, 20°36.01'-20°37.26'S, 167°03.34'-

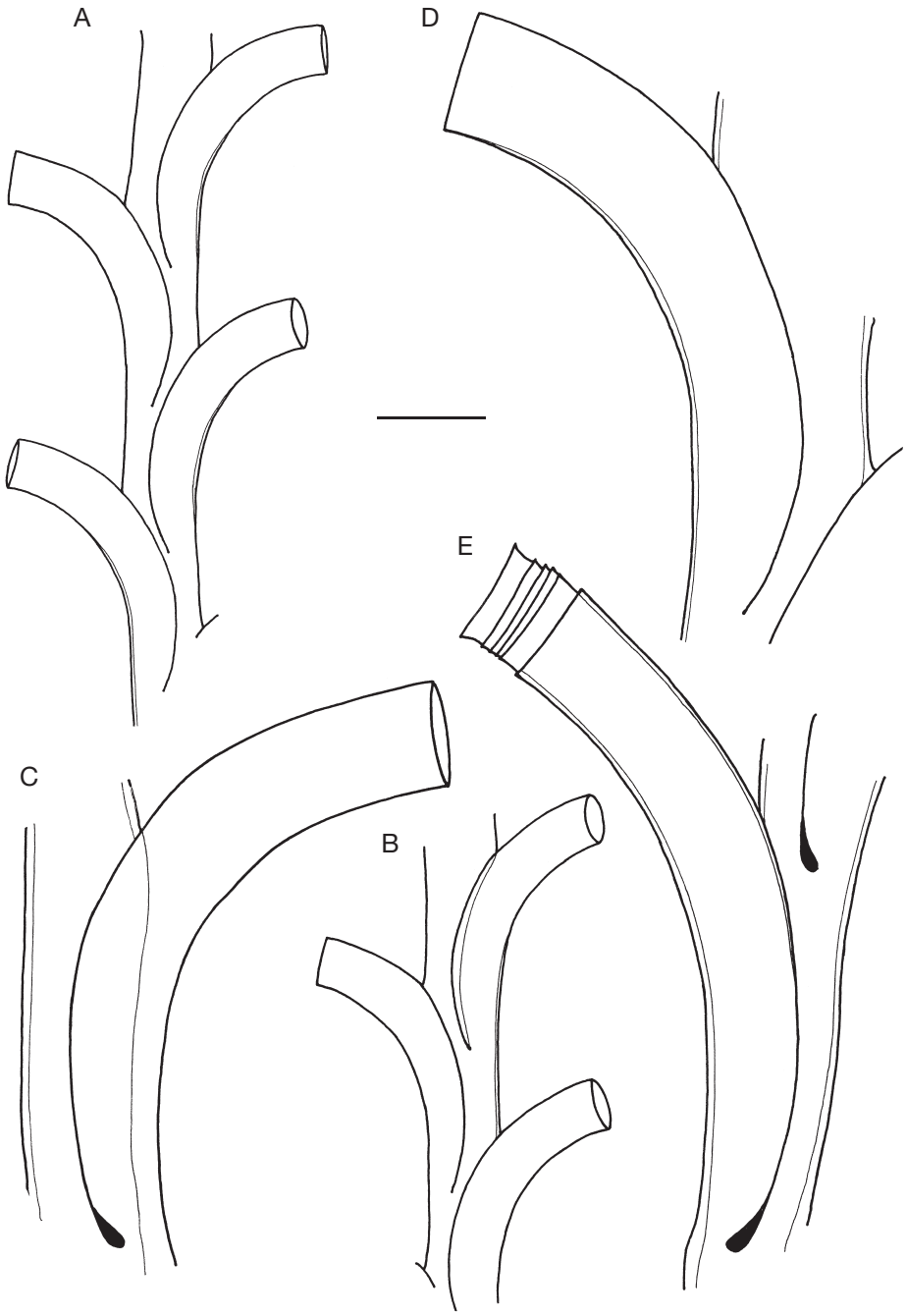

FIG. 8. — *Acryptolaria encarnae* n. sp.: **A**, **B**, branch fragments showing hydrothecal arrangement; **C**-**E**, hydrothecae; **A**-**D**, from MUSORSTOM 6 stn CP 464; **E**, from BIOCAL 1 stn DW 66. Scale bar: A, B, 600 µm; C-E, 250 µm.

TABLE 10. — Measurements of *Acryptolaria flabelloides* n. sp. (in µm).

	SMIB 4 stn DW 36		BIOCAL 1 stn DW 66	
	Range	**Mean ± SD (n)**	**Range**	**Mean ± SD (n)**
Hydrothecae				
Length of abcauline wall	825-900	867.2 ± 28.2 (9)	650-750	700.0 ± 50 (3)
Length of adcauline wall	940-1070	1019.4 ± 39.0 (9)	790-960	890.0 ± 72.6 (3)
Length of free adcauline wall	240-300	275.6 ± 20.1 (9)	250-330	290.0 ± 32.7 (3)
Length of adnate adcauline wall	700-790	743.9 ± 33.8 (9)	540-670	600.0 ± 53.5 (3)
Ratio adnate/free adcauline wall	2.3-2.9	2.7 ± 0.2 (9)	1.8-2.3	2.1 ± 0.2 (3)
Diameter at aperture	110-130	116.7 ± 7.8 (9)	110-120	113.3 ± 4.7 (3)
Gonothecae				
Maximum diameter	*c.* 100		*c.* 100	
Length of funnel	*c.* 70		*c.* 50	
Diameter at aperture	40-50		35-45	
Nematocysts				
Larger group	17-19 × 6-7	17.9 ± 0.7 × 6.5 ± 0.4 (10)	17-19.5 × 6-7	17.9 ± 0.8 × 6.6 ± 0.4 (10)
Ratio	2.6-3.2	2.8 ± 0.2 (10)	2.4-3.3	2.7 ± 0.3 (10)
Smaller group	7.5 × 3.5			

167°03.60'E, 920-760 m, 27.IV.1987, several fragments up to 12 mm long, 2 slides (MNHN-Hy.2009-0151; MNCN 2.03/394).

Norfolk Ridge. BIOCAL 1, stn DW 66, 24°55.435'-24°54.849'S, 168°21.678'-168°21.995'E, 515-505 m, 3.IX.1985, 2 stems 40 and 30 mm high, with coppinia (MNCN 2.03/415). — Stn CP 67, 24°55.443'-24°54.176'S, 168°21.550'-168°21.978'E, 500-510 m, 3.IX.1985, many stems up to 60 mm high, with coppinia (MNHN-Hy.2009-0193 and RMNH-Coel. no. 31507). — Stn CP 68, 24°00.374'-24°01.383'S, 168°07.031'-168°06.579'E, 1430-1470 m, 3.IX.1985, 1 stem *c.* 65 mm high (MNHN-Hy.2009-0194); 1 basally broken stem *c.* 30 mm high (RMNH-Coel. no. 37559, slide 418).

ETYMOLOGY. — The specific name "*flabelloides*" makes reference to the close resemblance of this species to *Acryptolaria flabellum* (Allman, 1888).

ECOLOGY AND DISTRIBUTION. — *Acryptolaria flabelloides* n. sp. comes from the Loyality Islands and the Norfolk Ridge area; it was collected at depths between 500 and 1470 m. Coppiniae were found in March and September.

DESCRIPTION

Stems up to 65 mm high. Branching frequent, approximately in one plane and irregular in general, though clearly alternate in some areas (Fig. 31F). Main stem distinct, with many short primary branches; a few of these strongly developed and giving rise to lower-order branches (up to third-order branches present). No anastomoses. Branches straight, but distinctly widening at the point where hydrotheca becomes free (Fig. 9A-C).

Hydrothecae alternately arranged in approximately one plane (Fig. 9A, B), cylindrical, with approximately a constant diameter throughout, only decreasing at their base (Fig. 9A-C). Basal part of hydrotheca parallel to branch or slightly directed outwards; distal part strongly curved outwards. Adcauline wall adnate in almost three-fourths of its length (adnate/free ratio 2.7). Adcauline wall convex throughout; slightly at basal half, but strongly at distal half. Abcauline wall straight at basal half and concave in distal half. Abcauline wall with strongly developed perisarc reaching hydrotheca situated below. Hydrothecal aperture circular and directed outwards, almost parallel to long axis of branch; rim even, sometimes with short renovations.

Large nematocysts relatively small and fusiform (Fig. 30).

Coppinia *c.* 7 mm long and 3 mm maximum diameter. Gonothecae closely set together (Fig. 9D-F), forming a mosaic in dorsal view, each with a short distal neck with a circular aperture (Fig. 9D-F). Gonothecae empty. Coppinia either with (Fig. 9E, F) or without defensive tubes (Fig. 9D).

FIG. 9. — *Acryptolaria flabelloides* n. sp.: **A**, branch fragment showing hydrothecal arrangement; **B**, **C**, hydrothecae; **D**, part of coppinia lacking defensive tubes; **E**, **F**, part of coppinia with defensive tubes; **A**, **B**, **D**, from SMIB 4 stn DW 36; **C**, **E**, **F**, from BIOCAL 1 stn DW 66. Scale bar: A, 600 µm; B-F, 250 µm.

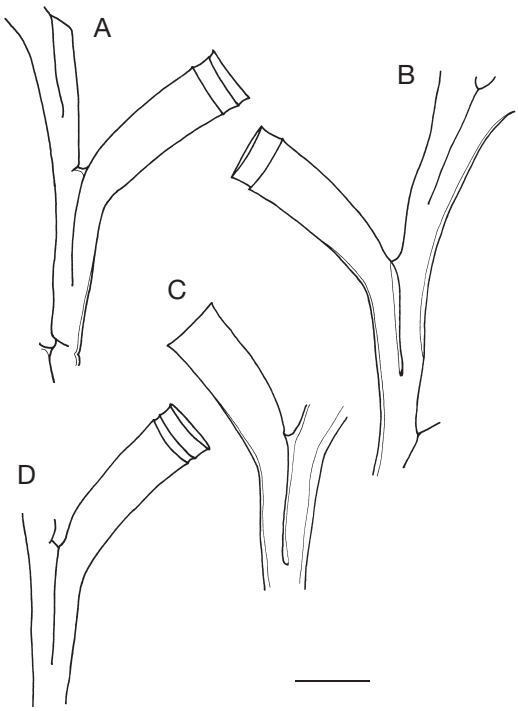

FIG. 10. — *Acryptolaria gemini* n. sp., from GEMINI stn DW 60: **A**, **B**, branch fragments showing hydrothecal arrangement; **C**, **D**, hydrothecae. Scale bar: 250 µm.

REMARKS

The material from BIOCAL 1 stn DW 66 and BIOCAL 1 stn CP 67 differs from the material from SMIB 4 stn DW 36 in the presence of forked defensive tubes in the coppinia. In the remaining characters they are in general agreement. The hydrothecae are only slightly smaller and have a slightly longer free portion, but the size of the nematocysts is identical (cf. Table 10). Also the general shape and size of the gonothecae is similar and the presence/absence of defensive tubes in the coppinia could be due to sexual dimorphism or other reasons (e.g., presence of predators).

Acryptolaria flabelloides n. sp. is close to *A. flabellum* in structure of the colony as well as in shape and size of the hydrothecae. Peña Cantero *et al.* (2007) re-described the holotype of Allman's species, which is scarce, sterile and poorly preserved. These authors could only find a single questionable nematocyst as the type material was deprived of coenosarc, so that the crucial cnidome information, necessary to properly assign new material to *A. flabellum*, is unknown. Allman's species must be regarded as an insufficiently known species and, consequently, we have decided to consider our material, abundant, fertile, in good condition and well characterized as a new species. In addition, there are a few differences between them. The hydrothecae are thinner in *A. flabelloides* n. sp. (e.g., the diameter at rim is 136-160 µm in Allman's material). The putative nematocyst found by Peña Cantero *et al.* (2007) is smaller than those in *A. flabelloides* n. sp. *Acryptolaria flabellum* was also characterized by the high number of renovations of the hydrothecal aperture (up to 90) and by the longitudinally striated hydrothecal perisarc.

Acryptolaria gemini n. sp.
(Figs 10; 30; 31G; Table 11)

TYPE MATERIAL. — **Vanuatu.** Gemini Seamount, GEMINI, stn DW 60, 20°59.9'S, 170°16.6'E, 190 m, 6.VII.1989 1 broken stem *c.* 45 mm high, holotype (MNHN-Hy.2009-0161); 1 stem and several fragments, paratype (RMNH-Coel. no. 31511).

ETYMOLOGY. — The specific name "*gemini*" has been taken from the locality, the Gemini Seamount; it is a noun in apposition.

ECOLOGY AND DISTRIBUTION. — *Acryptolaria gemini* n. sp. was collected at a depth of 190 m in the remote Gemini Seamounts area (20°59.9'S, 170°16.6'E).

DESCRIPTION OF THE HOLOTYPE

Stem *c.* 45 mm high, broken into three main stem fragments. Hydrorhiza dish-shaped. Branching frequent and irregular, more or less in one plane, though secondary branches may arise in several planes (Fig. 31G). The stem gives rise to several primary branches, some of which get much developed and form a few second-order branches; secondary branches quite distal. Branches approximately straight (Fig. 10A, B).

Hydrothecae alternately arranged and roughly in one plane (Fig. 10A, B). Hydrotheca horn-shaped (Fig. 10); diameter progressively decreasing from ap-

TABLE 11. — Measurements of *Acryptolaria gemini* n. sp. from the holotype (in µm).

	Range	Mean ± SD (n)
Hydrothecae		
Length of abcauline wall	810-870	846 ± 21.9 (5)
Length of adcauline wall	935-990	969 ± 20.4 (5)
Length of free adcauline wall	525-570	552 ± 18.9 (5)
Length of adnate adcauline wall	400-450	417 ± 19.2 (5)
Ratio adnate/free adcauline wall	0.7-0.8	0.8 ± 0.1 (5)
Diameter at aperture	200-220	211 ± 8.9 (5)
Nematocysts		
Larger group	16-19 × 5.5-6	18.1 ± 1.0 × 5.7 ± 0.3 (10)
Ratio	2.9-3.4	3.2 ± 0.2 (10)
Smaller group	7 × 3	

TABLE 12. — Measurements of *Acryptolaria infinita* n. sp. from the holotype (in µm).

	Range	Mean ± SD (n = 10)
Hydrothecae		
Length of abcauline wall	2400-2960	2698.0 ± 196.8
Length of adcauline wall	2470-3110	2784.0 ± 201.7
Length of free adcauline wall	1500-2200	1854.0 ± 215.3
Length of adnate adcauline wall	810-1020	930.0 ± 72.9
Ratio adnate/free adcauline wall	0.4-0.7	0.5 ± 0.1
Diameter at aperture	300-360	336.0 ± 25.4
Nematocysts		
Larger group	14-15.5 × 7-8.5	14.8 ± 0.5 × 8.1 ± 0.8
Ratio	1.4-2.1	1.9 ± 0.2
Smaller group	7 × 3	

erture, where it is maximal, to base, but with a sharp reduction at the point where the hydrotheca becomes adnate. Hydrotheca sharply directed outwards; adcauline wall free for more than half its length (adnate/free ratio 0.8). Free portion of adcauline wall slightly convex, adnate part roughly straight. Abcauline wall concave in general, but straight at basal and distal parts. Hydrothecal aperture circular, directed upwards, forming an angle of *c.* 40° with longitudinal axis of branch. Rim even, usually with renovations.

Large nematocysts relatively small and fusiform (Fig. 30).

Coppinia not observed.

REMARKS

Acryptolaria gemini n. sp. closely resembles *A. longitheca* (Allman, 1877). The similarities and differences will be discussed below, when dealing with the latter.

Acryptolaria infinita n. sp.
(Figs 11; 30; 31H; Table 12)

TYPE MATERIAL. — **NW New Caledonia.** MUSORSTOM 4, stn DW 197, 18°51.3'S, 163°21.0'E, 560 m, 20.IX.1985, several stems up to 70 mm high and a few stolonal hydrothecae, on coral, holotype (MNHN-Hy.2009-0162); *c.* 4 stems on coral fragments, up to 60 mm high, paratype (RMNH-Coel. no. 31509); 3 stem fragments up to 27 mm high in 2 slides, paratypes (RMNH-Coel no. 35004, slide 431; MNCN 2.03/395).

OTHER MATERIAL EXAMINED. — **NW New Caledonia.** MUSORSTOM 4, stn DW 162, 18°35.0'S, 163°10.3'E, 525 m, 16.IX.1985, 1 stem *c.* 46 mm high (MNCN 2.03/416).

ETYMOLOGY. — The specific name "*infinita*" refers to the exceedingly long hydrothecae. From the Latin "finis", border, the Latin word "in" indicating without; "infinita" is an adjective in feminine gender.

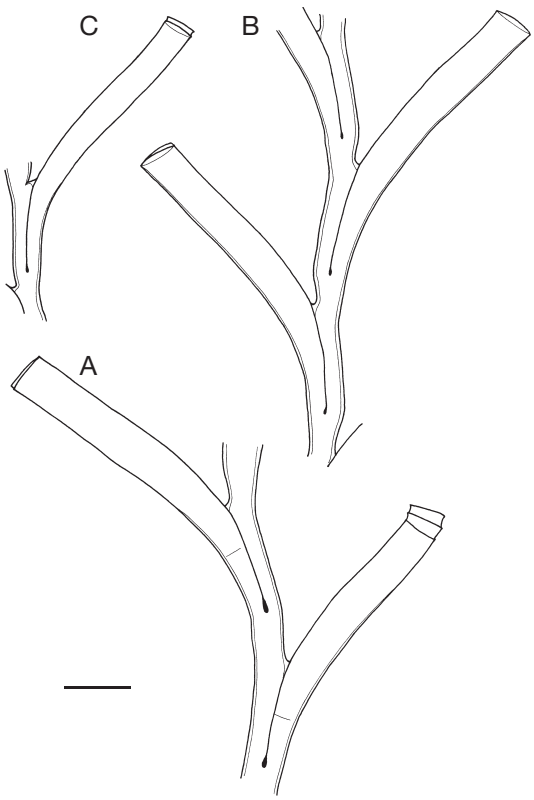

FIG. 11. — *Acryptolaria infinita* n. sp.: **A**-**C**, branch fragments showing hydrothecal arrangement and hydrothecae; **A**, **B**, from MUSORSTOM 4 stn DW 197; **C**, from MUSORSTOM 4 stn DW 162. Scale bar: 600 µm.

ECOLOGY AND DISTRIBUTION. — *Acryptolaria infinita* n. sp. was collected at depths between 525 and 560 m in the Pacific Ocean NW of New Caledonia. It was found epibiotic on coral.

DESCRIPTION

Stems up to 70 mm high, scarcely branched (Fig. 31H), usually with only secondary branches, but up to fourth-order branches have been observed. Branching irregular; branches sinuous, forming a moderate zigzag (Fig. 11A, B).

Hydrothecae alternately arranged in approximately one plane (Fig. 11A, B); tubular (Fig. 11), roughly cylindrical at long free part, but diameter distinctly decreasing basally at adnate basal third; minimum diameter at base. Hydrotheca slightly directed outwards, adnate for approximately one-third of the adcauline wall (adnate/free ratio 0.5). Distal part of hydrotheca predominantly straight. Adcauline wall slightly convex at adnate part, straight or slightly convex at free portion; abcauline wall slightly concave basally, straight at distal part. Hydrothecal aperture circular, oblique and upward directed, forming an angle of *c.* 45° with long axis of internode. Rim even, frequently with a few short renovations (Fig. 11).

Large nematocysts relatively small and ovoid (Fig. 30).

Coppinia not found.

REMARKS

Acryptolaria infinita n. sp. is unique and easily recognizable by the colony structure, with little branched stems and branches with a moderate zigzag pattern, by the extremely long hydrothecae (the longest known), the shape of that hydrotheca, the relatively large free part of the adcauline hydrothecal wall and the relatively small nematocysts.

Acryptolaria intermedia n. sp.
(Figs 12; 30; 31I; Table 13)

TYPE MATERIAL. — **Norfolk Ridge**. CHALCAL 2, stn DW 76, 23°40.50'S, 167°45.20'E, 470 m, 30.X.1986, several stems, up to 24 mm high, from communal stolonal fibers: 1 stem holotype (MNHN-Hy.2009-0163); several stems paratype (RMNH-Coel. no. 31510).

ETYMOLOGY. — The specific name "*intermedia*" refers to the presence of intermediate features between *A. angulata* and *A. bulbosa*; it is an adjective in femine gender.

ECOLOGY AND DISTRIBUTION. — *Acryptolaria intermedia* n. sp. was collected at a depth of 470 m in the Norfolk Ridge area.

DESCRIPTION

Stems up to 24 mm high (Fig. 31I). Branching irregular, but usually in one plane, and scarce, though branches up to third order are present. Branches straight or slightly sinuous (Fig. 12A, B), with anastomoses.

Hydrothecae alternately arranged in one plane (Fig. 12A, B), tubular, roughly cylindrical, with a distinct decrease in diameter at their base (Fig. 12). Hydrotheca curved twice: strongly outwards at

TABLE 13. — Measurements of *Acryptolaria intermedia* n. sp. from the holotype (in µm).

	Range	Mean ± SD (n = 10)
Hydrothecae		
Length of abcauline wall	490-600	547.5 ± 33.4
Length of adcauline wall	550-690	621.5 ± 39.2
Length of free adcauline wall	190-270	235.5 ± 24.1
Length of adnate adcauline wall	360-420	386.0 ± 18.1
Ratio adnate/free adcauline wall	1.4-1.9	1.7 ± 0.1
Diameter at aperture	95-110	102.5 ± 4.0
Nematocysts		
Larger group	8.5-10 × 6-6.5	9.1 ± 0.4 × 6.1 ± 0.2
Ratio	1.4-1.5	1.48 ± 0.04
Smaller group	5.5 × 2.5	

distal part of adnate portion, becoming more or less perpendicular to adnate part, and markedly upwards consecutively, usually shortly after the adnate wall becomes free. Abcauline wall with a distinct inflexion point at about half its length, forming a shallow embayment at that point, accompanied by an internal perisarc cusp (Fig. 12). Basal part of abcauline wall straight, parallel to branch; distal part slightly convex or straight too. Adcauline wall adnate for over half of its length (adnate/free ratio *c.* 1.7); adnate part convex; free part concave proximally becoming straight distally. Hydrothecal aperture circular, oblique and slightly directed upwards; rim even, sometimes with renovations.

Large nematocysts relatively very small and spherical (Fig. 30).

Coppinia not observed.

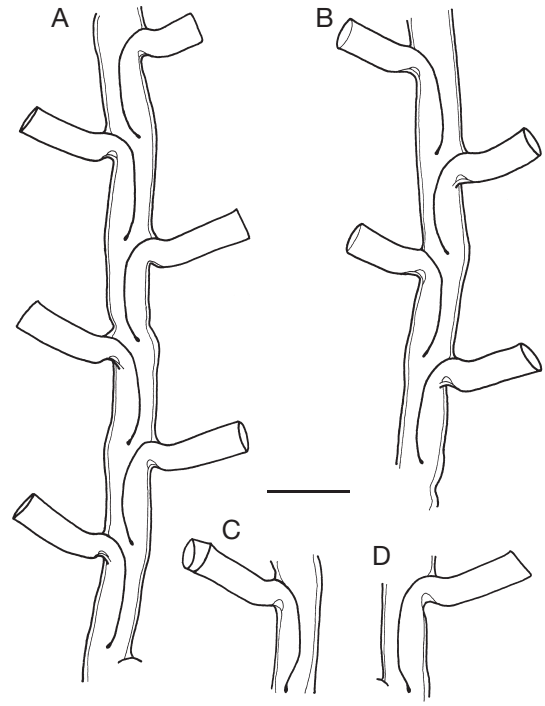

FIG. 12. — *Acryptolaria intermedia* n. sp., from CHALCAL 2 stn DW 76: **A**, **B**, branch fragments showing hydrothecal arrangement and hydrothecae; **C**, **D**, hydrothecae. Scale bar: 250 µm.

REMARKS

At first glance, *Acryptolaria intermedia* n. sp. resembles *A. bulbosa* in the shape of the hydrothecae. Nevertheless they are clearly different species as the latter has bigger hydrothecae, much bigger nematocysts (20.7 × 6.7 µm) and the internal perisarc cusp at the abcauline hydrothecal embayment is absent. In the size of the nematocysts, *A. intermedia* n. sp. is closer to *A. angulata* (15.9 × 8.6 µm), but they differ in the shape and size of the hydrotheca; *A. intermedia* n. sp. lacks the characteristic sharp invagination of the adnate adcauline wall of *A. angulata* and has distinctly smaller hydrothecae (cf. Table 31).

Above, when dealing with *A. bulbosa*, we have indicated that material described either as *A. rectangularis* (cf. Gravier-Bonnet 1979; Millard 1967, 1968) or as *A. angulata* (cf. Hirohito 1995) could belong to *A. bulbosa* or to *A. intermedia* n. sp. but that it is necessary to study the cnidome to properly identify this material.

Acryptolaria inversa n. sp.
(Figs 13; 30; 31J; Table 14)

TYPE MATERIAL. — **Loyalty Islands.** MUSORSTOM 6, stn DW 476, 21°09.36'S, 167°56.40'E, 300 m, 22.II.1989, 1 stem *c.* 53 mm high with coppinia, holotype (MNHN-Hy.2009-0164); 1 fragment *c.* 24 mm long, paratype (RMNH-Coel. no. 35130, slide 692).

OTHER MATERIAL EXAMINED. — **New Caledonia.** DRAGUE 3, New Caledonia area, exact position unknown, 1 fragment *c.* 38 mm long.
Loyalty Islands. MUSORSTOM 6, stn DW 391, 20°47.35'S, 167°05.70'E, 390 m, 13.II.1989, 3 stems up to 41 mm high on sponge, with coppinia (MNCN 2.03/417). — Stn DW 398, 20°47.19'S, 167°05.65'E, 370 m, 13.II.1989, 1 stem *c.* 80 mm high (RMNH-Coel. no. 31513). — Stn DW 399, 20°41.80'S, 167°00.20'E, 282 m, 14.II.1989, 7 stems up to 35 mm high, on coral (MNHN-Hy.2009-0195); 1 fragment *c.* 21 mm long (slide MNHN-Hy.2009-0152). — Stn DW 422, 20°26.20'S, 166°40.31'E, 257 m, 16.II.1989, 8 stems up to 40 mm high, with coppinia (RMNH-Coel. no. 31514). — Stn DW 423, 20°25.85'S, 166°40.50'E, 280 m, 16.II.1989, 1 stem *c.* 28 mm high on coral (MNCN 2.03/418). — Stn DW 424, 20°24.30'S-166°24.70'E, 599 m, 17.II.1989, 1 stem *c.* 30 mm high (MNHN-Hy.2009-0196). — Stn CP 464, 21°02.30'S, 167°31.60'E, 430 m, 21.II.1989, 1 stem *c.* 35 mm high (MNCN 2.03/419). — Stn DW 477, 21°07.98'S, 167°54.69'E, 550 m, 22.II.1989, 1 fragment *c.* 32 mm long in slide (MNCN 2.03/396).

ETYMOLOGY. — The specific name "*inversa*" refers to the downwards growth of part of the hydrotheca. It is an adjective in feminine gender. From the Latin noun "inversio", reverse.

ECOLOGY AND DISTRIBUTION. — *Acryptolaria inversa* n. sp. comes from the Loyalty Islands where it was collected at depths from 257 to 599 m, being epibiotic on corals and sponges. Coppiniae were found in February. One sample originates from an uncertain locality in the New Caledonian area.

DESCRIPTION
Stems up to 80 mm high. Branching scarce (Fig. 31J) and irregular, but more or less in one plane; branches straight (Fig. 13A).

Hydrothecae alternately arranged, approximately in one plane (Fig. 13A); mainly cylindrical (Fig. 13A-C), diameter only decreasing clearly in their basal part and distinctly increasing at the hump. Hydrotheca twice strongly curved: markedly curved downwards at approximately basal third and frequently being parallel to the adnate part for a short distance (Fig. 13C) after which it turns upwards at about the middle of the adcauline wall (Fig. 13A-C). Adcauline wall extremely convex at basal half, with a strongly marked inflexion point at the middle of the adcauline length where it is concave (Fig. 13A-C). Distal third of adcauline wall more or less straight. Abcauline wall straight at basal fourth, parallel to branch, then strongly curved outwards and downwards, forming a distinct hump (Fig. 13A-C); later on abcauline wall becoming convex and finally straight (Fig. 13A-C). The hump of the abcauline wall may be free (Fig. 13C), but it is usually in contact with the basal portion of the abcauline wall and frequently both parts are fused (Fig. 13A, B). Adcauline wall free from internode for almost two-thirds of its length (adnate/free ratio *c.* 0.7). Hydrothecal aperture circular, oblique, upwardly directed. Rim even, frequently with renovations (up to 10) (Fig. 13C).

Large nematocysts relatively small and fusiform (Fig. 30).

Coppinia fusiform, 5 mm long and about 2 mm in diameter, deprived of defensive tubes (Fig. 13D). Gonothecae bottle-shaped, diameter increasing from basal part to approximately two-thirds of their length, then decreasing to form a fairly long neck provided with a distal, circular aperture (Fig. 13D). Rim even, but frequently provided with one or two renovations (Fig. 13D). Gonothecae closely set, walls fused for about two-thirds of gonothecal height.

REMARKS
Acryptolaria inversa n. sp. is easily recognizable by the peculiar shape of the hydrotheca, partially directed downwards, frequently even becoming parallel to the adnate part and then running obliquely upwards. They are provided with a large abcauline hump which may be fused with the basal part of the abcauline wall.

Acryptolaria laertesi n. sp.
(Figs 14; 30; 31K; Table 15)

TYPE MATERIAL. — **Loyalty Islands.** MUSORSTOM 6, stn DW 425, 20°24.30'S, 166°24.80'E, 594 m, 17.II.1989,

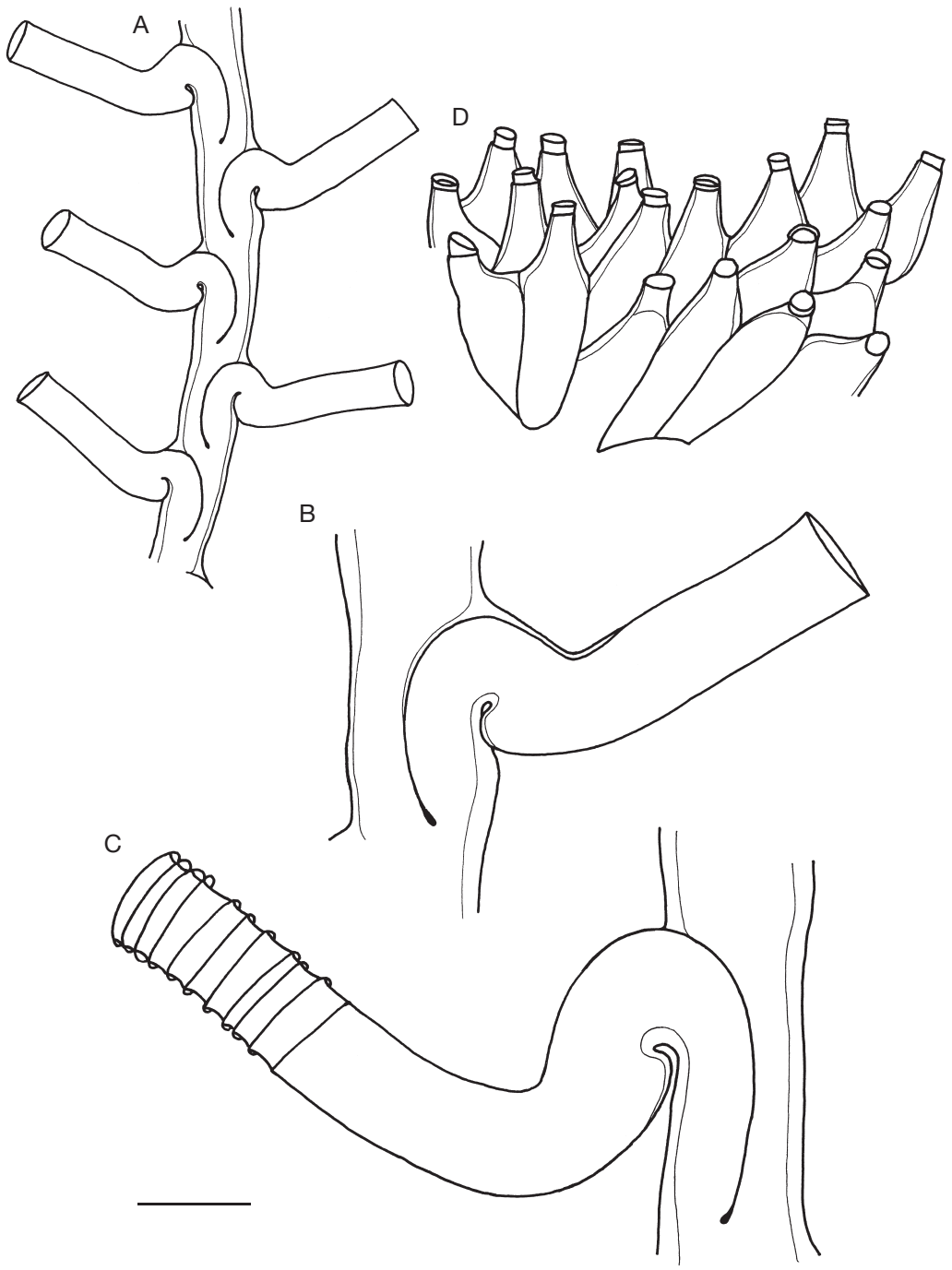

FIG. 13. — *Acryptolaria inversa* n. sp.: **A**, branch fragment showing hydrothecal arrangement; **B**, **C**, hydrothecae; **D**, coppinia fragment showing gonothecae; **A**, **B**, from MUSORSTOM 6 stn DW 422; **C**, **D**, from MUSORSTOM 6 stn DW 476. Scale bar: A, 600 µm; B-D, 250 µm.

TABLE 14. — Measurements of *Acryptolaria inversa* n. sp. (in µm). Hydrothecae from MUSORSTOM 6 stn DW 422; gonothecae and nematocysts from the holotype; whole range from several stations.

	Range	Mean ± SD (n)	Whole range (n = 14)
Hydrothecae			
Length of abcauline wall	1200-1400	1316.3 ± 56.0 (8)	1200-1800
Length of adcauline wall	1360-1580	1435.0 ± 65.2 (8)	1360-1950
Length of free adcauline wall	700-930	826.3 ± 73.1 (8)	700-1220
Length of adnate adcauline wall	560-660	608.8 ± 41.6 (8)	560-950
Ratio adnate/free adcauline wall	0.7-0.9	0.7 ± 0.1 (8)	0.5-1.3
Diameter at aperture	210-245	228.8 ± 14.3 (8)	200-250
Gonothecae			
Length	*c.* 500		
Maximum diameter	*c.* 170		
Diameter at aperture	50-70		
Nematocysts			
Larger group	16-18 × 4.5-5	17.2 ± 0.9 × 4.8 ± 0.3 (10)	
Ratio	3.5-3.8	3.6 ± 0.1 (10)	
Smaller group	7 × 2.5		

TABLE 15. — Measurements of *Acryptolaria laertesi* n. sp. from the holotype (in µm).

	Range	Mean ± SD (n)
Hydrothecae		
Length of abcauline wall	1550-1700	1628.3 ± 50.1 (6)
Length of adcauline wall	1740-2000	1865 ± 77.4 (6)
Length of free adcauline wall	750-1000	876.7 ± 85.0 (6)
Length of adnate adcauline wall	940-1100	988.3 ± 53.7 (6)
Ratio adnate/free adcauline wall	1-1.5	1.1 ± 0.2 (6)
Diameter at aperture	260-280	266.7 ± 9.4 (6)
Nematocysts		
Larger group	27-31 × 7-7.5	29.5 ± 1.2 × 7.2 ± 0.2 (10)
Ratio	3.7-4.4	4.1 ± 0.2 (10)
Smaller group	6.5 × 2.5	

1 stem *c.* 75 mm high, holotype (MNHN-Hy.2009-0165); 1 stem fragment *c.* 20 mm high, paratype (RMNH-Coel. no. 35137, slide 699).

ETYMOLOGY. — The specific name "*laertesi*" is a dedication to Laertes Peña Sancho, son of the first author; it is a noun in genitive singular.

ECOLOGY AND DISTRIBUTION. — *Acryptolaria laertesi* n. sp. was collected at a depth of 594 m in the Loyalty Islands area.

DESCRIPTION

Stem *c.* 75 mm high. Branching irregular and scarce (Fig. 31K); only seven, very short (up to 8 mm long) primary branches present. Branches roughly straight, with an almost unnoticeable zigzag (Fig. 14A).

Hydrothecae alternately arranged in two planes forming an obtuse angle (Fig. 14A); approximately cylindrical, but with a clear decrease of diameter at basal adnate part (Fig. 14); minimum diameter at base. Distal part of hydrotheca practically straight. Hydrotheca strongly curved outwards, adnate for about half of its adcauline length (adnate/free ratio 1.1). Adcauline wall convex, straight at distal part; abcauline wall broadly concave, straight at distal part. Hydrothecal aperture circular, oblique and directed upwards, forming an angle of *c.* 30° with long axis of branch. Rim even, with numerous renovations (up to 12).

Large nematocysts relatively very large and fusiform (Fig. 30).

Coppinia not observed.

REMARKS

Acryptolaria laertesi n. sp. is easily recognizable by the colony structure, with just a few short primary branches and by shape and size of both hydrothecae and nematocysts. *Acryptolaria laertesi* n. sp. has extremely long and thin nematocysts (ratio 4.1). It has in fact the longest nematocysts in the genus *Acryptolaria*, together with *A. tortugasensis*, though in this species they are wider (29.3 × 9.9 µm).

Acryptolaria laertesi n. sp. resembles *A. encarnae* n. sp. in the shape of the hydrothecae, but in the latter the hydrothecae are broadly cylindrical, slightly smaller, more strongly directed outwards and free for a smaller proportion. Moreover, in *A. encarnae* n. sp. the branches are straight and the large type of nematocysts is much smaller (19.9 × 7.5 µm).

In the shape of the hydrothecae, *A. laertesi* n. sp. approaches *A. corniformis*, but in the latter the hydrothecae are much larger and less curved outwards. Moreover, it has much smaller nematocysts (12.3 × 4.3 µm in the holotype).

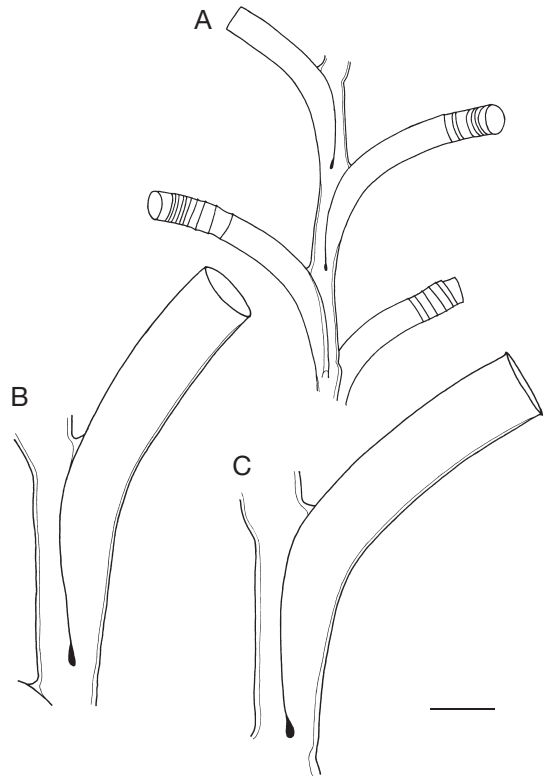

FIG. 14. — *Acryptolaria laertesi* n. sp., from MUSORSTOM 6 stn DW 425: **A**, branch fragment showing hydrothecal arrangement; **B**, **C**, hydrothecae. Scale bar: A, 600 µm; B, C, 250 µm.

Acryptolaria longitheca (Allman, 1877)
(Figs 15; 30; 32A; Table 16)

Cryptolaria longitheca Allman, 1877: 18-20, pl. 13, figs 4, 5.

Acryptolaria longitheca – Peña Cantero *et al.* 2007: 252-254, figs 9, 16A, 18B, tab. IX.

MATERIAL EXAMINED. — **Loyalty Islands.** BIOCAL 1, stn DW 82, 20°30.658'-20°30.888'S, 167°50.308'-167°50.367'E, 440-460 m, 6.IX.1985, several stems up to 20 mm high on coral (MNHN-Hy.2009-0197); 1 stem *c.* 16 mm high (MNHN-Hy.2009-0153, slide).
MUSORSTOM 6, stn DW 406, 20°40.65'S, 167°06.80'E, 373 m, 15.II.1989, 1 stem *c.*18 mm high on tube of benthic organism (MNCN 2.03/420). — Stn DW 407, 20°40.70'S, 167°06.60'E, 360 m, 15.II.1989, 3 stems up to 70 mm high (RMNH-Coel. no. 31515); 1 basally broken stem *c.* 20 mm high (RMNH-Coel. no. 35161, slide 727). — Stn DW 422, 20°26.20'S, 166°40.31'E, 257 m, 16.II.1989, 2 fragments up to 11 mm long (RMNH-Coel. no. 31516). — Stn CP 464, 21°02.30'S, 167°31.60'E, 430 m, 21.II.1989, several stems up to 10 mm high on worm tube (MNCN 2.03/421). — Stn DW 471, 21°08.00'S, 167°54.10'E, 460 m, 22.II.1989, several stems up to 28 mm high on coral, with coppinia (MNHN-Hy.2009-0198).

Norfolk Ridge. BIOCAL 1, stn DW 66, 24°55.435'-24°54.849'S, 168°21.678'-168°21.995'E, 515-505 m, 3.IX.1985, 4 stems up to 31 mm high (RMNH-Coel no. 31517); 1 incipient stem *c.* 10 mm high (RMNH-Coel. no. 35229, slide 813).
SMIB 4, stn DW 39, 24°56.2'-24°55.4'S, 168°21.5'-168°21.5'E, 525-560 m, 7.III.1989, one stem *c.* 25 mm high in slide (MNCN 2.03/397). — Stn DW 50, 23°42.4'-23°41.6'S, 168°00.8'-168°00.6'E, 260-295 m, 9.III.1989, 1 stem *c.* 23 mm high (MNHN-Hy.2009-0199); 1 basally broken stem *c.* 20 mm high (MNHN-Hy.2009-0154, slide). — Stn DW 55, 23°21.4'-23°21.4'S, 168°04.5'-168°04.8'E, 215-260 m, 9.III.1989, 1 stem *c.* 6 mm high on coral (MNCN 2.03/422).
SMIB 5, stn DW 72, 23°42.0'S, 168°00.8'E, 400 m, 7.IX.1989, 2 fragments up to 11 mm long (MNCN 2.03/423).

ECOLOGY AND DISTRIBUTION. — Western Atlantic, off Double-Headed Shot Key, 567 m (Allman 1877). Our material was collected at depths between 215 and 560 m

TABLE 16. — Measurements of *Acryptolaria longitheca* (Allman, 1877) from several stations (in µm).

	Range	Mean ± SD (n)
Hydrothecae		
Length of abcauline wall	950-1350	1118.6 ± 125.4 (14)
Length of adcauline wall	1050-1490	1278.2 ± 138.3 (14)
Length of free adcauline wall	520-920	690.0 ± 139.9 (14)
Length of adnate adcauline wall	440-750	588.2 ± 84.7 (14)
Ratio adnate/free adcauline wall	0.5-1.3	0.9 ± 0.2 (14)
Diameter at aperture	215-270	237.5 ± 17.3 (14)
Gonothecae		
Maximum diameter	*c.* 200	
Length of funnel	*c.* 50	
Diameter at aperture	70-80	
Nematocysts		
Larger group	21.5-26 × 6.5-8	24.2 ± 1.1 × 7.3 ± 0.4 (26)
Ratio	2.9-3.7	3.3 ± 0.2 (26)
Smaller group	7-8 × 3-3.5	

in the Loyalty Islands and Norfolk Ridge areas. It grows epibiotic on corals and tubes of benthic organisms. The colony with coppinia was collected in February.

DESCRIPTION

Stems up to 70 mm high, though usually smaller. Branching frequent (up to fifth-order branches observed) and irregular in either one or several planes, sometimes alternate (Fig. 32A). There may be anastomoses. Branches show slight zigzag (Fig. 15A).

Hydrothecae alternately arranged and roughly in one plane (Fig. 15A), horn-shaped (Fig. 15A-C); diameter at free part either constant or slightly decreasing basally, then sharply decreasing where hydrotheca becomes adnate and from there on smoothly decreasing downwards. Hydrotheca sharply bent outwards. Adcauline wall adnate for less than half its length (adnate/free ratio 0.9). Free portion of adcauline wall straight or slightly convex, adnate part initially convex but straight basally. Abcauline wall concave in general, but straight at basal and distal parts. Hydrothecal aperture circular, directed upwards, forming an angle of *c.* 40° with longitudinal axis of internode. Rim flared in young hydrothecae, but not everted and with many renovations in the oldest ones (Fig. 15A, B).

Large nematocysts relatively large and fusiform (Fig. 30).

Coppinia deprived of defensive tubes (Fig. 15D); gonothecae closely set, with coalesced walls, bottle-shaped with a short and wide distal neck with a circular aperture (Fig. 15D).

REMARKS

Our material undoubtedly belongs to this species, sharing the colony structure, with slightly geniculate stems, the shape and size of the hydrothecae and the size of the nematocysts. Peña Cantero *et al.* (2007) give a redescription of the type material and full discussion of the species including their arguments to consider *A. longitheca* a valid and well-characterized species and outlining the differences with the allied species. They also consider Clarke's (1879) record valid, because of the complete agreement with the holotype in the shape and size of the hydrothecae. Clarke also recorded coppiniae whose structure is similar to those found in our material giving additional support to the opinion expressed by the authors. Nevertheless, without having information on the cnidome of Clarke's material, we consider it risky to consider Clarke's material conspecific with ours, especially after the discovery of *A. gemini* n. sp. *Acryptolaria longitheca* is closely similar to *A. gemini* n. sp. in the general appearance of the hydrotheca, in the way they are abruptly directed outwards and in the large proportion of the free adcauline wall. They differ, however, in the distinctly smaller size of both the hydrothecae and the nematocysts (18.1 × 5.7 µm) in *A. gemini* n. sp., as well as in the distinct adcauline

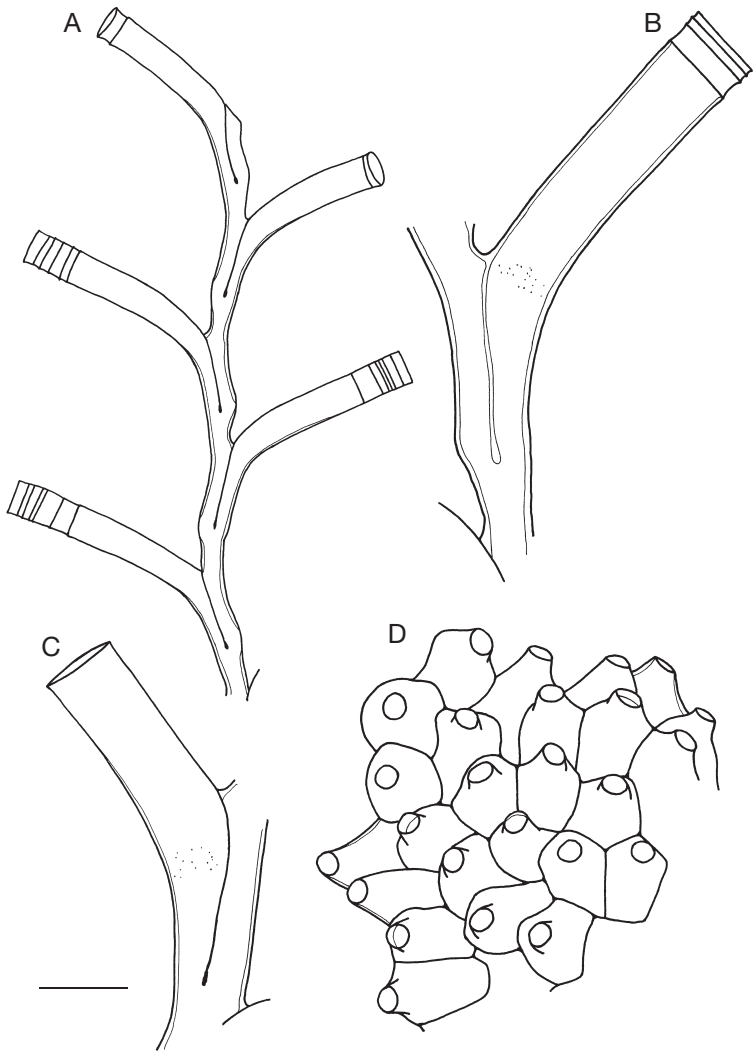

FIG. 15. — *Acryptolaria longitheca* (Allman, 1877): **A**, branch fragment showing hydrothecal arrangement; **B**, **C**, hydrothecae; **D**, coppinia fragment showing gonothecae; **A**, from SMIB 4 stn DW 39; **B**, from BIOCAL 1 stn DW 66; **C**, **D**, from MUSORSTOM 6 stn DW 471. Scale bar: A, 600 µm; B-D, 250 µm.

invagination of the hydrothecal wall just before becoming adnate.

Acryptolaria medeae n. sp.
(Figs 16; 30; 32B; Table 17)

TYPE MATERIAL. — **NW New Caledonia.** MUSORSTOM 4, stn CP 195, 18°54.8'S, 163°22.2'E, 465 m, 19.IX.1985, 1 stem 70 mm high, with coppinia, holotype (MNHN-Hy.2009-0166); 1 stem *c.* 23 mm high, paratype (RMNH-Coel. no. 31518).

OTHER MATERIAL EXAMINED. — Stn DW 197, 18°51.3'S, 163°21.0'E, 560 m, 20.IX.1985, 2 stems up to 80 mm high (MNCN 2.03/424).

ETYMOLOGY. — The specific name *medeae* is a dedication to Medea Peña Sancho, daughter of the first author; "medeae" is a noun in genitive singular.

TABLE 17. — Measurements of *Acryptolaria medeae* n. sp. from the holotype (in µm).

	Range	Mean ± SD (n)
Hydrothecae		
Length of abcauline wall	400-500	472.2 ± 32.2 (9)
Length of adcauline wall	550-615	592.8 ± 20.3 (9)
Length of free adcauline wall	135-180	163.9 ± 13.5 (9)
Length of adnate adcauline wall	370-450	428.9 ± 21.8 (9)
Ratio adnate/free adcauline wall	2.1-3.3	2.6 ± 0.3 (9)
Diameter at aperture	105-110	108.3 ± 2.4 (9)
Gonothecae		
Length	350-380	
Maximum diameter	up to 200	
Length of funnel	*c.* 100	
Diameter at aperture	40-50	
Nematocysts		
Larger group	17-20 × 7-8	18.7 ± 0.8 × 7.2 ± 0.3 (10)
Ratio	2.4-2.8	2.6 ± 0.1 (10)
Smaller group	5.5-6 × 2.5	

ECOLOGY AND DISTRIBUTION. — *Acryptolaria medeae* n. sp. was collected at depths between 465 and 560 m off NW New Caledonia.

DESCRIPTION

Palm-shaped stems up to 80 mm high (Fig. 32B), with the appearance of gorgonids and a disc-shaped hydrorhiza for attachment to hard substratum. Branching extremely abundant (up to sixth-order branches observed) and irregular, but strictly in one plane. Stem deprived of branches for the first few millimetres and then with continuous branching with numerous anastomoses, giving stems the aspect of a mesh. Branches slightly sinuous (Fig. 16A).

Hydrothecae alternately arranged in approximately one plane (Fig. 16A, B), almost cylindrical, but imperceptibly widening basally (Fig. 16A, B); later diameter sharply decreasing at hydrothecal base. Hydrotheca gently curved outwards; adcauline wall adnate to internode for over two-thirds of its length (adnate/free ratio 2.6), convex. Abcauline wall straight or convex at basal half, concave at distal half, with a strong development of the perisarc which is strongly reduced just over hydrotheca underneath (Fig. 16A, B). Hydrothecal aperture circular, oblique and directed upwards, forming an angle of *c.* 40° with long axis of branches. Rim even, sometimes with short renovations (up to 13 observed).

Large nematocysts relatively large and ovoid (Fig. 30).

Coppinia fusiform, 22 mm long and 3 mm in diameter, consisting of closely set (Fig. 16C), flask-shaped gonothecae provided with a long distal neck ending in a circular aperture with even rim (Fig. 16C, D). Gonothecal walls coalesced with strong development of the perisarc (Fig. 16D); defensive tubes absent.

REMARKS

Acryptolaria medeae n. sp. is characterized by the gorgonian-like appearance of the stems, much branched in one plane and with many anastomoses which give them a compact aspect, the strong development of perisarc at the abcauline wall of the hydrotheca, and the fairly wide gonothecae. The large nematocysts are abundant.

This new species is close to *A. disordinata* n. sp. in stem structure, being much branched in one plane, and by the presence of a strong perisarc development in the abcauline hydrothecal wall. Nevertheless they distinctly differ in the nematocysts which in *A. disordinata* n. sp. are larger (25.6 × 9.4 µm). Furthermore in the latter the branches strongly widen where the hydrothecae become free, the strong development of perisarc of the abcauline wall reaches the hydrotheca situated below, the cylindrical hydrothecae are larger and,

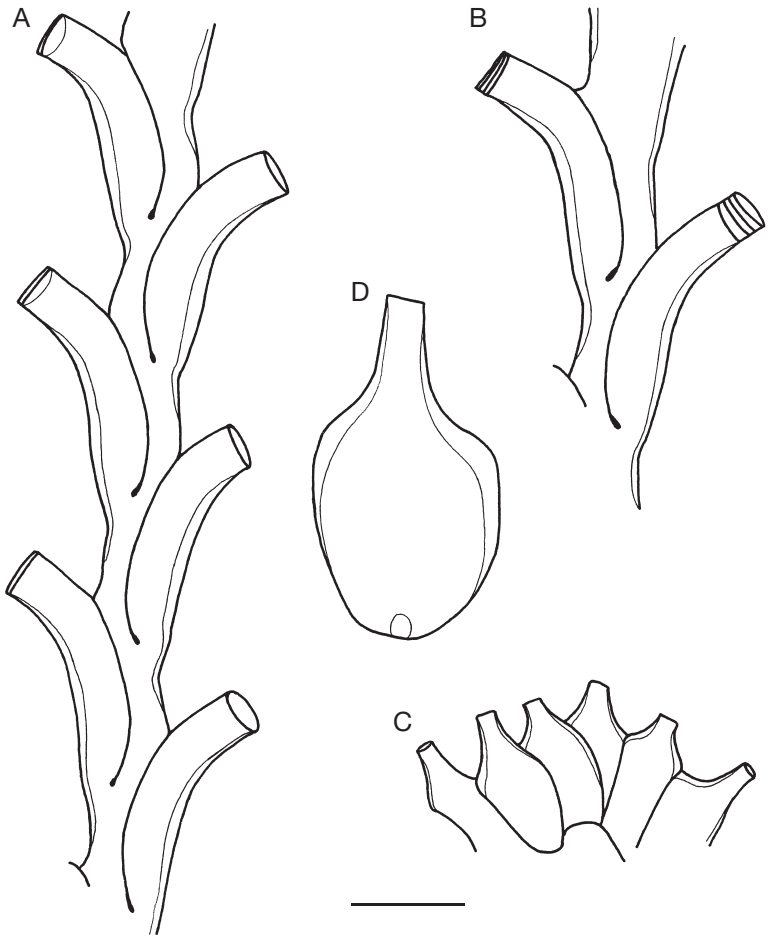

FIG. 16. — *Acryptolaria medeae* n. sp., from MUSORSTOM 4 stn CP 195: **A**, **B**, branch fragments showing hydrothecal arrangement and hydrothecae; **C**, part of coppinia showing gonothecae (lateral view); **D**, gonotheca (lateral view). Scale bar: A-C, 250 µm; D, 125 µm.

finally, the gonothecae are in a chaotic disposition in the coppinia.

Acryptolaria cf. *minima* Totton, 1930
(Figs 17; 30; Table 18)

Acryptolaria minima Totton, 1930: 162, 163, fig. 18a, b. — Ralph 1958: 315, fig. 3e, f. — Peña Cantero *et al.* 2007: 254-256, figs 10, 16B, 18C, 19B, D, tab. X.

MATERIAL EXAMINED. — **Norfolk Ridge.** BIOCAL 1, stn DW 36, 23°08.647'-23°08.900'S, 167°10.994'-167°11.296'E, 650-680 m, 29.VIII.1985, 3 stems up to 14 mm high (RMNH-Coel. no. 31519). — Stn DW 51, 23°05.273'-23°05.432'S, 167°44.951'-167°45.355'E, 700-680 m, 31.VIII.1985, 2 stems up to 17 mm high on sponge (MNHN-Hy.2009-0200).

ECOLOGY AND DISTRIBUTION. — *Acryptolaria minima* was previously only known from New Zealand shelf waters, at depths from 20 m (Totton 1930) to 180 m (Ralph 1958), having been reported from off Cape North and Cape Maria van Diemen (Totton 1930) and from Cook Strait (Ralph 1958). Our material was collected in deeper waters, at depths between 650 and 700 m, in the Norfolk Ridge area; it was epibiotic on sponges.

TABLE 18. — Measurements of *Acryptolaria* cf. *minima* Totton, 1930 (in µm).

	BIOCAL 1 stn DW 36		BIOCAL 1 stn DW 51	
	Range	Mean ± SD (n = 10)	Range	Mean ± SD (n)
Hydrothecae				
Length of abcauline wall	470-550	508.0 ± 25.6	550-600	578.8 ± 23.2 (8)
Length of adcauline wall	650-720	674.0 ± 21.5	715-800	759.4 ± 25.4 (8)
Length of free adcauline wall	150-250	187.0 ± 26.9	170-300	235.6 ± 37.2 (8)
Length of adnate adcauline wall	450-520	487.0 ± 25.3	450-580	523.8 ± 37.3 (8)
Ratio adnate/free adcauline wall	1.9-3.4	2.7 ± 0.5	1.5-3.2	2.3 ± 0.5 (8)
Diameter at aperture	125-140	130.5 ± 4.2	115-130	123.8 ± 5.4 (8)
Nematocysts				
Larger group	24-26 × 9-10	24.9 ± 0.8 × 9.8 ± 0.3	22-24.5 × 9.5-11	22.9 ± 0.8 × 10.3 ± 0.6 (10)
Ratio	2.4-2.9	2.6 ± 0.2	2.1-2.4	2.2 ± 0.1(10)
Smaller group			6 × 3	

DESCRIPTION

Stems up to 17 mm high. Branching frequent (up to third-order branches present), either irregular or alternate in more or less one plane or in several planes. Branches straight (Fig. 17).

Hydrothecae alternately arranged in approximately one plane (Fig. 17), cylindrical, either with a constant diameter throughout, only decreasing at base, or with slightly decreasing diameter along adnate part (Fig. 17). Hydrotheca smoothly curved outwards; adcauline wall adnate to internode over two-thirds of its length (adnate/free ratio 2.3-2.7). Adcauline wall convex throughout; abcauline wall straight basally and concave in distal half. Hydrothecal aperture circular and directed outwards, frequently parallel to long axis of branches. Rim even, often with short renovations.

Large nematocysts relatively large and ovoid (Fig. 30).

Coppinia not found.

REMARKS

Peña Cantero *et al.* (2007) redescribed the holotype of *Acryptolaria minima*. They characterized this species as having its hydrothecae almost completely adnate to the branches (only one-fifth of the adcauline wall is free), by the shape and size of the hydrothecae and by the size of the nematocysts, as it has the smallest hydrothecae and the largest nematocysts (apart from *A. tortugasensis*) amongst the known species of *Acryptolaria*. Our material generally agrees with the type material in size of hydrothecae and nematocysts (cf. Peña Cantero *et al.* 2007: table X) but differs because in the type material the hydrothecae are less strongly directed outwards, have a shorter free portion of the adcauline wall and the basal part of the abcauline wall is slightly convex. Consequently we have some doubts concerning the proper dessignation of our material. Given the diversity shown by the genus in the area under investigation it would not be surprising if our material belonged to a different species, which owing to the paucity of material cannot be characterized at present.

Acryptolaria minuta Watson, 2003
(Figs 18; 30; Table 19)

Acryptolaria minuta Watson, 2003: 163, 164, fig. 13A-C. — Peña Cantero *et al.* 2007: 256-258, figs 11, 16C, tab. XI.

MATERIAL EXAMINED. — **Loyalty Islands.** MUSORSTOM 6, DW 406, 20°40.65'S, 167°06.80'E, 373 m, 15.II.1989, several stems up to 30 mm high, on hydroid stem (MNHN-Hy.2009-0201). — Stn DW 481, 21°21.85'S, 167°50.30'E, 300 m, 23.II.1989, several stems up to 25 mm high, on sponge (RMHH-Coel. no. 31520). **Norfolk Ridge.** BIOCAL 1, stn DW 37, 22°59.990'-23°00.079'S, 167°15.650'-167°16.340'E, 350 m, 30.VIII.1985, three stems up to 27 mm high, on gorgonian axis (MNCN 2.03/425).

ECOLOGY AND DISTRIBUTION. — So far *Acryptolaria minuta* was known only from the Macquarie Island

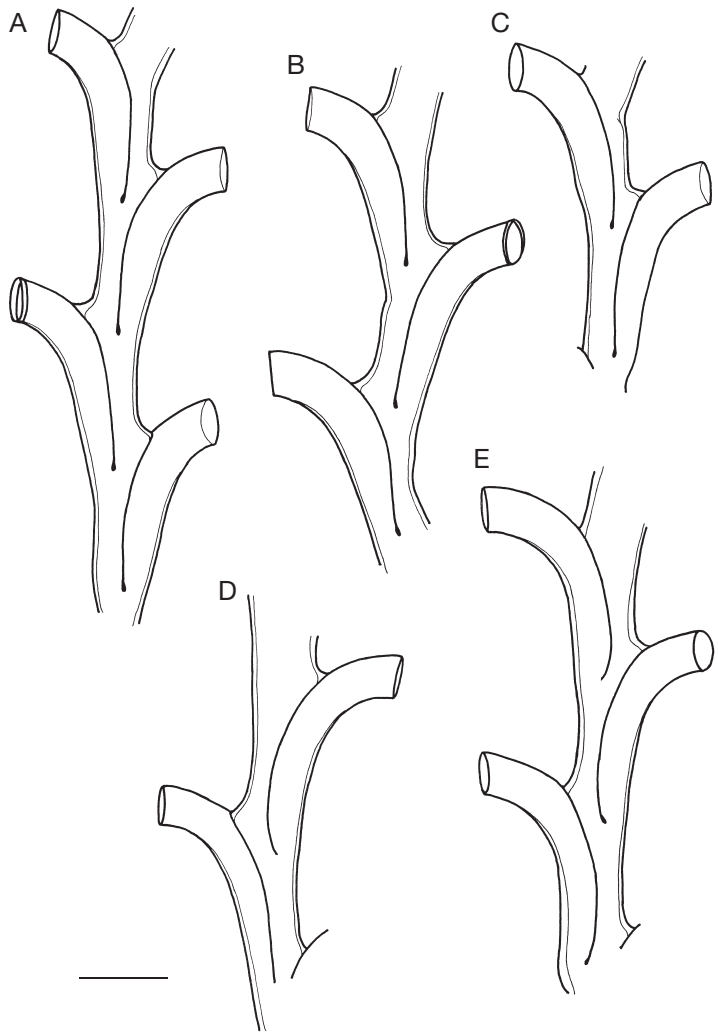

FIG. 17. — *Acryptolaria* cf. *minima* Totton, 1930, branch fragments showing hydrothecal arrangement and hydrothecae: **A**-**C**, from BIOCAL 1 stn DW 36; **D**, **E**, from BIOCAL 1 stn DW 51. Scale bar: 250 µm.

area (52°59.4'-53°02'S, 159°59'-159°58.2'E), where it was collected at a depth of 1422 m on a dead primnoid gorgonian (Watson 2003). Our material was found at depths between 300 and 373 m in the Loyalty Islands and Norfolk Ridge areas where it was found epibiotic on a sponge, the axis of a gorgonian and a hydroid stem.

DESCRIPTION

Stems up to 30 mm high. Branching frequent and irregular, approximately in one plane; anastomoses may be present. Branches straight (Fig. 18A, C, D).

Hydrothecae alternately arranged in one plane (Fig. 18A, C, D), tubular, roughly cylindrincal; diameter decreasing at basal part (Fig. 18). Hydrotheca strongly curved outwards; adcauline wall adnate over approximately two-thirds of its length (adnate/free ratio 2.1), convex. Abcauline wall concave, but basally straight. Hydrothecal aperture circular and directed outwards, almost parallel to long axis of branches; rim even, with few renovations (Fig. 18A).

TABLE 19. — Measurements of *Acryptolaria minuta* Watson, 2003 (in µm). Hydrothecae from BIOCAL 1 stn DW 37; nematocysts from MUSORSTOM 6 stn DW 481.

	Range	Mean ± SD (n)
Hydrothecae		
Length of abcauline wall	550-600	568.6 ± 20.3 (7)
Length of adcauline wall	710-800	762.1 ± 25.9 (7)
Length of free adcauline wall	225-280	247.9 ± 18.9 (7)
Length of adnate adcauline wall	480-550	514.3 ± 28.2 (7)
Ratio adnate/free adcauline wall	1.7-2.4	2.1 ± 0.2 (7)
Diameter at aperture	115-140	129.3 ± 6.8 (7)
Nematocysts		
Larger group	17-19 × 7-8	18.5 ± 0.6 × 7.5 ± 0.4 (10)
Ratio	2.3-2.6	2.5 ± 0.1 (10)
Smaller group	6-7 × 3	

Large nematocysts relatively small and ovoid (Fig. 30).

Coppinia not observed.

REMARKS

Peña Cantero *et al.* (2007) redescribed the holotype of *Acryptolaria minuta* composed of scarce material mounted on a slide. As indicated by those authors, *Acryptolaria minuta* is similar to *A. minima* in the size of the hydrothecae, though in the former the hydrothecae are larger and thinner, strongly curved outwards and with a much larger portion of the adcauline wall free. Moreover, the nematocysts are much smaller (25.8 × 9.8 µm in the type material of *A. minima*). Our material roughly agrees with Watson's species. The slight difference in the size of the nematocysts (16.7 × 6.3 µm in the type material) is considered to be less important as Peña Cantero *et al.* (2007) measured the nematocysts of the holotype of *A. minuta* in a mounted slide.

Acryptolaria niobae n. sp.
(Figs 19; 30; 32C; Table 20)

TYPE MATERIAL. — **Loyalty Islands.** BIOCAL 1, stn DW 08, 20°34.351'-20°35.092'S, 166°53.904'-166°54.051'E, 435 m, 12.VIII.1985, 1 stem *c.* 23 mm high, holotype (MNHN-Hy.2009-0167).
Norfolk Ridge. CHALCAL 2, stn DW 76, 23°40.50'S-167°45.20'E, 470 m, 30.X.1986, 1 stem 25 mm high, paratype (MNHN-Hy.2009-0156, slide); 1 stem 35 mm high, paratype (RMNH-Coel. no. 35020, slides 448).

OTHER MATERIAL EXAMINED. — **Loyalty Islands.** BIOGEOCAL, stn CP 290, 20°36.01'-20°37.26'S, 167°03.34'-167°03.60'E, 920-760 m, 27.IV.1987, 1 basally broken, unbranched stem *c.* 15 mm high (MNHN-Hy.2009-0155, slide).
Norfolk Ridge. BIOCAL 1, stn DW 66, 24°55.435'-24°54.849'S, 168°21.678'-168°21.995'E, 515-505 m, 3.IX.1985, 1 stem *c.* 16 mm high in slide (MNCN 2.03/398).

ETYMOLOGY. — The specific name *niobae* is a dedication to Níobe Peña Sancho, daughter of the first author. It is a noun in female genitive.

ECOLOGY AND DISTRIBUTION. — *Acryptolaria niobae* n. sp. originates from the Loyalty Islands and the Norfolk Ridge areas where it was collected at depths between 435 and 920 m.

DESCRIPTION

Stems up to 23 mm high, very scarcely branched (Fig. 32C); the largest stem with just a primary branch giving rise to a secondary one. Branches with an inconspicuous zigzag arrangement (Fig. 19A).

Hydrothecae alternately arranged in approximately one plane (Fig. 19A), tubular (Fig. 19), cylindrical in distal fourth, diameter slightly decreasing basally and reaching minimum diameter a little above the point where the hydrotheca becomes adnate. At that point the hydrotheca widens slightly and contributes to the formation of an expanded part of the branch (Fig. 19C); the diameter at adnate part remains roughly uniform (Fig. 19). Free part of hydrotheca basically straight, strongly directed outwards due to sharp inflection

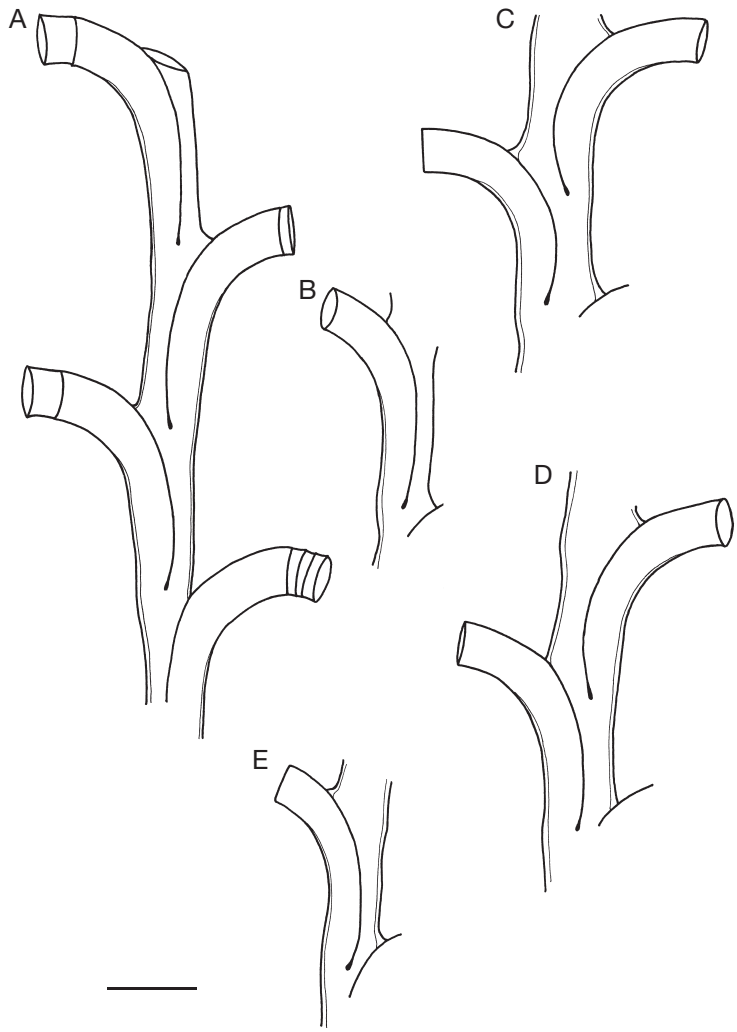

FIG. 18. — *Acryptolaria minuta* Watson, 2003, branch fragments showing hydrothecal arrangement and hydrothecae: **A**, **B**, from MUSORSTOM 6 stn DW 481; **C**, **D**, from BIOCAL 1 stn DW 37; **E**, from MUSORSTOM 6 stn DW 406. Scale bar: 250 µm.

at the point where the hydrotheca becomes free. Hydrotheca adnate for approximately one-fifth of its adcauline wall (adnate/free ratio 0.2); that wall straight at adnate part and straight or slightly convex at its free portion; abcauline wall slightly concave, straight at distal part. Hydrothecal aperture circular, oblique and directed upwards, forming an angle of *c.* 45° with long axis of internode. Rim even, frequently with a few short renovations (Fig. 19A).

Large nematocysts relatively large and banana-shaped (Fig. 30).

Coppinia not found.

REMARKS

Acryptolaria niobae n. sp. is a very peculiar species. It resembles *A. infinita* n. sp. in the long hydrothecae and in the colony structure, having only few ramifications and branches with a slight zigzag disposition. Nevertheless, they are distinguishable by several

TABLE 20. — Measurements of *Acryptolaria niobae* n. sp. from the holotype (in µm). Hydrothecae also from BIOCAL 1 stn DW 66.

	Range	Mean ± SD (n)
Hydrothecae		
Length of abcauline wall	1600-1730	1684.0 ± 46.7 (5)
Length of adcauline wall	1750-1870	1812.0 ± 47.5 (5)
Length of free adcauline wall	1480-1600	1522.0 ± 41.2 (5)
Length of adnate adcauline wall	250-370	290.0 ± 43.4 (5)
Ratio adnate/free adcauline wall	0.2-0.3	0.19 ± 0.03 (5)
Diameter at aperture	210-240	221.0 ± 11.1 (5)
Nematocysts		
Larger group	22-24 × 6-6.5	22.8 ± 0.6 × 6.1 ± 0.2 (10)
Ratio	3.5-3.8	3.7 ± 0.1 (10)
Smaller group	7 × 2.5	

features. First of all the hydrotheca in *A. infinita* n. sp. is smoothly curved outwards, lacking the characteristic widening at the point where hydrotheca and branch meet observed in *A. niobae* n. sp. Moreover, in *A. infinita* n. sp. the hydrotheca is approximately cylindrical at the free portion and much larger. They also differ in the size of the nematocysts, which are much smaller in *A. infinita* n. sp. (14.8 × 8.1 µm), and in the extremely small adnate portion of the hydrotheca in *A. niobae* n. sp.

Acryptolaria norfolkensis n. sp.
(Figs 20; 30; 32D; Table 21)

TYPE MATERIAL. — **Norfolk Ridge.** BIOCAL 1, stn DW 36, 23°08.647'-23°08.900'S, 167°10.994'-167°11.296'E, 650-680 m, 29.VIII.1985, 5 stems up to 80 mm high and 2 unbranched incipient stems up to 8 mm high, on hard substratum; plus a *c.* 5 mm long fragment. Of this lot 1 70 mm high stem with 2 incipient stems on rock fragment, holotype (MNHN-Hy.2009-0168); 1 30 mm long stem with side branch, paratype (RMNH-Coel. no. 31521).

OTHER MATERIAL EXAMINED. — **Norfolk Ridge.** CHALCAL 2, stn DW 81, 23°19.60'S, 168°03.40'E, 320-340 m, 31.X.1986, 1 basally broken stem *c.* 17 mm high in slide (MNCN 2.03/399).
MUSORSTOM 4, stn DW 220, 22°58.5'S, 167°38.3'E, 505-550 m, 29.IX.1985, 1 stem *c.* 27 mm high (RMNH-Coel. no. 35040, slide 491).

ETYMOLOGY. — The specific name *norfolkensis* refers to the Norfolk Ridge, the area where this species was collected. It is an adjective in genitive singular.

ECOLOGY AND DISTRIBUTION. — *Acryptolaria norfolkensis* n. sp. was collected at depths between 320 and 680 m in the Norfolk Ridge area.

DESCRIPTION

Stems up to 80 mm high, robust and strongly polysiphonic. Branching frequent (up to fourth-order branches observed) and irregular, yet more or less in one plane (Fig. 32D). In general, primary branches well developed, giving rise to lower-order branches; occasional anastomoses are present. Branches straight (Fig. 20A), but distinctly widening at point where the hydrotheca becomes free (Fig. 20).

Hydrothecae alternately arranged in approximately one plane (Fig. 20A-C), more or less cylindrical (Fig. 20), but with a clear decrease of diameter at their basal third; minimum diameter at the base. Distal part of hydrotheca roughly straight; strongly directed outwards. Adcauline wall adnate for almost two-thirds of its length (adnate/free ratio 1.8), either convex throughout or straight at free portion; abcauline wall slightly concave, straight at distal part, with strong perisarc development reaching as far downwards as hydrotheca underneath. Hydrothecal aperture circular, obliquely directed upwards, forming an angle of 20-50° with long axis of branch. Rim even, frequently with a few short renovations.

Large nematocysts relatively large and fusiform (Fig. 30).

Coppinia not observed.

REMARKS

Acryptolaria norfolkensis n. sp. is close to *A. disordinata* n. sp. in general appearance of the stems

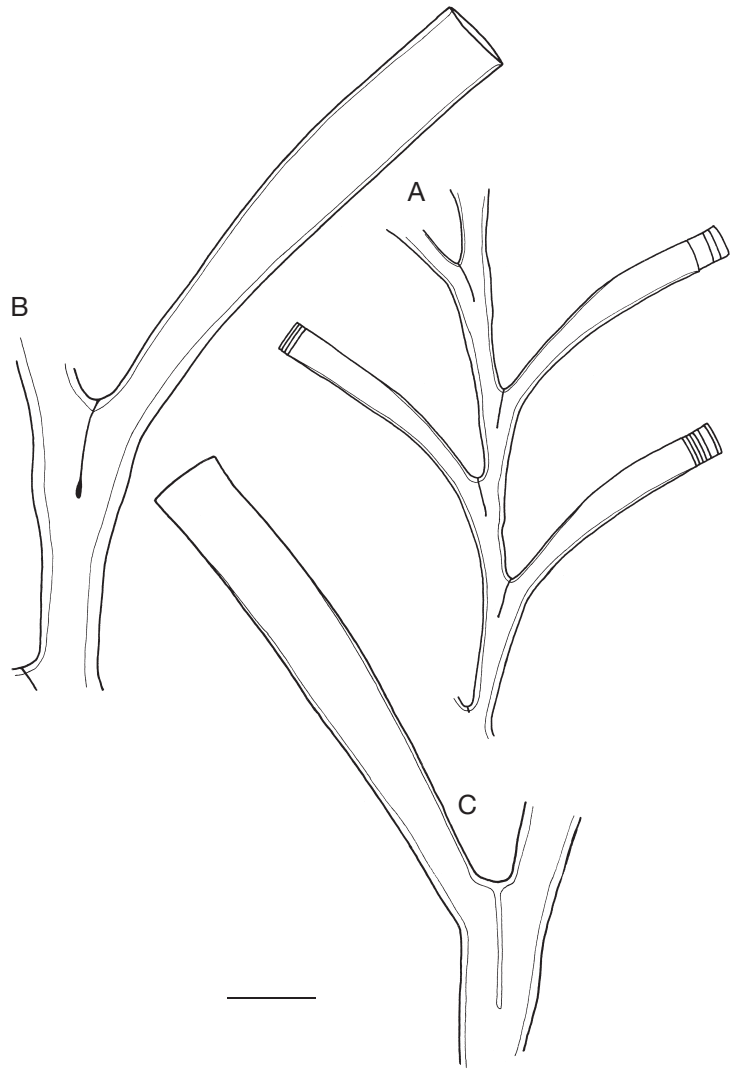

FIG. 19. — *Acryptolaria niobae* n. sp.: **A**, branch fragment showing hydrothecal arrangement; **B**, **C**, hydrothecae; **A**, **B**, from BIOCAL 1 stn DW 66; **C**, from BIOCAL 1 stn DW 08. Scale bar: A, 600 µm; B, C, 250 µm.

that frequently branch in one plane, in the straight branches that widen markedly at the point where the hydrotheca becomes free, in the hydrothecae being directed outwards from their base, and in the size of the nematocysts. However, they differ distinctly in the shape and size of the hydrothecae, *A. norfolkensis* n. sp. being a much more robust species with larger hydrothecae, in particular their diameter. The two species also differ in the larger free portion of the adcauline hydrothecal wall and in the distinct decrease in hydrothecal diameter over its basal third in *A. norfolkensis* n. sp.

In the general shape and size of the hydrothecae, *Acrypolaria norfolkensis* n. sp. also reminds *A. bathyalis* n. sp. However, they are clearly distinguishable because the latter is a less robust species, with branches not widening at the point where the hydrotheca becomes free, with a much shorter free

TABLE 21. — Measurements of *Acryptolaria norfolkensis* n. sp. from the holotype (in µm).

	Range	Mean ± SD (n)
Hydrothecae		
Length of abcauline wall	740-870	800.0 ± 35.2 (10)
Length of adcauline wall	920-1050	995.0 ± 38.8 (10)
Length of free adcauline wall	300-410	362.0 ± 35.7 (10)
Length of adnate adcauline wall	550-700	633.0 ± 44.7 (10)
Ratio adnate/free adcauline wall	1.4-2.3	1.8 ± 0.3 (10)
Diameter at aperture	180-215	198.0 ± 11.0 (10)
Nematocysts		
Larger group	22-27.5 × 8.5-10	24.8 ± 1.5 × 9.3 ± 0.5 (11)
Ratio	2.3-3.1	2.7 ± 0.2 (11)
Smaller group	7 × 3	

TABLE 22. — Measurements of *Acryptolaria novaecaledoniae* n. sp. from the holotype (in µm). Whole range from several stations.

	Range	Mean ± SD (n)	Whole range (n = 16)
Hydrothecae			
Length of abcauline wall	980-1120	1048.8 ± 63.6 (8)	900-1150
Length of adcauline wall	1230-1430	1336.3 ± 70.5 (8)	1230-1440
Length of free adcauline wall	500-700	616.3 ± 80.5 (8)	500-700
Length of adnate adcauline wall	600-800	720.0 ± 67.0 (8)	600-870
Ratio adnate/free adcauline wall	0.9-1.6	1.2 ± 0.2 (8)	0.9-1.6
Diameter at aperture	210-230	220.0 ± 5.3 (8)	210-250
Nematocysts			
Larger group	17-19 × 4.5-5	17.7 ± 0.7 × 4.7 ± 0.3 (10)	
Ratio	3.5-4.2	3.8 ± 0.2 (10)	
Smaller group	6.5-7 × 3		

adcauline hydrothecal portion, with a distinctly smaller hydrothecal diameter, with the hydrothecae directed outwards only distally and with smaller nematocysts.

Acryptolaria novaecaledoniae n. sp.
(Figs 21; 30; 32E; Table 22)

TYPE MATERIAL. — **Loyalty Islands.** MUSORSTOM 6, stn DW 422, 20°26.20'S, 166°40.31'E, 257 m, 16.II.1989, many stems up to 55 mm high, on coral. Of this lot 1 48 mm high colony, holotype (MNHN-Hy.2009-0169); 1 50 mm high stem, paratype (MNCN 2.03/426); the remaining colony and fragments, paratype (RMNH-Coel. no. 31522).

OTHER MATERIAL EXAMINED. — **Loyalty Islands.** MUSORSTOM 6, stn DW 398, 20°47.19'S, 167°05.65'E, 370 m, 13.II.1989, a few stem fragments up to 60 mm long (MNHN-Hy.2009-0204).

Norfolk Ridge. CHALCAL 2, stn DW 78, 23°41.30'S, 167°59.60'E, 233-360 m, 30.X.1986, 2 stems up to 35 mm high, on coral (MNCN 2.03/427).
SMIB 4, stn DW 51, 23°41.3'-23°40.5'S, 168°00.6'-168°00.7'E, 245-260 m, 9.III.1989, 2 fragments up to 25 mm long (MNHN-Hy.2009-0202). — Stn DW 53, 23°40.1'-23°39.5'S, 167°59.9'-168°00.3'E, 250-270 m, 9.III.1989, 2 stems and 2 fragments up to 47 mm high (MNHN-Hy.2009-0203).
SMIB 5, stn DW 70, 23°40.6'S, 168°01.1'E, 270 m, 7.IX.1989, 3 stems up to 24 mm high (MNCN 2.03/428). — Stn DW 71, 23°41.3'S, 168°00.7'E, 265 m, 7.IX.1989, 1 stem *c.* 17 mm high (MNHN-Hy.2009-0205). — Stn DW 76, 23°41.2'S, 168°00.5'E, 280 m, 7.IX.1989, a few fragments up to 28 mm long (MNHN-Hy.2009-0206); a stem *c.* 15 mm high in slide (MNCN 2.03/400). — Stn DW 78, 23°40.8'S, 168°00.2'E, 245 m, 7.IX.1989, 3 fragments up to 7 mm long (MNCN 2.03/429). — Stn DW 101, 23°21.2'S, 168°04.9'E, 270 m, 14.IX.1989, 2 stems up to 30 mm high (MNCN 2.03/430).

ETYMOLOGY. — The specific name *novaecaledoniae* refers to the New Caledonia region where it was found. The

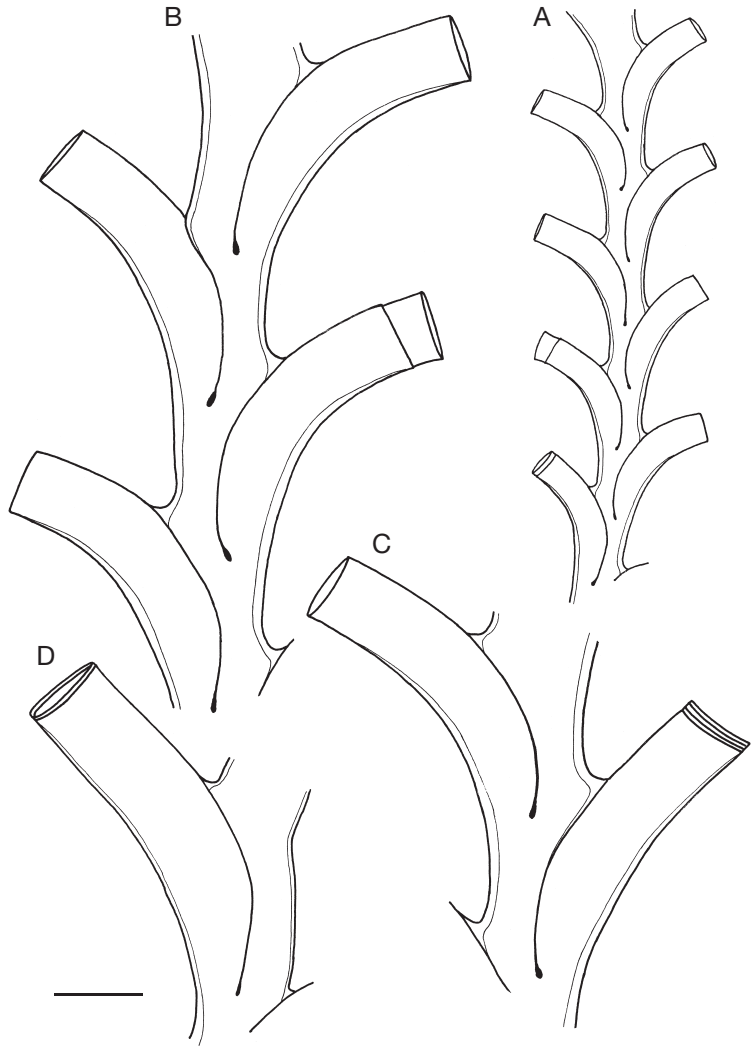

FIG. 20. — *Acryptolaria norfolkensis* n. sp.: **A**, branch fragment showing hydrothecal arrangement; **B**-**D**, hydrothecae; **A**-**C**, from BIOCAL 1 stn DW 36; **D**, from CHALCAL 2 stn DW 81. Scale bar: A, 600 µm; B-D, 250 µm.

species name is a noun in female genitive.

ECOLOGY AND DISTRIBUTION. — *Acryptolaria novaecaledoniae* n. sp. was taken in the Norfolk Ridge area and near the Loyalty Islands, where it was collected at depths between 233 and 370 m. It occurred epibiotic on corals.

DESCRIPTION

Stems up to 60 mm high, strongly polysiphonic. Branching frequent (up to fourth-order branches observed) and irregular, but more or less in one plane (Fig. 32E), sometimes with anastomoses; branches straight (Fig. 21A).

Hydrothecae alternately arranged, approximately in one plane (Fig. 21A), mostly cylindrical (Fig. 21); diameter only decreasing at their base. Hydrotheca strongly curved outwards, free part initially more or less perpendicular to adnate basal part, but eventually slightly turned upwards. As a consequence, the adcauline hydrothecal wall is convex in its adnate basal part and moderately concave in its free portion.

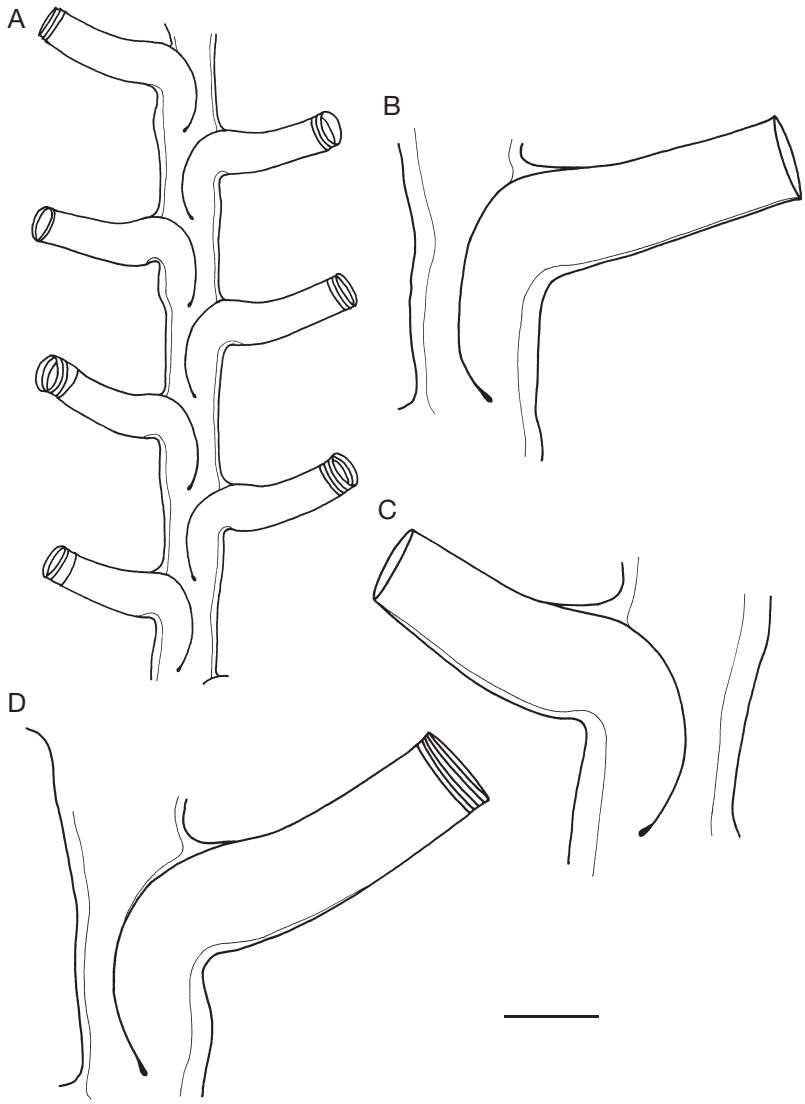

FIG. 21. — *Acryptolaria novaecaledoniae* n. sp.: **A**, branch fragment showing hydrothecal arrangement; **B**-**D**, hydrothecae; **A**, from MUSORSTOM 6 stn DW 422; **B**, from SMIB 5 stn DW 71; **C**, from SMIB 5 stn DW 101; **D**, from MUSORSTOM 6 stn DW 398. Scale bar: A, 600 µm; B-D, 250 µm.

Abcauline wall straight or slightly convex over basal third, followed by a strongly marked inflection point (sometimes forming a shallow embayment), to run straight or convex over its remaining length. Hydrotheca adnate for slightly over half of its adcauline length (adnate/free ratio 1.2); aperture circular, oblique, upwardly directed. Rim even, frequently with several short renovations (Fig. 21A, D).

Large nematocysts relatively small and banana-shaped (Fig. 30).

Coppinia not observed.

REMARKS

Acryptolaria novaecaledoniae n. sp. is certainly close to *A. inversa* n. sp.; the nematocysts in both species are of the same size. Nevertheless, they are distinguish-

able by the degree of branching, that is scarce in *A. inversa* n. sp. and frequent in *A. novaecaledoniae* n. sp., but especially by the shape of the hydrothecae which in *A. novaecaledoniae* n. sp. are never directed downwards and are deprived of the peculiar abcauline hump so characteristic of *A. inversa* n. sp. Moreover, *A. inversa* n. sp. has longer hydrothecae with a much longer free proportion.

Acryptolaria cf. ***operculata*** Stepanjants, 1979
(Figs 22; 30; Table 23)

Acryptolaria operculata Stepanjants, 1979: 52, pl. 9 fig. 5A, B. — Peña Cantero *et al.* 2007: 258-261, figs 12, 16D, 18D, 19E, tab. XII.

Acryptolaria patagonica El Beshbeeshy, 1991: 67-70, fig. 14.

?*Acryptolaria patagonica* – Watson 2003: 162, 163, fig. 12A-C. — Vervoort & Watson 2003: 51-53, fig. 7A-G.

MATERIAL EXAMINED. — **Norfolk Ridge.** BIOCAL 1, stn DW 70, 23°24.700'-23°25.650'S, 167°53.650'-167°52.700'E, 965 m, 4.IX.1985, 1 stem *c.* 8 mm high and a few stolonal hydrothecae on coral (MNHN-Hy.2009-0207).
CHALCAL 2, stn DW 76, 23°40.50'S, 167°45.20'E, 470 m, 30.X.1986, 1 stem *c.* 14 mm high (RMNH-Coel. no. 31523).

ECOLOGY AND DISTRIBUTION. — *Acryptolaria operculata* has been collected from depths between 98 and 980 m (El Beshbeeshy 1991). Its confirmed known distribution includes sub-Antarctic waters of the Patagonian shelf (Stepanjants 1979; El Beshbeeshy 1991). Our material originates from the Norfolk Ridge area where it was collected at depths between 470 and 965 m, living epibiotic on corals.

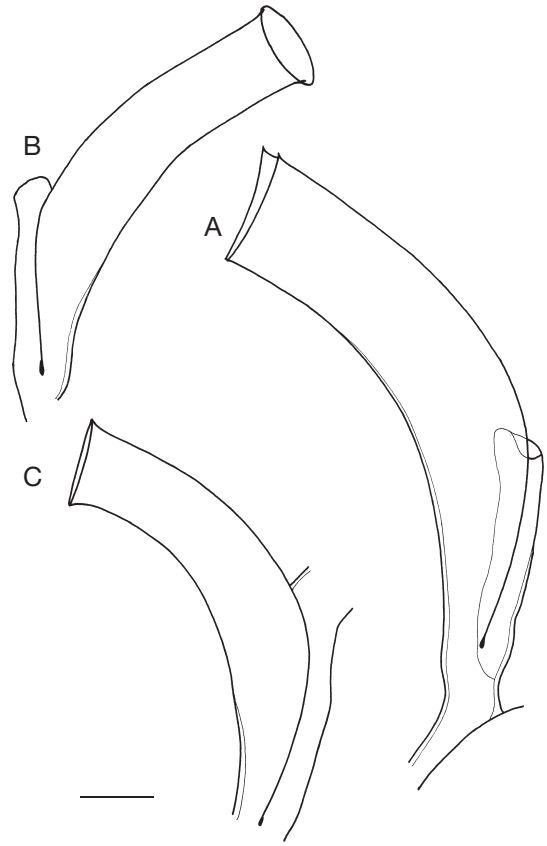

FIG. 22. — *Acryptolaria* cf. *operculata* Stepanjants, 1979, hydrothecae: **A**, from BIOCAL 1 stn DW 70; **B**, **C**, from CHALCAL 2 stn DW 76. Scale bar: 250 µm.

DESCRIPTION
Stems up to 14 mm high, unbranched. Hydrothecae tubular, roughly cylindrical at free part (Fig. 22), diameter decreasing basally at adnate portion; minimum diameter at base. Hydrotheca strongly and regularly curved outwards (Fig. 22), adnate in one-third of its adcauline length (adnate/free ratio 0.6). Adcauline wall convex; abcauline wall concave. Hydrothecal aperture circular, directed upwards, forming an angle of 30° with long axis of branch. Rim even, with few short renovations.

Large nematocysts relatively small and fusiform (Fig. 30).

Coppinia not found.

REMARKS
See Peña Cantero *et al.* (2007) for an extensive discussion of this species, mentioning also the presence of a one-flap operculum in the hydrothecae. These authors characterized the species by the size and arrangement of the hydrothecae. Although there are other species of a similar size (e.g., *A. infinita* n. sp.) and with hydrothecae arranged in two planes making an obtuse angle (e.g., *A. tortugasensis*), the combination of these characters with others such as the shape of the hydrothecae and the

TABLE 23. — Measurements of *Acryptolaria* cf. *operculata* Stepanjants, 1979 (in µm).

	Range CHALCAL 2 stn DW 76	Range BIOCAL 1 stn DW 70
Hydrothecae		
Length of abcauline wall	1350	1450
Length of adcauline wall	1750	1850
Length of free adcauline wall	900	1300
Length of adnate adcauline wall	850	750
Ratio adnate/free adcauline wall	0.9	0.6
Diameter at aperture	310	400
Nematocysts		
Larger group	14-16 × 4-5 (4)	14 × 4.5 (1)
Ratio	2.8-3.6	3.1
Smaller group	7 × 3	7 × 2.5

TABLE 24. — Measurements of *Acryptolaria profunda* n. sp. from the holotype (in µm).

	Range	Mean ± SD (n = 10)
Hydrothecae		
Length of abcauline wall	1850-2100	1990 ± 71.3
Length of adcauline wall	2100-2330	2212 ± 80.8
Length of free adcauline wall	1100-1500	1244 ± 135.7
Length of adnate adcauline wall	760-1110	968 ± 105.3
Ratio adnate/free adcauline wall	0.5-1.0	0.8 ± 0.2
Diameter at aperture	260-300	278 ± 12.5
Nematocysts		
Larger group	18-20 × 8-9	19.1 ± 0.6 × 8.6 ± 0.5
Ratio	2.1-2.4	2.2 ± 0.1
Smaller group	7-7.5 × 3.5-4	

size of the nematocysts, makes this species easily identifiable.

Peña Cantero *et al.* (2007) included into this species the material assigned to *Acryptolaria patagonica* by Watson (2003) and Vervoort & Watson (2003) on morphological and dimensional grounds, since no information concerning the cnidome was provided by those authors. However, in the light of the diversity shown by the genus, we consider wiser to regard those records as doubtful, waiting for the study of the cnidome.

Concerning our present material, we have doubts about its conspecificity with *Acryptolaria operculata*. The material from BIOCAL 1 stn DW 70 is so scarce that it is not possible to compare branching pattern or hydrothecal arrangement. Moreover, it is practically deprived of coenosarc and only a single nematocyst could be found. It differs from the material studied so far in having much shorter hydrothecae with a relatively much longer free portion, though it agrees in the general shape of the hydrothecae and the size of the nematocyst. On the other hand, the material from CHALCAL 2 stn DW 76, a single *c.* 14 mm high stem, with hydrothecae arranged in two planes making an obtuse angle, agrees with previously studied material in the general shape of the hydrothecae and the size of the nematocysts, but differs in having much smaller hydrothecae and a flared hydrothecal rim.

Acryptolaria profunda n. sp.
(Figs 23; 30; 32F; Table 24)

TYPE MATERIAL. — **Loyalty Islands.** MUSORSTOM 6, stn DW 422, 20°26.20'S-166°40.31'E, 257 m, 16.II.1989, 1 stem *c.* 20 mm high, holotype (MNHN-Hy.2009-0170).

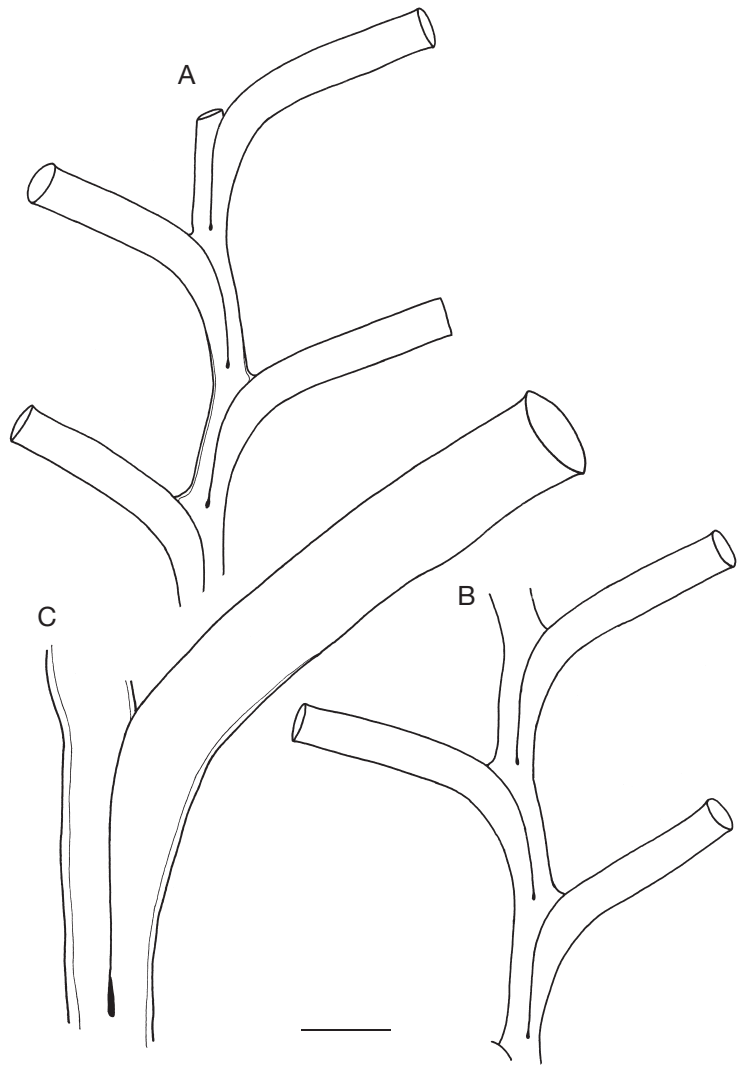

FIG. 23. — *Acryptolaria profunda* n. sp., from MUSORSTOM stn DW 422: **A**, **B**, branch fragment showing hydrothecal arrangement; **C**, hydrotheca. Scale bar: A, B, 600 µm; C, 250 µm.

ETYMOLOGY. — The specific name *profunda* refers to deep hydrothecae, the Latin "profundum" meaning deep. It is an adjective in feminine gender.

ECOLOGY AND DISTRIBUTION. — *Acryptolaria profunda* n. sp. was collected at a depth of 257 m in the Loyalty Islands.

DESCRIPTION

Stem basally truncate, 20 mm high (Fig. 32F), with only two short, alternate primary branches with a slight zigzag structure (Fig. 23A, B), obscure at the strongly polysiphonic basal part where the stem seems to be straight. Branches slightly widening at the point where the hydrotheca becomes free (Fig. 23A, B).

Hydrothecae alternately arranged in one plane (Fig. 23A, B), tubular, roughly cylindrical in the free portion (Fig. 23); diameter decreasing at basal adnate part, minimum diameter at base.

Hydrotheca strongly curved outwards, but distal part basically straight. Hydrotheca free over half of its adcauline length (adnate/free ratio 0.8). Adcauline wall convex at basal half, straight at distal half; proximal part of abcauline wall concave, but straight at distal half. Hydrothecal aperture circular, oblique and directed upwards, forming an angle of *c.* 30° with the long axis of branches. Some hydrothecae without renovations, but others with up to nine.

Large nematocysts relatively large and fusiform (Fig. 30).

Coppinia not observed.

REMARKS

Acryptolaria profunda n. sp. has certain characters in common with *A. laertesi* n. sp. as for instance the general shape of the hydrothecae, though these are smaller in the latter and a larger proportion of the adcauline hydrothecal wall is adnate. Both species are also distinguishable by the size of the nematocysts, that are much larger in *A. laertesi* n. sp. (29.5 × 7.2 µm).

Acryptolaria pseudoangulata n. sp.
(Figs 24; 30; 32G; Table 25)

TYPE MATERIAL. — **NW New Caledonia.** MUSORSTOM 4, stn CP 217, 23°03.6'S, 167°27.0'E, 850 m, 29.IX.1985, many stems up to 30 mm high, with coppinia (5 *c.* 25 mm high stems with coppinia from communal stolonal mass, holotype, MNHN-Hy.2009-0171; several stems on gorgonid, paratype, RMNH-Coel. no. 31524; several stems on gorgonid, paratype, MNCN 2.03/431).

OTHER MATERIAL EXAMINED. — **NW New Caledonia.** MUSORSTOM 4, stn CP 180, 18°56.8'S, 163°17.7'E, 450 m, 18.IX.1985, 1 fragment *c.* 12 mm long (MNHN-Hy.2009-0213). — Stn CP 194, 18°52.8'S, 163°21.7'E, 550 m, 19.IX.1985, many stems up to 40 mm high, on sponge (RMNH-Coel. no. 31525).
Loyalty Islands. BIOGEOCAL, stn CP 297, 20°38.64'-20°38.67'S, 167°10.77'-167°11.07'E, 1230-1240 m, 28.IV.1987, 6 stems up to 100 mm high, on coral (MNHN-Hy.2009-0208). — Stn DW 307, 20°35.38'-20°35.32'S, 166°55.25'-166°55.33'E, 470-480 m, 1.V.1987, 1 fragment *c.* 11 mm long (MNHN-Hy.2009-0209).
Norfolk Ridge. BIOCAL 1, stn DW 36, 23°08.647'-23°08.900'S, 167°10.994'-167°11.296'E, 650-680 m, 29.VIII.1985, 6 stems up to 25 mm high, on coral (MNCN 2.03/432). — Stn DW 66, 24°55.435'-24°54.849'S, 168°21.678'-168°21.995'E, 515-505 m, 3.IX.1985, a few stems up to 23 mm high, on coral (MNHN-Hy.2009-0210). — Stn DW 70, 23°24.700'-23°25.650'S, 167°53.650'-167°52.700'E, 965 m, 4.IX.1985, 1 stem *c.* 29 mm high (MNCN 2.03/433). SMIB 4, stn DW 36, 24°55.6'-24°54.9'S, 168°21.7'-168°21.7'E, 500-530 m, 7.III.1989, 1 fragment *c.* 13 mm long and 2 stems up to 24 mm (MNHN-Hy.2009-0211). — Stn DW 37, 24°54.5'-24°53.9'S, 168°22.3'-168°21.5'E, 515-540 m, 7.III.1989, 4 stems up to 21 mm high, on coral (MNCN 2.03/434). — Stn DW 39, 24°56.2'-24°55.4'S, 168°21.5'-168°21.5'E, 525-560 m, 7.III.1989, 5 stems up to 25 mm high (RMNH-Coel. no. 31526).
Chesterfield Islands. MUSORSTOM 5, stn CP 293, 23°09.35'S, 159°30.80'E, 280 m, 11.X.1986, 1 stem *c.* 12 mm high (RMNH-Coel. no. 35441, slide 1687).

ETYMOLOGY. — The specific name *pseudoangulata* refers to the fact that in this species the shape of the hydrothecae reminds that of *A. angulata*; the species name is an adjective corresponding in gender with the (feminine) genus name.

ECOLOGY AND DISTRIBUTION. — *Acryptolaria pseudoangulata* n. sp. seems to be a bathyal species, having been collected at depths between 280 and 1240 m. It was found at the Chesterfield Islands, at the Loyalty Islands, in the Norfolk Rigde area and off NW New Caledonia. It lives epibiotic on coral and sponges. Coppinia was found in September.

DESCRIPTION

Stems up to 100 mm high, but usually much smaller (Fig. 32G). Branching irregular but approximately in one plane. Degree of branching variable, from scarcely branched stems with just a few primary branches to abundantly branched stems with up to third-order branches. Branches slightly geniculate (Fig. 24A), sometimes with anastomoses.

Hydrothecae approximately in one plane (Fig. 24A, B) and with a double curvature (Fig. 24A-D): strongly curved outwards where they become free, being roughly perpendicular to adnate portion, and then curving markedly upwards; some of the longer hydrothecae may present a third slight outward bend (Fig. 24D). Hydrothecal diameter increasing distally in free part; maximum diameter at aperture, minimal

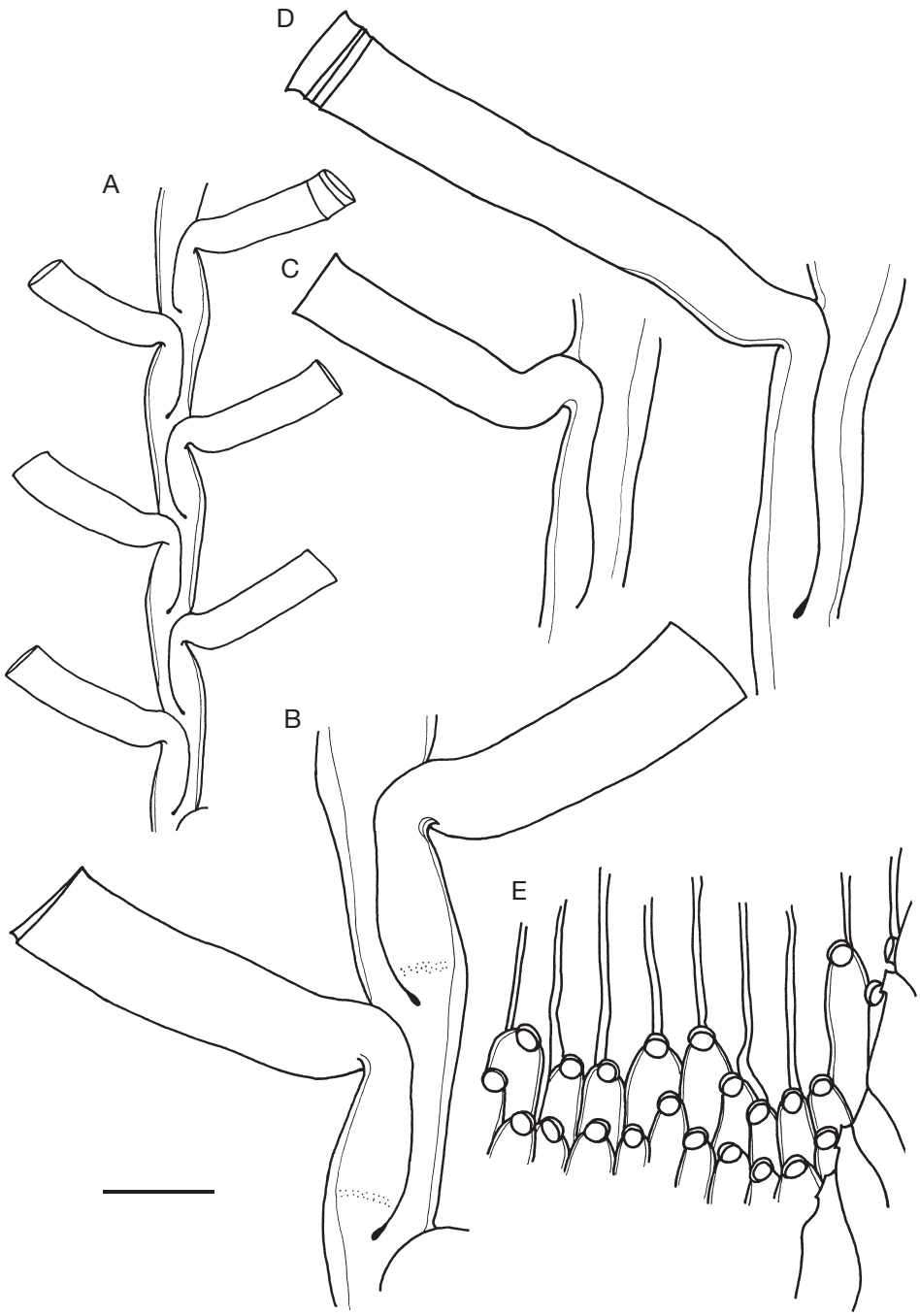

FIG. 24. — *Acryptolaria pseudoangulata* n. sp.: **A**, branch fragment showing hydrothecal arrangement; **B**-**D**, hydrothecae; **E**, part of coppinia showing gonothecae and fence of protective tubes; **A**, **B**, **E**, from MUSORSTOM 4 stn CP 217; **C**, from BIOGEOCAL stn DW 307; **D**, from BIOCAL 1 stn DW 70. Scale bar: A, 600 µm; B-E, 250 µm.

TABLE 25. — Measurements of *Acryptolaria pseudoangulata* n. sp. from the holotype (in µm). Nematocysts from several stations.

	Range	Mean ± SD (n)
Hydrothecae		
Length of abcauline wall	1100-1450	1291.1 ± 90.7 (9)
Length of adcauline wall	1200-1460	1355.6 ± 72.3 (9)
Length of free adcauline wall	640-780	714.4 ± 48.6 (9)
Length of adnate adcauline wall	560-680	641.1 ± 36.3 (9)
Ratio adnate/free adcauline wall	0.8-1.0	0.9 ± 0.1 (9)
Diameter at aperture	220-240	230.6 ± 10.1 (9)
Gonothecae		
Maximum diameter	*c.* 100	
Length of funnel	*c.* 20	
Diameter at aperture	60-70	
Nematocysts		
Larger group	9-12 × 3-5	10.7 ± 1.0 × 4.0 ± 0.8 (11)
Ratio	2.0-4.0	2.8 ± 0.6 (11)
Smaller group	6-8.5 × 2-3	

TABLE 26. — Measurements of *Acryptolaria pseudoundulata* n. sp. from the holotype (in µm).

	Range	Mean ± SD (n)
Hydrothecae		
Length of abcauline wall	1250-1350	1311.1 ± 31.0 (9)
Length of adcauline wall	1500-1650	1571.1 ± 44.3 (9)
Length of free adcauline wall	670-800	762.2 ± 46.0 (9)
Length of adnate adcauline wall	750-860	808.9 ± 34.1 (9)
Ratio adnate/free adcauline wall	0.9-1.2	1.1 ± 0.1 (9)
Diameter at aperture	250-300	268.9 ± 16.9 (9)
Nematocysts		
Larger group	26-28 × 10-12	27.2 ± 1.0 × 10.7 ± 1.2 (3)
Ratio	2.3-2.8	2.6 ± 0.2 (3)
Smaller group	7-8 × 3.5-4.5	

diameter at base and at the point where the hydrotheca becomes free. Hydrotheca adnate for less than half of its adcauline length (adnate/free ratio 0.9). Adnate part of adcauline wall convex or with a shallow invagination in the middle of its length. Abcauline wall straight or convex in its basal part; after the inflection point, first convex and then straight. Hydrothecal aperture circular, oblique and directed upwards, forming an angle of *c.* 40° with long axis of branch. Hydrotheca usually with a few renovations (Fig. 24A, B, D).

Large nematocysts relatively very small and ovoid (Fig. 30).

Gonothecae set into a coppinia with an external fence of defensive tubes forming a distally closed, onion-shaped protective structure. Gonothecae set close together (Fig. 24E) in the basal part of the coppinia, but also ascending on part of the defensive tubes (Fig. 24E). Gonothecae long and thin, with an unconspicuous distal neck with a circular aperture. Planulae completing development outside gonothecae, in the breeding chamber formed by defensive tubes.

REMARKS

Acryptolaria pseudoangulata n. sp. comes close to *A. angulata* in the general shape of the hydrothecae, but a detailed examination shows that they are different since in *A. pseudoangulata* n. sp. the hydrotheca lacks the characteristic invagination of the adnate adcauline wall present in *A. angulata*. Moreover, in the latter the branches are straight,

the nematocysts are larger (15.9 × 8.6 µm) and the hydrothecae are adnate for half of the adcauline length or more. Both species also differ in the structure of the coppinia because in *A. angulata* the coppinia is deprived of defensive tubes, whereas in *A. pseudoangulata* n. sp. there are defensive tubes forming a protective envelope.

Acryptolaria pseudoangulata n. sp. is also similar to *A. rectangularis* (Jarvis, 1922). Unfortunately, Jarvis's species is poorly known and there is no information concerning the cnidome, which makes it difficult to assign additional specimens to this species. Peña Cantero *et al.* (2007) could not examine type material of this species whose location, according to Vervoort & Watson (2003), is unknown. Anyway, Peña Cantero *et al.* (2007) provided a lengthy discussion of Jarvis's species and of the related *A. angulata* and *A. bulbosa*.

Acryptolaria pseudoangulata n. sp. resembles *A. rectangularis* in the general shape of the hydrothecae, but we believe they are different species unless the redescription of the unlocated type material of the latter proves the contrary. According to Jarvis's (1922) figures, the branches have a distinct zigzag arrangement, whereas in *A. pseudoangulata* n. sp. the branches only are slightly geniculate or straight. Jarvis (1922), when comparing its species with *A. angulata*, made it clear that *A. rectangularis* is characterized by "the straightness of the upper wall of the hydrotheca in its divergent portion". In *A. pseudoangulata* n. sp. the hydrotheca has a double curvature, being strongly curved outwards where it becomes free of the axis, where it is roughly perpendicular to the adnate portion (just as in *A. rectangularis*), but farther on it is markedly bent upwards (contrary to the "straightness" of *A. rectangularis*). Moreover, some longer hydrothecae may even present a third slight bend outwards (Fig. 24D). In addition, the hydrothecae are much longer in *A. pseudoangulata* n. sp. In *A. rectangularis* the diameter at the adnate part of the hydrotheca gradually disminishes basally, being almost fusiform, but that diameter distinctly increases in the basal, adnate part of the hydrotheca of *A. pseudoangulata* n. sp. past a narrowed part of variable extension, which forms a slight concavity (cf. Fig. 24C, D); later the diameter sharply decreases again at the hydrothecal base.

Acryptolaria pseudoundulata n. sp.
(Figs 25; 30; 32H; Table 26)

TYPE MATERIAL. — **Loyalty Islands.** MUSORSTOM 6, stn DW 457, 21°00.42'S, 167°28.71'E, 353 m, 20.II.1989, several stems on coral; 1 stem 50 mm high, holotype (MNHN-Hy.2009-0172); several incipient stems, paratype (RMNH-Coel. no. 31527).

ETYMOLOGY. — The specific name *pseudoundulata* refers to the close resemblance to *A. undulata* n. sp.; the species name is an adjective, corresponding in gender with the (feminine) name of the genus.

ECOLOGY AND DISTRIBUTION. — *Acryptolaria pseudoundulata* n. sp. was collected at a depth of 353 m in the Loyalty Islands area where it was found epibiotic on coral.

DESCRIPTION

Stem up to 50 mm high. Branching scarce (Fig. 32H) and irregular, more or less in one plane. Branches up to second order have been observed; one primary branch has three secondary branches. Branches roughly straight (Fig. 25A); anastomoses present.

Hydrothecae alternately arranged in approximately one plane (Fig. 25A), with a double bend (Fig. 25) and consequently with undulating walls: strongly curved outwards where it becomes free from the axis and slightly turned upwards soon after. The adcauline wall is convex at the adnate part and slightly concave or straight at its free portion. Abcauline wall straight or slightly convex at basal third, then with a strongly marked inflection point, forming a shallow embayment followed by an unconspicuous hump, and later on slightly concave or straight. Hydrothecal diameter largest in adnate part, but markedly decreasing at base. Diameter of free part of hydrotheca slightly narrowing towards the rim. Hydrotheca adnate for about half its adcauline length (adnate/free ratio 1.1). Hydrothecal aperture circular, oblique, directed upwards, forming an angle of *c.* 30° with long axis of branch. Rim even, frequently with renovations.

Large nematocysts relatively very large and fusiform (Fig. 30).

Coppinia not found.

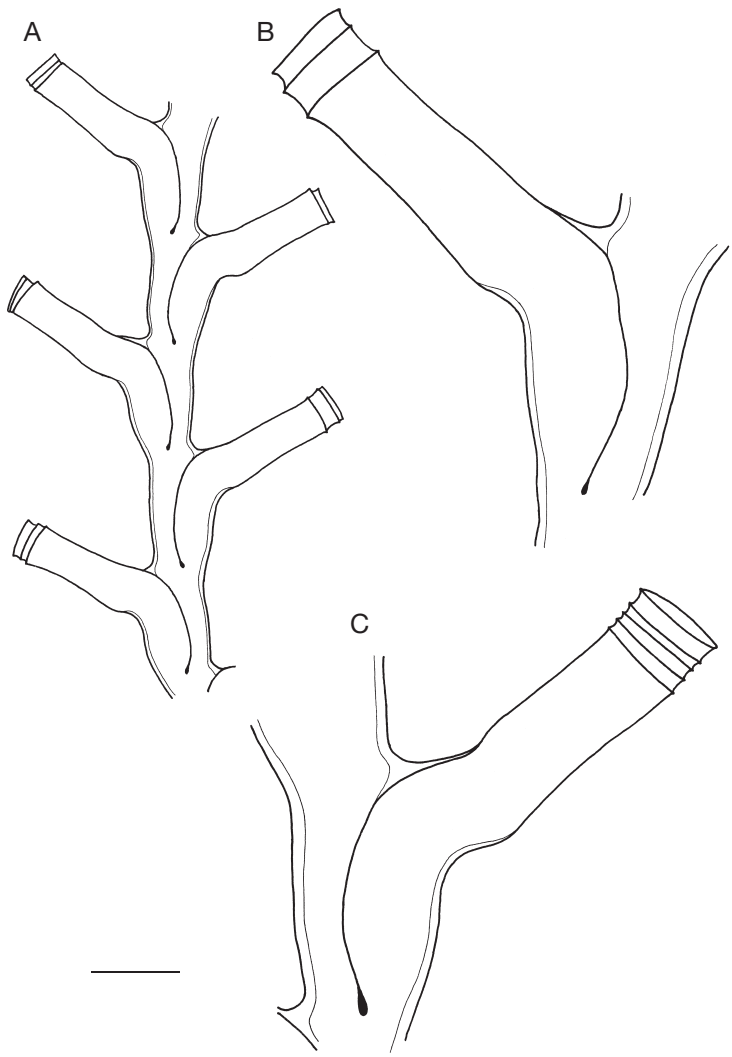

FIG. 25. — *Acryptolaria pseudoundulata* n. sp., from MUSORSTOM 6 stn DW 457: **A**, branch fragment showing hydrothecal arrangement; **B**, **C**, hydrothecae. Scale bar: A, 600 µm; B, C, 250 µm.

REMARKS

Acryptolaria pseudoundulata n. sp. is undoubtedly allied to *A. undulata* n. sp.; the relationship is discussed below, when dealing with the latter. It also resembles *A. novaecaledoniae* n. sp. in the shape of the hydrothecae, but in that species the hydrothecae are much more strongly directed outwards, the branches are straight and the nematocysts are much smaller (17.7 × 4.7 µm).

Acryptolaria pulchella (Allman, 1888)
(Figs 26; 30; 32I; Table 27)

Cryptolaria pulchella Allman, 1888: lvii, lxvii, lxviii, 40, 41, plate 19 figs 2, 2a.

Acryptolaria pulchella – Peña Cantero *et al.* 2007: 261-263, figs 13, 16E, 18E, tab. XIII.

MATERIAL EXAMINED. — **Philippines.** MUSORSTOM 3, stn DR 117, 12°31.2'-12°31.3'N, 120°39.3'-120°39.5'E,

TABLE 27. — Measurements of *Acryptolaria pulchella* (Allman, 1888) from several stations (in µm). Nematocysts from MUSORSTOM 3 stn DR 117.

	Range	Mean ± SD (n)
Hydrothecae		
Length of abcauline wall	800-950	898.6 ± 47.1 (7)
Length of adcauline wall	1050-1270	1179.3 ± 76.3 (7)
Length of free adcauline wall	360-430	399.3 ± 24.2 (7)
Length of adnate adcauline wall	650-850	765.7 ± 67.8 (7)
Ratio adnate/free adcauline wall	1.6-2.4	1.9 ± 0.2 (7)
Diameter at aperture	225-280	257.9 ± 17.3 (7)
Gonothecae		
Maximum diameter	*c.* 200	
Length of funnel	*c.* 60	
Diameter at aperture	80-90	
Nematocysts		
Larger group	20-23 × 5.5-7	21.2 ± 1.1 × 6.2 ± 0.5 (6)
Ratio	3.0-3.7	3.4 ± 0.2 (6)
Smaller group	6.5 × 2.5-3	

92-97 m, 3.VI.1985, 2 stems up to 40 mm high, in addition 1 incipient stem *c.* 5 mm high on sponge, and two fragments up to 8 mm long (RMNH-Coel. no. 31528). — Stn CP 131, 11°36.6'S, 121°43.10'E, 111-113 m, 5.VI.1985, 6 stems up to 60 mm high (MNHN-Hy.2009-0212); 1 fragment *c.* 15 mm long with coppinia on slide (RMNH-Coel no. 35422, slide 1664); 2 slides (MNHN-Hy.2009-0157; MNCN 2.03/401).

ECOLOGY AND DISTRIBUTION. — *Acryptolaria pulchella* was known only from Honolulu, Hawaii, in the Pacific Ocean, where it was found at depths between 36 and 72 m (Allman 1888). Our material was collected at depths from 92 to 113 m on sponges, in the Philippines.

DESCRIPTION

Stems strongly polysiphonic and up to 60 mm high. Branching irregular, but sometimes alternate and in one plane (Fig. 32I), branches straight (Fig. 26A).

Hydrothecae alternate, approximately in one plane (Fig. 26A), tubular, cylindrical from aperture to roughly the middle of their length; diameter decreasing in basal half (Fig. 26A-C). Hydrotheca smoothly curved outwards; adcauline wall adnate for about two-thirds of its length (adnate/free ratio *c.* 1.9), convex throughout, though occasionally basally straight; abcauline wall concave. Hydrothecal aperture circular, directed upwards, forming an angle of *c.* 30° with long axis of branch. Rim even, slightly everted, with a few short renovations.

Large nematocysts relatively large and fusiform (Fig. 30).

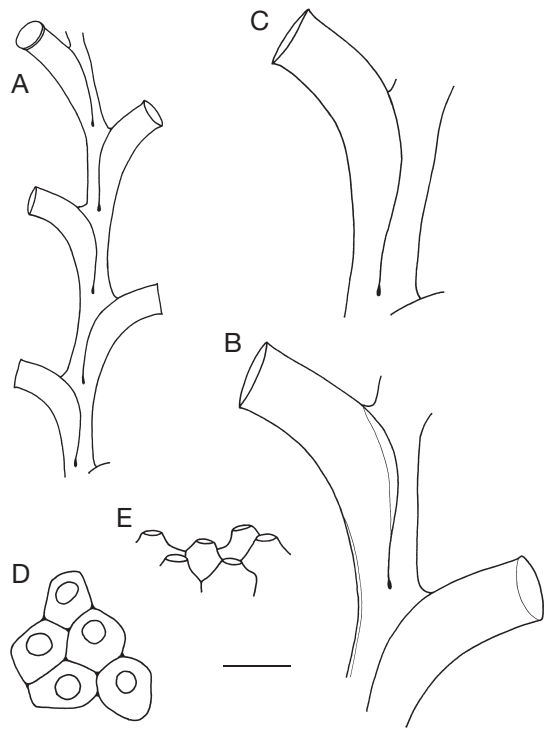

FIG. 26. — *Acryptolaria pulchella* (Allman, 1888): **A**, branch fragment showing hydrothecal arrangement; **B**, **C**, hydrothecae; **D**, part of coppinia (dorsal view); **E**, part of coppinia showing distal part of gonothecae; **A**, **B**, **D**, **E**, from MUSORSTOM 3 stn CP 131; **C**, from MUSORSTOM 3 stn DR 117. Scale bar: A, 600 µm; B-E, 250 µm.

TABLE 28. — Measurements of *Acryptolaria pygmaea* n. sp. from the holotype (in µm).

	Range	Mean ± SD (n = 10)
Hydrothecae		
Length of abcauline wall	400-520	
Length of adcauline wall	505-680	
Length of free adcauline wall	80-300	
Length of adnate adcauline wall	380-425	
Ratio adnate/free adcauline wall	1.3-5.3	
Diameter at aperture	85-100	
Nematocysts		
Larger group	27-30.5 × 10-11	28.1 ± 1.0 × 10.6 ± 0.5
Ratio	2.5-2.8	2.7 ± 0.1

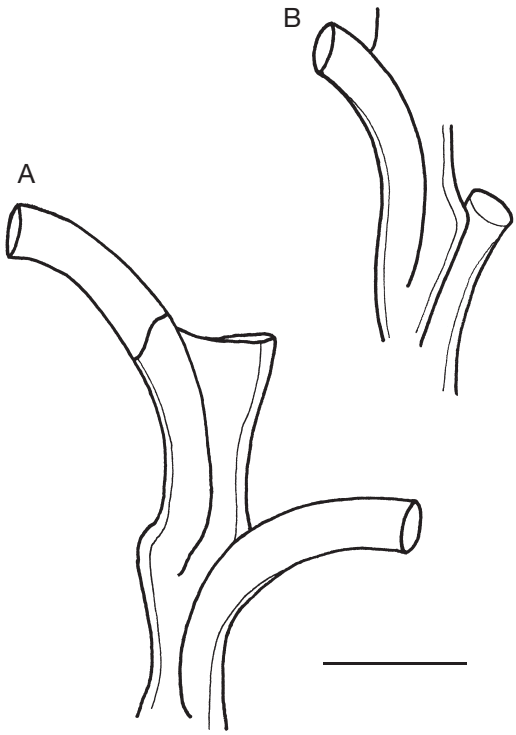

FIG. 27. — *Acryptolaria pygmaea* n. sp., from SMIB 4 stn DW 60, branch fragments showing hydrothecal arrangement and hydrothecae. Scale bar: 250 µm.

Coppiniae without defensive tubes. Gonothecae flask-shaped, tightly set together and with coalesced walls (Fig. 26D, E). Diameter strongly decreasing distally, forming a short neck (Fig. 26E) with a circular aperture (Fig. 26D, E).

REMARKS

Although Allman (1888) indicated that the gonosome was not known, the holotype examined by Peña Cantero *et al.* (2007) had coppiniae which were subsequently described by these authors. The coppinia present in our material is in complete agreement with that description. Peña Cantero *et al.* (2007) characterized this species by the relatively short and wide hydrothecae, adnate to the branches by most of the adcauline hydrothecal wall, and by the large nematocysts. Our material is in complete agreement, apart from having hydrothecae with a relatively longer free part.

Acryptolaria pygmaea n. sp.
(Figs 27; 30; 32J; Table 28)

MATERIAL EXAMINED. — **Norfolk Ridge.** SMIB 4, stn DW 60, 23°00.1'-22°59.4'S, 167°21.6'-167°21.7'E, 500-535 m, 10.III.1989, 1 stem *c.* 11 mm high, holotype (MNHN-Hy.2009-0173).

ETYMOLOGY. — The specific name *pygmaea*, latinization of the Greek adjective "pygmeios", small, refers to the dwarf hydrothecae; it follows in gender the (feminine) genus name.

ECOLOGY AND DISTRIBUTION. — *Acryptolaria pygmaea* n. sp. was collected at depths between 500 and 535 m in the Norfolk Ridge area.

DESCRIPTION

Stem 11 mm high, in bad condition and with extremely fragile perisarc. The stem has only two primary branches, each with a secondary branch (Fig. 32J).

Hydrothecae alternately arranged in approximately one plane (Fig. 27A), tubular, practically cylindrincal (Fig. 27); diameter decreasing only in the extreme basal part. Hydrotheca smoothly curved outwards, adcauline wall convex, adnate over a variable extension, from about one-half to five-sixths of its lengh (adnate/free ratio 1.3-5.3); abcauline wall concave, though straight or slightly convex in its basal part. Hydrothecal aperture circular and directed outwards, virtually parallel to long axis of branches; rim even.

Large nematocysts relatively very large and fusiform (Fig. 30).

Coppinia not observed.

REMARKS

Notwithstanding the scarcity of material, we consider that *Acryptolaria pygmaea* n. sp. is an easily identifiable species. It is well characterized by its relatively tiny hydrothecae and huge nematocysts. It is allied to *A. minuta* and *A. minima* in the size of the hydrothecae, being closer to the former by the relatively long and thin hydrothecae. However, it is easily distinguishable from these two species by the size of the nematocysts that are distinctly larger than those of *A. minima* (25.8 × 9.8 µm in the holotype) and much larger than those of *A. minuta* (16.7 × 6.3 µm in the holotype).

Acryptolaria tetraseriata n. sp.
(Figs 28; 30; 32K; Table 29)

MATERIAL EXAMINED. — **Philippines.** MUSORSTOM 3, stn DR 117, 12°31.2'-12°31.3'N, 120°39.3'-120°39.5'E, 92-97 m, 3.VI.1985, 1 stem *c.* 100 mm high, holotype (MNHN-Hy.2009-0174); 1 incipient stem *c.* 13 mm high, paratype (RMNH-Coel. no. 31529).

ETYMOLOGY. — The species name *tetraseriata* refers to the arrangement of the hydrothecae in four longitudinal rows, "tetra" being the Greek numeral four alluding to the number of series in which the hydrothecae are arranged.

ECOLOGY AND DISTRIBUTION. — *Acryptolaria tetraseriata* n. sp. was collected at a depth of 92-97 m in the Philippine region.

DESCRIPTION (BASED ON HOLOTYPE)

Main stem *c.* 100 mm high, very distinct, straight, pinnate, regularly giving rise at approximately the same interval to primary branches, alternately arranged in one plane, following a sub-opposite pattern (Fig. 32K); the first two primary branches are opposite. Primary branches also straight and roughly of same development, though slightly shorter and less developed at distal part of stem, perpendicular to main stem or slightly directed upwards, forming an angle of *c.* 70° with long axis of stem, but sometimes, particularly in the distal part, reaching 45°. In their turn the first-order branches give rise to short, much less developed and mostly monosiphonic, secondary branches. There may be anastomoses. Branches straight (Fig. 28).

Hydrothecae arranged in alternate decussate pairs, forming four longitudinal rows (Fig. 28A). In some secondary branches that arrangement may become lost because hydrothecae there are alternately arranged in two planes that form an angle of *c.* 90° with each other (Fig. 28B). Hydrotheca tubular, roughly fusiform (Fig. 28) with a diameter slightly increasing from aperture to approximately midlength, after which it decreases slightly basally; minimum diameter at the base. Operculum frequently present. Hydrotheca strongly curved outwards, with a distinct inflection point where it becomes free. Adcauline wall adnate over half its length (adnate/free ratio 1.4), slightly convex in both adnate and free portions; abcauline wall concave. Hydrothecal aperture circular and directed outwards, either parallel to long axis of branch or slightly facing upwards; rim even but slightly everted, frequently with renovations. Hydrothecae moderately immersed into the branches, with distinctly marked "step" at the origin of the abcauline wall, affecting the communication between the interior of hydrotheca and branch which from "vertical" has become "lateral".

Large nematocysts relatively very large and fusiform (Fig. 30).

Coppinia not observed.

REMARKS

Our material is undoubtedly allied to *A. tortugasensis* Leloup, 1935. There are, however, a few differences that prevent us, at present, to refer our material to that species. One of the most remarkable differences is the absence in our material of the characteristic

TABLE 29. — Measurements of *Acryptolaria tetraseriata* n. sp. from the holotype (in µm).

	Range	Mean ± SD (n)
Hydrothecae		
Length of abcauline wall	600-750	680 ± 53.4 (4)
Length of adcauline wall	815-950	886.3 ± 48.4 (4)
Length of free adcauline wall	290-450	382.5 ± 58.9 (4)
Length of adnate adcauline wall	490-525	503.8 ± 12.9 (4)
Ratio adnate/free adcauline wall	1.1-1.8	1.4 ± 0.3 (4)
Diameter at aperture	140-160	148.8 ± 7.4 (4)
Nematocysts		
Larger group	29.5-33 × 10.5-11	31.4 ± 1.2 × 10.9 ± 0.3 (10)
Ratio	2.6-3.1	2.9 ± 0.2 (10)
Smaller group	5.2 × 2	

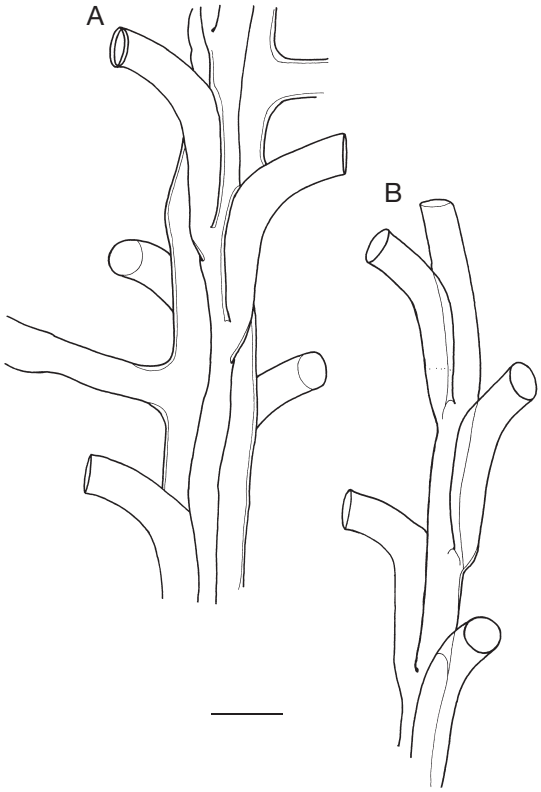

FIG. 28. — *Acryptolaria tetraseriata* n. sp., from MUSORSTOM 3 stn DR 117, branch fragments showing hydrothecal arrangement and hydrothecae. Scale bar: 250 µm.

internal abcauline perisarc cusp, in about the middle of the abcauline wall, of Leloup's species. Although the presence of internal cusps has been demonstrated to be a variable character in certain species of other genera (e.g., *Sertularella* Gray, 1848), where those cusps are associated with the hydrothecal rim, the presence of internal cusps in species of *Acryptolaria* is exceptional, as it is only known in *A. tortugasensis*. Consequently we consider its presence an important diagnostic character.

In addition, although our material share with *A. tortugasensis* the subopposite branching pattern, some primary branches in Leloup's species become much developed, acting as secondary stems, so that the degree of branching is high, whereas in our material the stem is clearly pinnate with all primary branches reaching more or less the same development. There is also difference in hydrothecal disposition, because in our material the hydrothecae form four longitudinal rows, being arranged in alternate decussate pairs, though this pattern may become less evident or even lost in the secondary branches, where the hydrothecae can be alternately arranged in two planes making a right angle and form only two longitudinal rows of hydrothecae as also happens in *A. tortugasensis*. Although they agree in the general shape and size of both hydrothecae and nematocysts, there are slight differences in these aspects too: the nematocysts in our material are slightly longer and the hydrothecae have a distinctly longer free adcauline part (cf. Table 31). In our material the abcauline hydrothecal wall is smoothly concave but in *A. tortugasensis* there is a slightly marked inflection point near the abcauline cusp, the hydrotheca being more abruptly directed outwards. Finally, there are also biogeographical

TABLE 30. — Measurements of *Acryptolaria undulata* n. sp. from the holotype (in µm).

	Range	Mean ± SD (n)
Hydrothecae		
Length of abcauline wall	1600-1700	1650 ± 40.8 (4)
Length of adcauline wall	1830-1870	1850 ± 18.3 (4)
Length of free adcauline wall	1000-1100	1052.5 ± 42.7 (4)
Length of adnate adcauline wall	760-830	797.5 ± 28.7 (4)
Ratio adnate/free adcauline wall	0.7-0.8	0.8 ± 0.1 (4)
Diameter at aperture	280-310	295 ± 12.9 (4)
Nematocysts		
Larger group	26.5-28.5 × 10.5-12	27.6 ± 0.7 × 11.2 ± 0.5 (10)
Ratio	2.3-2.7	2.5 ± 0.1 (10)
Smaller group	7.5-8 × 3.5-4	

reasons to keep both species separated, since *A. tortugasensis* is known from Tortugas, Florida, USA.

The distinct step found at the bottom of the hydrotheca is very characteristic, being only present in *A. tortugasensis* and in less-developed condition in *A. medeae* n. sp. This step sets off the abcauline hydrothecal wall from the branch, contrary to the other species of the present genus, where the basal part of the abcauline wall is either parallel to the branch or becomes gradually separated. The presence of that strong discontinuity has another important consequence. Contrary to the other species of *Acryptolaria*, in which the communication between the lumina of hydrotheca and branch occurs perpendicular to the long axis of branch, between the adcauline and the abcauline walls of the hydrotheca, in our material it takes place parallel to that axis, under the adcauline hydrothecal wall.

Acryptolaria undulata n. sp.
(Figs 29; 30; 32L; Table 30)

TYPE MATERIAL. — **Norfolk Ridge.** BIOCAL 1, stn DW 66, 24°55.435'-24°54.849'S, 168°21.678'-168°21.995'E, 515-505 m, 3.IX.1985, 1 stem 10 mm high, holotype (MNHN-Hy.2009-0175); 1 stem 12 mm high, paratype (RMNH-Coel. no. 31530); 1 stem 8 mm high, paratype (MNCN 2.03/435).

OTHER MATERIAL EXAMINED. — **Norfolk Ridge.** BIOCAL 1, stn CP 67, 24°55.443'-24°54.176'S, 168°21.550'-168°21.978'E, 500-510 m, 3.IX.1985, 1 fragment *c.* 20 mm long (RMNH-Coel. no. 35239, slide no. 826).

ETYMOLOGY. — The specific name *undulata* refers to the wavy form of the hydrotheca; it is an adjective, from the verb "undo" = to undulate, following the (female) genus name in declension.

ECOLOGY AND DISTRIBUTION. — *Acryptolaria undulata* n. sp. was collected at a depth of 500-515 m in the Norfolk Ridge area.

DESCRIPTION

Unbranched stems up to 20 mm high. Stems almost straight, forming a scarcely noticiable zigzag (Fig. 32L; Fig. 29A).

Hydrothecae in approximately one plane (Fig. 29A), undulating with a triple curvature (Fig. 29): first strongly curved outwards, then markedly bent upwards and, finally, slightly curved outwards again; hydrotheca consequently with a distinct abcauline hump. Hydrothecal diameter approximately homogeneous throughout, but decreasing basally. Moreover, the hydrotheca is slightly narrowed at the point where it becomes free and widens towards the aperture; it is adnate for less than half its adcauline length (adnate/free ratio 0.8). It has many short renovations (up to 20); the hydrothecal rim is flaring.

Large nematocysts relatively very large and fusiform (Fig. 30).

Coppinia not found.

REMARKS

Acryptolaria undulata n. sp. is unique by the shape of the hydrothecae and therefore easily recognizable. Furthermore, its nematocysts are amongst the largest

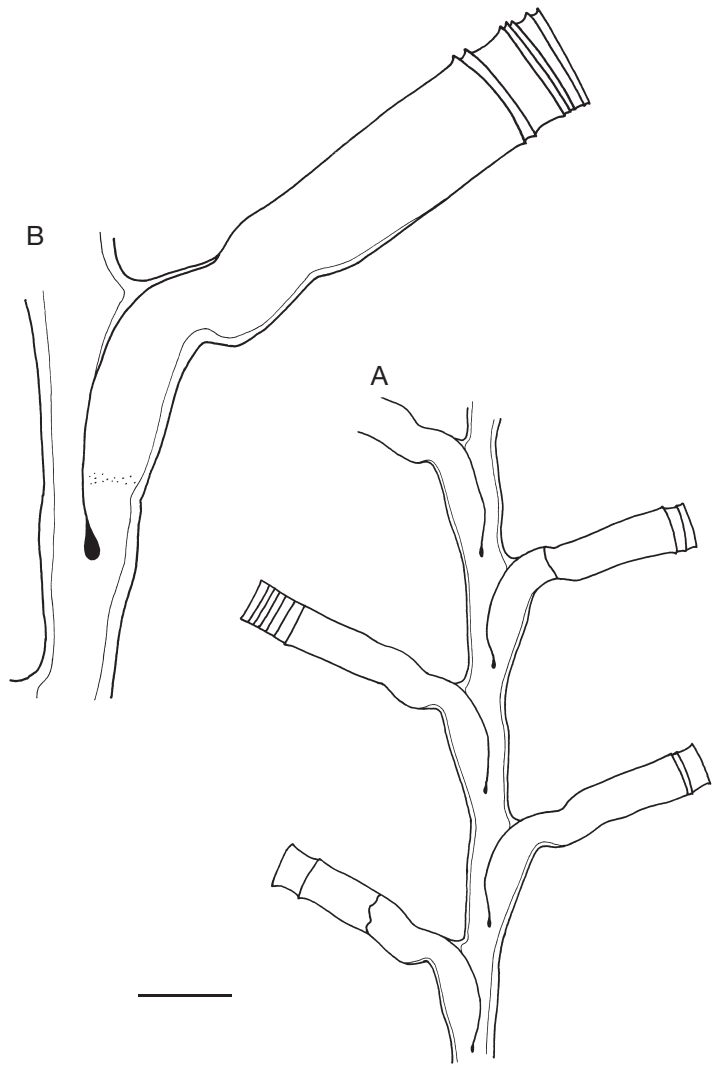

FIG. 29. — *Acryptolaria undulata* n. sp.: **A**, branch fragment showing hydrothecal arrangement; **B**, hydrotheca; **A**, from BIOCAL 1 stn CP 67; **B**, from BIOCAL 1 stn DW 66. Scale bar: A, 600 µm; B, 250 µm.

known. The material from BIOCAL 1 stn CP 67 has a stolon distally, indicating the possibility to anastomose.

As stated above, *Acryptolaria undulata* n. sp. is undoubtedly allied to *A. pseudoundulata* n. sp. Even their nematocysts are of the same size. However, *A. pseudoundulata* n. sp. is a more robust species, with distinctly wider but shorter hydrothecae (cf. Table 31). Moreover, they differ in the shape of the hydrotheca since these are curved twice in *A. pseudoundulata* n. sp., instead of three times as it occurs in *A. undulata* n. sp. Also, whereas the diameter of the hydrothecae is clearly smaller at the aperture than at the diverging point in *A. pseudoundulata* n. sp., contrary conditions are found in *A. undulata* n. sp.

TABLE 31. — Comparative morphometric data (in µm) of the type material of the species of *Acryptolaria* Norman, 1875. Note: **1**, from Jarvis's (1922) figures.

	Hydrothecae						Nematocysts	
	Abcauline wall	Adcauline wall	Free adcauline wall	Adnate adcauline wall	Adnate/ free ratio	Diameter at rim	Larger group	Ratio
A. abies	600-800	780-1056	220-380	500-680	1.7-2.7	152-216	10.5-12 × 4-5	2.2-3.0
A. angulata	784-952	706-1032	291-425	392-719	1.2-2.3	156-179	7.7-8.8 × 4.4-5.5	1.6-2.0
A. bathyalis	680-770	880-1000	140-250	700-770	3.0-5.3	150-180	20.5-23.5 × 8-9	2.3-2.9
A. bulbosa	680-760	800-864	280-440	400-520	0.9-1.9	152-160	21-23 × 6-7	3.3.-3.7
A. conferta	700-944	920-1200	280-440	560-760	1.4-2.4	180-208	19.5-21 × 7.5-9	2.3-2.7
A. corniformis	1600-1900	1770-2230	680-930	920-1300	1.1-1.6	320-400	10-15 × 3-5	2.4-3.3
A. crassicaulis	1144-1440	1392-1736	416-696	976-1120	1.5-2.7	232-256	14-16.5 × 4.5-5.5	2.8-3.1
A. disordinata	600-700	750-870	200-290	510-630	1.9-3.0	130-150	24.5-26.5 × 8.5-10	2.6-3.1
A. encarnae	1350-1450	1730-1880	580-800	1050-1200	1.4-2	245-300	19-20 × 7-8	2.5-2.8
A. flabelloides	825-900	940-1070	240-300	700-790	2.3-2.9	110-130	17-19 × 6-7	2.6-3.2
A. flabellum	700-960	840-1160	230-504	490-880	1.4-3.8	136-160	15 × 5	3.0
A. gemini	810-870	935-990	525-570	400-450	0.7-0.8	200-220	16-19 × 5.5-6	2.9-3.4
A. gracilis	760-920	960-1184	176-320	720-864	2.4-4.5	200-232	23.5-26 × 9	2.6-2.9
A. infinita	2400-2960	2470-3110	1500-2200	810-1020	0.4-0.7	300-360	14-15.5 × 7-8.5	1.4-2.1
A. intermedia	490-600	550-690	190-270	360-420	1.4-1.9	95-110	8.5-10 × 6-6.5	1.4-1.5
A. inversa	1200-1400	1360-1580	700-930	560-660	0.7-0.9	210-245	16-18 × 4.5-5	3.5-3.8
A. laertesi	1550-1700	1740-2000	750-1000	940-1100	1-1.5	260-280	27-31 × 7-7.5	3.7-4.4
A. longitheca	940-1144	1180-1400	420-680	712-784	1.1-1.8	240-280	21-23 × 6.5-8	2.8-3.5
A. medeae	400-500	550-615	135-180	370-450	2.1-3.3	105-110	17-20 × 7-8	2.4-2.8
A. minima	392-480	496-592	48-136	384-496	3-10.2	120-136	25-27 × 9-10	2.5-2.8
A. minuta	465-650	554-756	146-308	353-463	1.5-3.1	95-119	15.4-18.7 × 5.5-6.6	2.3-3.2
A. niobae	1600-1730	1750-1870	1480-1600	250-370	0.2-0.3	210-240	22-24 × 6-6.5	3.5-3.8
A. norfolkensis	740-870	920-1050	300-410	550-700	1.4-2.3	180-215	22-27.5 × 8.5-10	2.3-3.1
A. novaecaledoniae	980-1120	1230-1430	500-700	600-800	0.9-1.6	210-230	17-19 × 4.5-5	3.5-4.2
A. operculata	1800-2100	2320-2670	910-1070	1400-1700	1.3-1.9	400-450	13.5-15 × 4.5-5	2.7-3.1
A. profunda	1850-2100	2100-2330	1100-1500	760-1110	0.5-1.0	260-300	18-20 × 8-9	2.1-2.4
A. pseudoangulata	1100-1450	1200-1460	640-780	560-680	0.8-1.0	220-240	9-12 × 3-5	2.0-4.0
A. pseudoundulata	1250-1350	1500-1650	670-800	750-860	0.9-1.2	250-300	26-28 × 10-12	2.3-2.8
A. pulchella	650-800	820-1090	150-260	600-840	2.7-5	250-280	20-23 × 6-7	3.1-3.8
A. pygmaea	400-520	505-680	80-300	380-425	1.3-5.3	85-100	27-30.5 × 10-11	2.5-2.8
A. rectangularis[1]	623-769	806-1008	440-495	366-513	0.8-1	183-220		
A. tetraseriata	600-750	815-950	290-450	490-525	1.1-1.8	140-160	29.5-33 × 10.5-11	2.6-3.1
A. tortugasensis	700-720	865-950	200-380	590-700	2-3.5	150-170	28-30 × 9-10.5	2.7-3.1
A. undulata	1600-1700	1830-1870	1000-1100	760-830	0.7-0.8	280-310	26.5-28.5 × 10.5-12	2.3-2.7

GENERAL DISCUSSION

Acryptolaria is an easily recognizable genus of deep-sea benthic hydrozoans. However, the identification at the specific level was really difficult, or even impossible, because of the paucity of characters and the poorly described nominal species. Peña Cantero *et al.* (2007) tried to solve these problems revising and re-describing the type material of the, by then, known species. In their study they also realized of the key role that the cnidome plays in the idenfication of the species of *Acryptolaria*. After their study, they could recognize the existence of 16 known valid species. Nevertheless, these authors could not characterize completely some of those species because the type material either could not be found (it is probably lost) or did not allow a complete re-description (e.g., the absence of coenosarc prevents from studying the cnidome). Anyway, most of the nominal species of *Acryptolaria* were considered to represent valid species (cf. Peña Cantero *et al.* 2007).

The study of the present collection from several French expeditions in the western Pacific, mostly

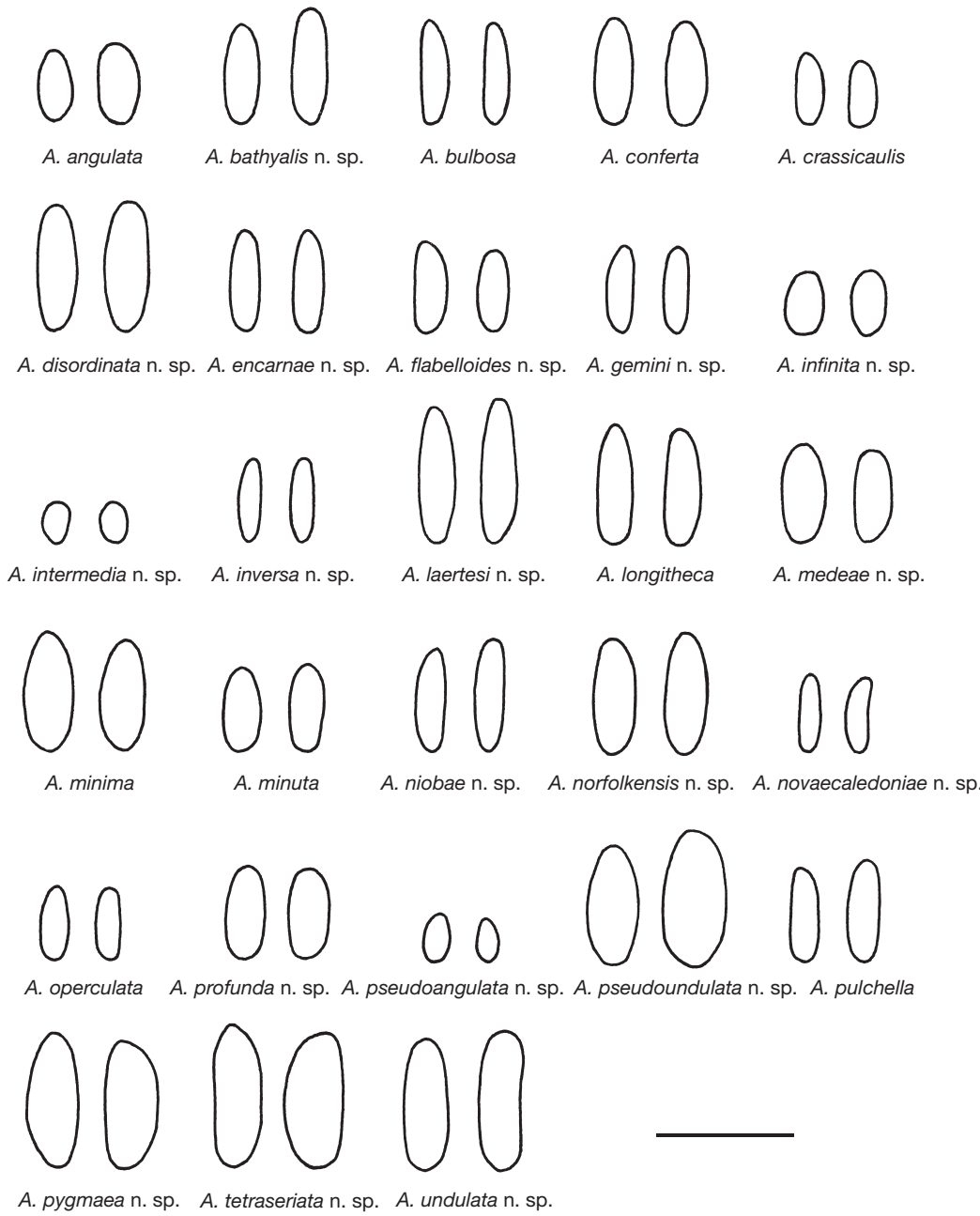

FIG. 30. — Outline drawings of the large type nematocysts of *Acryptolaria* species discussed in the present report. Scale bar: 30 µm.

in the waters around New Caledonia and neighbouring areas, has put in evidence the extremely rich diversity of *Acryptolaria* in the area studied. Twenty-nine species were found, of which 19 new to science, more than doubling the number of known species in this genus. Although this high biodiversity

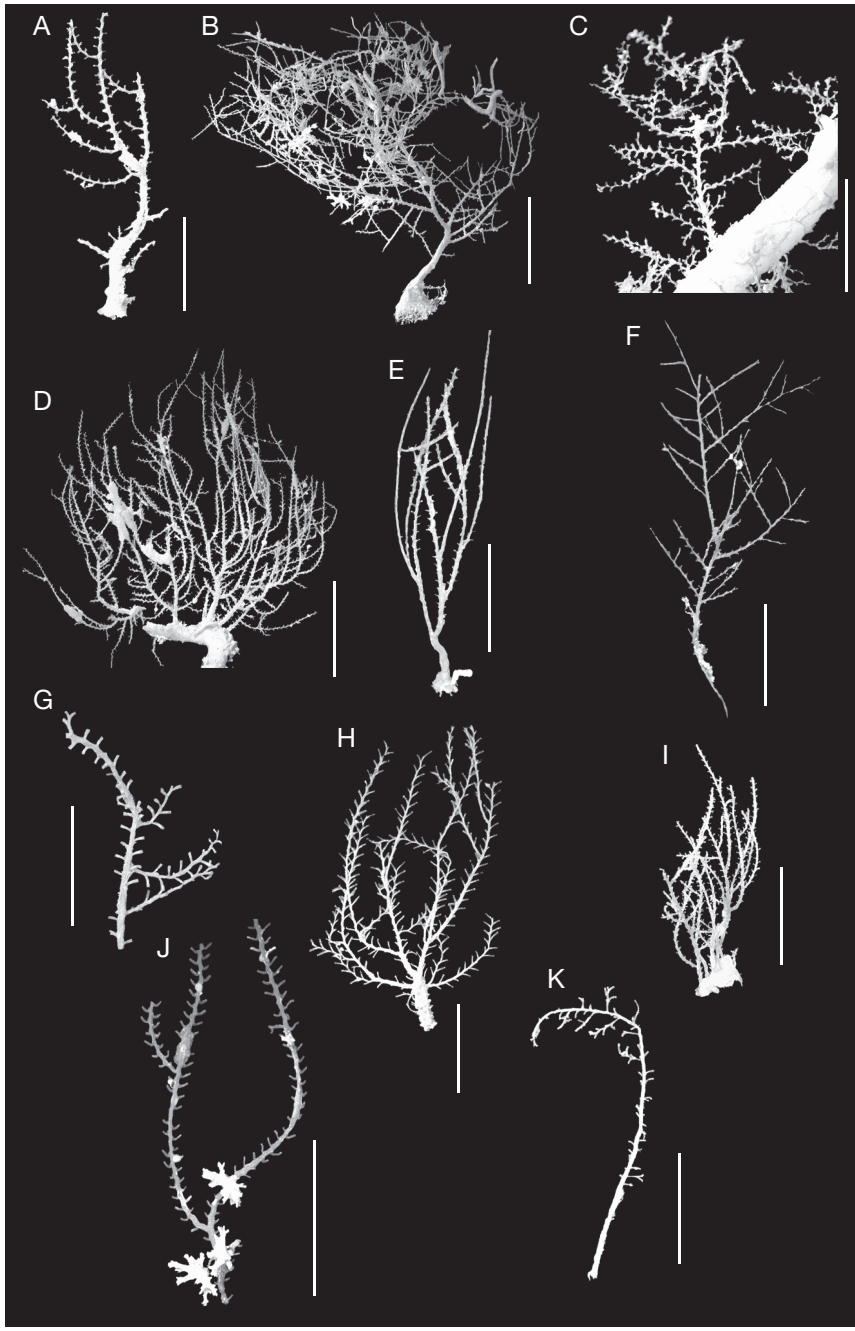

Fig. 31. — Colony shape and branching in *Acryptolaria* Norman, 1875: **A**, *A. angulata* (Bale, 1914), from MUSORSTOM 6 stn DW 487; **B**, *A. bathyalis* n. sp., holotype, MUSORSTOM 6 stn CP 419; **C**, *A. bulbosa* (Stechow, 1932), from MUSORSTOM 6 stn CP 419; **D**, *A. disordinata* n. sp., holotype, MUSORSTOM 4 stn DW 197; **E**, *A. encarnae* n. sp., holotype, MUSORSTOM 6 stn CP 464; **F**, *A. flabelloides* n. sp., from SMIB 4 stn DW 36; **G**, *A. gemini* n. sp., holotype, GEMINI stn DW 60; **H**, *A. infinita* n. sp., holotype, MUSORSTOM 4 stn DW 197; **I**, *A. intermedia* n. sp., holotype, CHALCAL 2 stn DW 76; **J**, *A. inversa* n. sp., holotype, MUSORSTOM 6 stn DW 476; **K**, *A. laertesi* n. sp., holotype, MUSORSTOM 6 stn DW 425. Scale bars: A, C, F, G, I, 10 mm; B, D, E, H, J, K, 20 mm.

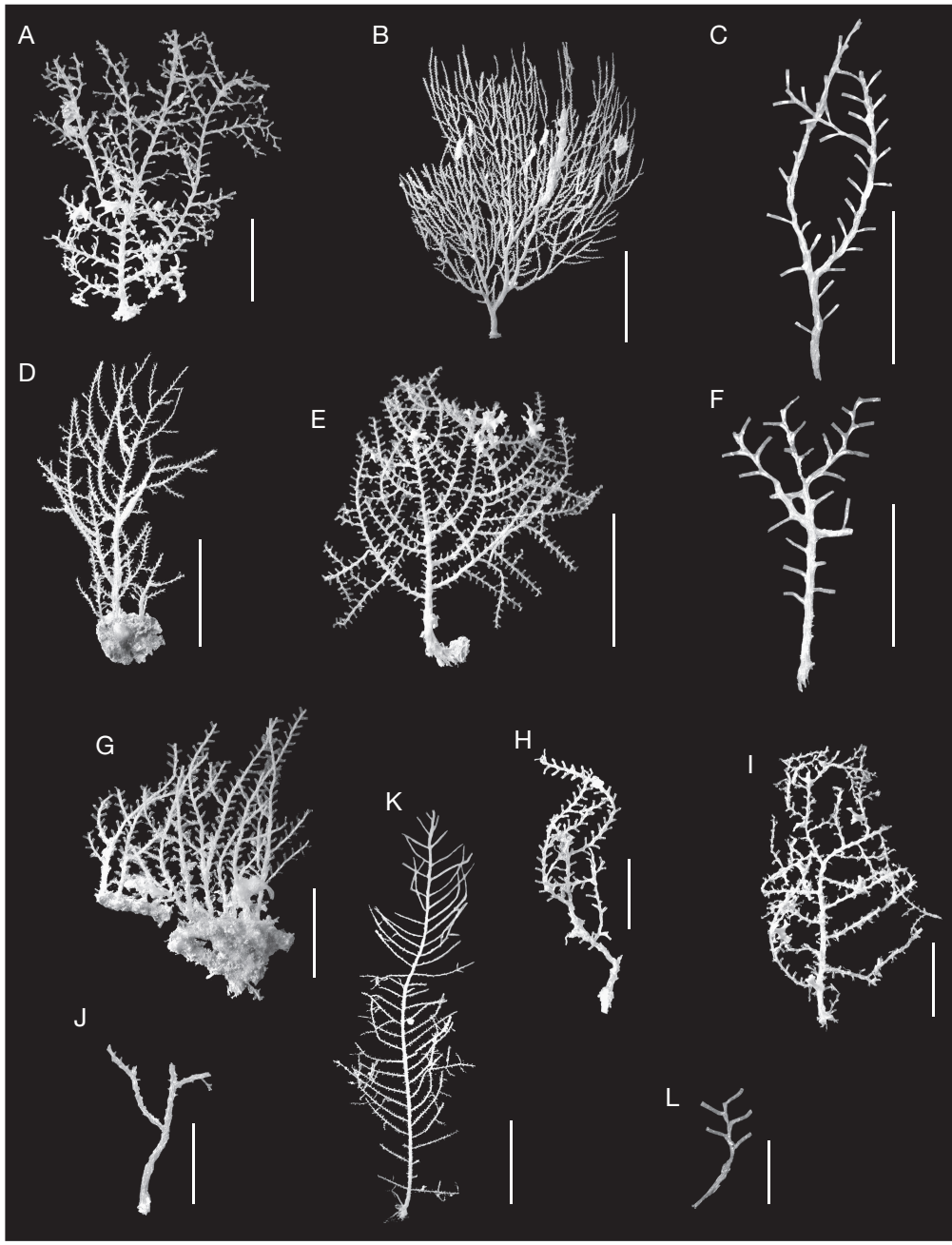

FIG. 32. — Colony shape and branching in *Acryptolaria* Norman, 1875: **A**, *A. longitheca* (Allman, 1877), from MUSORSTOM 6 stn DW 407; **B**, *A. medeae* n. sp., holotype, MUSORSTOM 4 stn CP 195; **C**, *A. niobae* n. sp., holotype, BIOCAL 1 stn DW 08; **D**, *A. norfolkensis* n. sp., holotype, BIOCAL 1 stn DW 36; **E**, *A. novaecaledoniae* n. sp., holotype, MUSORSTOM 6 stn DW 422; **F**, *A. profunda* n. sp., holotype, MUSORSTOM 6 stn DW 422; **G**, *A. pseudoangulata* n. sp., holotype, MUSORSTOM 4 stn CP 217; **H**, *A. pseudoundulata* n. sp., holotype, MUSORSTOM 6 stn DW 457; **I**, *A. pulchella* (Allman, 1888), from MUSORSTOM 3 stn DR 117; **J**, *A. pygmaea* n. sp., holotype, SMIB 4 stn DW 60; **K**, *A. tetraseriata* n. sp., holotype, MUSORSTOM 3 stn DR 117; **L**, *A. undulata* n. sp., holotype, BIOCAL 1 stn DW 66. Scale bars: A, C, F-I, 10 mm; B, D, E, K, 20 mm; J, L, 5 mm

results are amazing for the genus studied, because only 16 species were previously known all over the world, it is not surprising for the area studied, acknowledged as one of the areas from the world oceans with the highest biodiversity for many taxa, also including hydrozoans groups (e.g., *Gonaxia*, see Vervoort 1993). In addition, as stated above, the genus is characterized by the scarcity of morphological characters, so that we certainly believe that the genus could be much more diverse than it is recognized at present. This idea would be supported by the fact that the genus lacks medusoids in its life cycle and, consequently, its members have little dispersal capability what could boost reproductive isolation and speciation.

As indicated above, the species of *Acryptolaria* are found in deep waters and some of them probably have a much wider geographic and bathymetrical distribution than that shown by the present knowledge. Indeed some of the species have been recorded worldwide (e.g., *A. conferta*), but without information concerning the cnidome, as stressed by Peña Cantero *et al.* (2007), those records only can be considered doubtful.

Key to the Western Pacific species of *Acryptolaria* Norman, 1875

1. Hydrothecae irregularly directed outwards 2
— Hydrothecae homogeneously directed outwards 9

2. Hydrotheca curved twice, first outwards and then upwards 3
— Hydrotheca curved three times 8

3. Adcauline wall with strong invagination at approximately half of its adnate length ..... *A. angulata*
— Adcauline wall without that invagination 4

4. Hydrotheca small, abcauline length < 800 µm and diameter at rim ≤ 160 µm 5
— Hydrotheca large, abcauline length > 900 µm and diameter at rim > 200 µm 6

5. Length of larger nematocysts ≥ 21 µm ..... *A. bulbosa*
— Length of larger nematocysts ≤ 10 µm ..... *A. intermedia* n. sp.

6. Hydrotheca with a sharp abcauline invagination. Hydrothecal diameter slightly increasing to the aperture. Length of larger nematocysts ≤ 12 µm ..... *A. pseudoangulata* n. sp.
— If present, abcauline invagination shallow. Hydrothecal diameter slightly decreasing to the aperture. Nematocysts distinctly much larger 7

7. Length of larger nematocysts ≤ 19 µm ..... *A. novaecaledoniae* n. sp.
— Length of larger nematocysts > 26 µm ..... *A. pseudoundulata* n. sp.

8. Hydrotheca curved first outwards, then downwards and finally upwards ... *A. inversa* n. sp.
— Hydrotheca curved first outwards, later upwards and eventually outwards ..... *A. undulata* n. sp.

9. Typically four longitudinal rows of hydrothecae ..... *A. tetraseriata* n. sp.
— Always two longitudinal rows of hydrothecae 10

10. Hydrothecae large, abcauline length ≥ 1350 µm 11
— Hydrothecae typically with abcauline length ≤ 1350 µm 15

11. Hydrothecae typically adnate in more than half of its adcauline length 12
— Hydrothecae typically adnate in less than half of its adcauline length 13

12. Horn-shaped hydrotheca. Abcauline length ≥ 1600 µm. Diameter at hydrothecal rim ≥ 310 µm. Length of larger nematocysts ≤ 19 µm ..... *A. corniformis*
— Hydrothecae roughly cylindrical. Abcauline length ≤ 1450 µm. Diameter at rim ≤ 300 µm. Length of larger nematocysts ≥ 19 µm ..... *A. encarnae* n. sp.

13. Diameter at rim ≥ 300 µm 14
— Diameter at rim ≤ 240 µm. Free part of hydrotheca roughly straight. With a characteristic shelf at the junction between adcauline hydrothecal wall and branch ... *A. niobae* n. sp.

14. Hydrotheca only slightly directed outwards, very long, abcauline length ≥ 2400 µm .... *A. infinita* n. sp.
— Hydrotheca markedly directed outwards, abcauline length ≤ 2100 µm ..... *A. operculata*

15. Branches forming a distinct zigzag pattern 16
— Branches roughly straight 17

16. Length of larger nematocysts ≥ 21 µm. Length of abcauline wall ≤ 650 µm; free portion ≤ 225 µm ..... *A. conferta*
— Length of larger nematocysts ≤ 16 µm. Length of abcauline wall ≥ 730 µm; free portion ≥ 350 µm ..... *A. crassicaulis*

17. Horn-shaped hydrotheca. Diameter distinctly drecreasing at adnate part 18
— Hydrotheca roughly cylindrical; diameter more or less constant 19

18. Length of larger nematocysts ≤ 19 µm. Adcauline hydrothecal wall with a distinct invagination just before becoming adnate ..... *A. gemini* n. sp.
— Length of larger nematocysts ≥ 21 µm. Adcauline hydrothecal wall without invagination ..... *A. longitheca*

19. Branches distinctly widening at place where hydrotheca becomes free 20
— Branches not that way 23

20. Hydrotheca with a bottleneck constriction at basal part ..... *A. gracilis*
— Hydrotheca lacking that constriction 21

21. Hydrothecae roughly parallel to long axis of branch for a great extension, strongly curving outwards only at distal part. Length of larger nematocysts ≤ 19.5 µm .... *A. flabelloides* n. sp.
— Hydrothecae distinctly diverging from long axis of branch. Hydrotheca curved throughout. Length of larger nematocysts ≥ 22 µm 22

22. Diameter at rim ≤ 150 µm; length of abcauline wall ≤ 700 µm; free portion ≤ 290 µm ..... *A. disordinata* n. sp.
— Diameter at rim ≥ 180 µm; length of abcauline wall ≥ 740 µm; free portion ≥ 300 µm ..... *A. norfolkensis* n. sp.

23. Hydrotheca roughly cylindrical. Diameter at rim ≤ 180 µm 24
— Hydrothecal diameter decreasing in basal half. Diameter at rim ≥ 225 µm ... *A. pulchella*

24. Length of abcauline wall ≥ 680 µm; diameter at rim ≥ 150 µm ..... *A. bathyalis* n. sp.
— Length of abcauline wall ≤ 600 µm; diameter at rim ≤ 140 µm 25

25. Length of larger nematocysts ≤ 20 µm 26
— Length of larger nematocysts ≥ 22 µm 27

26. Hydrotheca slightly curved outwards. Abcauline hydrothecal wall with strong perisarc development not reaching hydrotheca below. Diameter at rim ≤ 110 µm .... *A. medeae* n. sp.
— Hydrotheca strongly curved outwards. Perisarc of abcauline hydrothecal wall little developed and reaching hydrotheca below. Diameter at rim ≥ 115 µm ..... *A. minuta*

27. Length of larger nematocysts ≤ 26 µm. Diameter at rim ≥ 115 µm ..... *A. minima*
— Length of larger nematocysts ≥ 27 µm. Diameter at rim ≤ 100 µm .... *A. pygmaea* n. sp.

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