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Two new genera and nine new species of hydroids (Cnidaria: Hydrozoa) from off New Caledonia

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Abstract. Two new genera and nine new species of hydroids are described based on deep-water material collected from off New Caledonia during various expeditions of the French Tropical Deep-Sea Benthos program. *Caledoniana* gen. nov., provisionally included in the family Sertulariidae Lamouroux, 1812, presently comprises three new species, viz. *C. alata* sp. nov., *C. decussata* sp. nov., and *C. microgona* sp. nov., while an additional group of three new species, is accommodated in the new sertulariid genus *Solenoscyphus* gen. nov.: *S. candelabrum* sp. nov., *S. decidualis* sp. nov., and *S. striatus* sp. nov. Furthermore, three new species of *Hincksella* Billard, 1918 (family Syntheciidae Marktanner-Turneretscher, 1890) are described, namely *H. cornuta* sp. nov., *H. neocaledonica* sp. nov., and *H. similis* sp. nov.

Key words. New species, western Pacific, deep-water.

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Introduction

Large collections of hydroids were gathered during numerous French expeditions, conducted conjointly by the Institut de Recherche pour le Développement (IRD, formerly ORSTOM) and the Muséum national d'Histoire naturelle (MNHN) of Paris, in the tropical southwestern Pacific. Launched early in the 1980's as the MUSORSTOM campaigns and continuing until today under the name Tropical Deep-Sea Benthos, these expeditions aimed at exploring the deep-sea fauna (down to 1500 m) of a vast geographical area extending from Taiwan to the Marquesas, and encompassing the Philippines, the Banda Sea, the Solomon Islands, New Caledonia, Vanuatu, Wallis and Futuna, Fiji, Tonga, and the Austral Islands (Bouchet *et al*. 2008).

Accounts of some genera and/or families of hydroids secured by these expeditions have already been published over the last two decades: Sertulariidae and, to a much lesser extent, Thyroscyphidae (Vervoort 1993), Halopteriddidae (Ansín Agís *et al*. 2009), *Acryptolaria* (Peña Cantero & Vervoort 2010), and Kirchenpaueriidae (Ansín Agís *et al*. 2014).

A collection of specimens not studied by Vervoort (1993) or collected after the publication of his monograph, comprising species belonging to various genera of Sertulariidae, Syntheciidae,

Thyroscyphidae, Campanulariidae, and Haleciidae, was entrusted to me for study. The present report is the first account, based on a fraction of the material in this collection, and deals particularly with nine new species of hydroids, of which six are accommodated in two new genera of sertulariids, while the remaining three belong to the syntheciid genus *Hincksella* Billard, 1918.

Material and methods

The methods of study were described in detail by Galea (2007, 2008). Station numbers, as indicated in the text, are preceded by a two-letter prefix referring to the sampling gear used to secure the material, either a Warén dredge (DW) or a beam trawl (CP). The material is deposited in the collections of MNHN.

Results

Phylum Cnidaria Verrill, 1865
Class Hydrozoa Owen, 1843
Subclass Hydroidolina Collins & Marques, 2004
Order Leptothecata Cornelius, 1992
Family Sertulariidae Lamouroux, 1812

Genus ***Caledoniana*** gen. nov.
urn:lsid:zoobank.org:act:7D2C6D92-C02C-4977-A568-4A5F277389A4

Diagnosis

Erect, loosely-branched, fan-shaped, weakly-fascicled colonies; branching pattern sparing and irregular; division into internodes indistinct; hydrothecae given off in opposite, though not contiguous pairs, except for the first hydrothecae of the side branches which are unpaired; successive pairs of hydrothecae either coplanar or, occasionally, adopting a decussate arrangement; hydrothecae very large, tubular, free for at least half their length, closed by rounded, deciduous opercula; gonothecae club-shaped to piriform, inserted slightly laterally, below the hydrothecal bases.

Etymology

Named after the area of occurrence of its species, New Caledonia. The genus name is a feminine noun.

Type species

Caledoniana alata sp. nov.

Remarks

The new genus is provisionally placed within the family Sertulariidae owing to the presence of hydrothecal opercula, though molecular analyses, based on freshly-collected samples, are needed to confirm this.

Together with *Gigantotheca* Vervoort & Watson, 2003, *Caledoniana* gen. nov. is distinguished from other genera through the presence of huge, tubular hydrothecae, both genera forming a clearly distinct group within the family. Unlike *Gigantotheca*, in which the hydrothecae are alternate, those of *Caledoniana* gen. nov. are grouped in opposite pairs, analogous to the generic separation of *Hincksella* Billard, 1918 and *Synthecium* Allman, 1872, respectively, in the family Syntheciidae.

The hydrothecae of *Caledoniana* gen. nov. superficially resemble those of *Staurotheca* Allman, 1888, especially through the presence of deciduous opercula with no definite points of attachment (see Peña Cantero *et al.* 1997: 336). However, the hydrothecae of the latter are arranged in two or multiple

longitudinal rows, they are generally deeply immersed in both stems and branches, and their size is much smaller in all species described so far (Peña Cantero *et al.* 1997, 1999; Peña Cantero & Vervoort 2003a, 2003b).

Staurotheca megalotheca Vervoort & Watson, 2003, a species of so far uncertain generic position, possesses huge hydrothecae arranged in either opposite pairs or decussate groups of three (Vervoort & Watson 2003), suggesting obvious affinities with *Caledoniana* gen. nov., in particular with *C. decussata* sp. nov. (see below).

Key to species

1. Free part of hydrothecae curved upward ……***C. alata*** sp. nov.
– Free part of hydrothecae straight ……2

2. Some pairs of hydrothecae adopting a decussate arrangement ……***C. decussata*** sp. nov.
– Successive pairs of hydrothecae always coplanar ……***C. microgona*** sp. nov.

Caledoniana alata sp. nov.
urn:lsid:zoobank.org:act:9B3A55AF-D726-41DA-AA96-B3D8B9836BC5
Figs 1A, 2A–B; Table 1

Diagnosis

Colonies lightly fascicled basally, loosely branched, coplanar; nodes indistinct, internodes short; hydrothecae in opposite pairs and coplanar series; long, tubular, free part distinctly curved upward; gonothecae large, piriform.

Fig. 1. A. *Caledoniana alata* gen. et sp. nov., holotype (below) and paratype (above). **B**. *Caledoniana decussata* gen. et sp. nov., colony silhouette (part of holotype). **C**. *Caledoniana microgona* gen. et sp. nov., colony silhouette (holotype). The red arrows indicate the presence of gonothecae. Scale bars: 1 cm.

Etymology

From the Latin *ālātus*, meaning "winged", making reference to the shape of the hydrothecae, recalling the wings of a gliding bird.

Type material

Holotype

NEW CALEDONIA: campaign Bathus 4, station DW923, 18°52' S, 163°24' E, 502–470 m, 6 Aug. 1994; 3.6 cm high, branched fragment bearing a mature gonotheca (IK-2012-10287).

Paratype

NEW CALEDONIA: data as for holotype; 4.6 cm high, branched fragment bearing a mature and an immature gonotheca (IK-2012-10288).

Description

Two stem fragments, 3.6 and 4.6 cm high, with no hydrorhizae, possibly detached at base from same colony; lightly fascicled proximally, with a few accessory tubes creeping over main tube bearing hydrothecae. No evident division into internodes, even in monosiphonic parts. Each equivalent of internode short, accommodating pair of opposite, though not contiguous, hydrothecae. Single side branches, given off laterally from below a stem hydrotheca, occur in both specimens; structure similar to that of stem, except for first hydrotheca, which is unpaired. Hydrothecae large, tubular, immersed for about half their length into their corresponding internodes; free parts bent at nearly right angles to internodes, then curving upwards toward their middle; diameter nearly constant for most of length, slightly expanding toward aperture; rim with thickened perisarc; in frontal view, aperture semi-circular on adaxial side and somewhat flattened on abaxial side; a filmy, rounded operculum observed in one hydrotheca, but opercula likely deciduous. Gonothecae large and pyriform, with no distinct aperture; at least three large, globular structures (oocytes or young embryos) present in one of them. Numerous, large foramina (obliterated by thin pellicle of perisarc) below each hydrotheca suggest that gonothecae may occur in pairs in fully fertile specimens. Coenosarc badly preserved, not suitable for tentacle counting or cnidome studies.

Remarks

The hydrothecae are so large that sand grains partially or totally fill their lumina. In this case, the finding of an operculum closing the aperture of a hydrotheca is truly fortunate.

Caledoniana decussata sp. nov.

urn:lsid:zoobank.org:act:B302DBC1-9E6F-427F-A3B6-3843F8FAE77C

Figs 1B, 2C–D; Table 1

Diagnosis

Colonies lightly fascicled basally, loosely branched, coplanar; nodes indistinct, internodes relatively short; hydrothecae in opposite pairs in both coplanar and decussate series; long, tubular, free part straight.

Etymology

From the Latin *dĕcusso*, meaning "to form or create a cross in the form of an X", to characterize the arrangement of the hydrothecal pairs in this species.

Material examined

Holotype

NEW CALEDONIA: campaign Bathus 2, station CP737, 23°03' S, 167°00' E, 357–400 m, 13 May 1993; 5.5 cm high, sterile colony attached to mineral concretion and adjacent sponge, as well as 3 smaller fragments detached from it (IK-2012-10289).

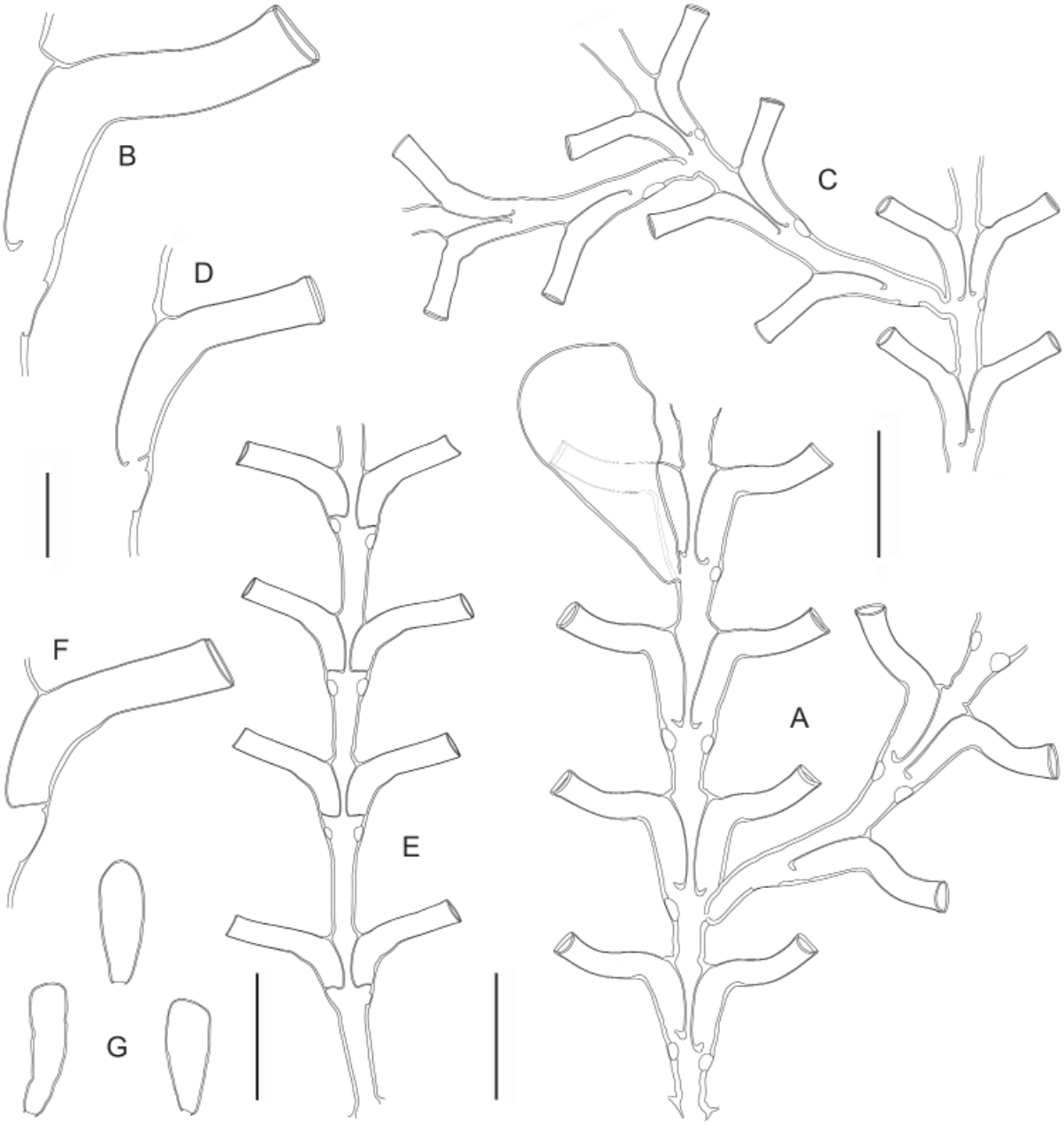

Fig. 2. — **A**–**B**. *Caledoniana alata* gen. et sp. nov. **A**. Portion of fertile stem (note gonotheca above) and basal part of a side branch, showing positions of hydrothecae. **B**. Hydrotheca. — **C**–**D**. *Caledoniana decussata* gen. et sp. nov. **C**. Portion of stem with first and second order side branches from region of colony with coplanar hydrothecae, showing their relative position. **D**. Hydrotheca. — **E**–**G**. *Caledoniana microgona* gen. et sp. nov. **E**. Portion of stem. **F**. Hydrotheca. **G**. Three gonothecae. Scale bars: A, C, E, G = 3 mm; B, D, F = 1 mm.

Description

Colony erect, 5.5 cm high, arising from rhizoid stolon firmly attached to substrate. Basal part of stem fascicled, with several accessory tubes creeping over main tube; in monosiphonic parts, division into internodes indistinct; each equivalent of internode relatively short, bearing a pair of opposite, though not contiguous, hydrothecae. Branching sparse and irregular, up to 2nd order; side branches given off singly or in pairs from below a stem hydrotheca; stem and side branches coplanar; structure of latter similar to that of stem, except for first hydrotheca, which is usually unpaired, though a pair of hydrothecae also occurs within colony. Basal parts of stem and side branches with successive pairs of hydrothecae in coplanar series; more distally, pairs become decussate. Hydrothecae large, tubular, adnate for about half of length, or less, to corresponding internodes; free part bent at about 45°; diameter nearly constant throughout, slightly expanding at rim; rim conspicuously thickened; aperture circular in frontal view; opercula not seen. Gonothecae absent, though basal remains at insertion of one of these (below a hydrotheca) present; numerous, large foramina (obliterated by thin pellicle of perisarc) below most hydrothecae, making the possibly future insertion points for them. Coenosarc badly preserved, not suitable for tentacle counting or cnidome studies.

Caledoniana microgona sp. nov.
urn:lsid:zoobank.org:act:798CB04B-5AB6-48B2-962D-AD9F6FE56D65
Figs 1C, 2E–G; Table 1

Diagnosis

Colonies lightly fascicled basally, loosely branched, coplanar; nodes indistinct, internodes relatively long; hydrothecae in opposite pairs and coplanar series; long, tubular, free part slightly convex basally, then straight; gonothecae small, club-shaped.

Etymology

From the Greek *μικρός*, meaning "small", and *γόνος*, meaning "seed", to characterize the size of its gonothecae.

Material examined

Holotype

NEW CALEDONIA: campaign Biocal, station DW46, 22°53' S, 167°17' E, 570–610 m, 30 Aug. 1985; 7.3 cm high colony with one gonotheca (IK-2012-10290).

Paratypes

NEW CALEDONIA: data as for holotype; numerous fragmented stems up to 6.3 cm high, some sterile, as well as several detached gonothecae (IK-2012-10291).

Description

Colonies erect, up to 7 cm high, fan-shaped, loosely fascicled on basal portions of stems and some lower side branches. Main tube indistinctly divided into moderately long internodes, each of them bearing a distal pair of opposite, though not contiguous, hydrothecae. Side branches sparse, given off irregularly and laterally from below a hydrotheca; up to 2nd order branching. First hydrotheca of side branch commonly unpaired, although one colony with paired hydrothecae. Hydrothecae large and tubular, immersed for about one-third of adaxial length into internode; free part of nearly constant diameter, projecting outward at wide angle; abaxial wall slightly tumid at inflexion point, then straight distally; free adaxial side slightly convex basally, then parallel to abaxial counterpart; rim thickened; aperture borne on slight terminal constriction of hydrothecal wall; in frontal view rounded on adaxial side and flattened abaxially; opercula not seen. Gonothecae given off slightly laterally from below bases

Table 1. Measurements of species of *Caledoniana* gen. nov., in µm.

	***C. alata* sp. nov.**	***C. decussata* sp. nov.**	***C. microgona* sp. nov.**
Stem			
"Internode" length	3500–4000	2500–3000	3000–3700
Diameter at "node"	675–735	530–665	445–665
Hydrotheca			
Adaxial side free	2265–2530	1730–1875	2100–2475
Adaxial side adnate	1980–2420	1620–1830	1170–1420
Abaxial side	3845–4130	2860–3075	2630–2955
Width	615–725	465–510	530–590
Diameter at rim	650–870	515–550	495–605
Gonotheca			
Length	6250 (gonotheca #1) 6750 (gonotheca #2)	–	2750–3250
Maximum width	3300 (gonotheca #1) 2600 (gonotheca #2)	–	1040–1160

of hydrothecae; small and club-shaped, with thick perisarc. Coenosarc badly preserved, not suitable for tentacle counting or cnidome studies.

Remarks

Like in *C. decussata* gen. et sp. nov., the free parts of the hydrothecae of this species are almost straight, thus differing from the sigmoid shape met with in *C. alata* gen. et sp. nov. However, in *C. decussata* gen. et sp. nov. the hydrothecal pairs may exhibit a decussate arrangement; their free part is comparatively shorter, while the adnate one is longer.

Genus ***Solenoscyphus*** gen. nov.

urn:lsid:zoobank.org:act:B69365F9-2052-4A94-8AF4-2456E46DA678

Diagnosis

Colonies of various sizes and shapes, from irregularly branched to pinnate, with either mono- or polysiphonic stems; cladia always monosiphonic. Hydrothecae long, tubular, with either straight or curved axes, adnate for less than half their length to the internodes; bases as complete septa; opercula filmy and rounded in shape, with indistinct points of attachment, clearly deciduous. Perisarc either smooth or finely and densely striated. Gonothecae unknown.

Type species

Solenoscyphus candelabrum sp. nov.

Etymology

From the Greek *σωληνοειδής*, meaning "tubular", and *σκύφος*, meaning "cup", to characterize the shape of the hydrothecae. It is a masculine noun.

Remarks

Unlike other sertulariid genera whose hydrothecae are provided with either an adaxial (*Abietinaria* Kirchenpauer, 1884, *Diphasia* Agassiz, 1862, *Idiellana* Cotton & Godfrey, 1942, and *Papilionella*

Antsulevich & Vervoort, 1993) or an abaxial (*Salacia* Lamouroux, 1816 and *Thuiaria* Fleming, 1828) opercular flap (Bouillon *et al*. 2006), the new genus possesses a deciduous operculum with no definite point of attachment.

In this respect, it shows similarities with both *Caledoniana* gen. nov. and *Staurotheca* Allman, 1888, and this may prove to be equally true for *Gigantotheca* Vervoort & Watson, 2003 as well. As shown above, *Caledoniana* gen. nov. is characterized by the presence of huge hydrothecae, a situation not met with in any of the three species described below. On the other hand, *Staurotheca* comprises a majority of species exhibiting a characteristic arrangement of the hydrothecae in decussate groups, although in a few cases they are either subopposite (*S. amphorophora* Naumov & Stepanjants, 1962, *S. australis* Peña Cantero *et al*., 1997, and *S. vervoorti* El Beshbeeshy, 2011) or decidedly alternate (*S. abyssalis* Peña Cantero & Vervoort, 2003 and *S. profunda* Peña Cantero & Vervoort, 2003). In addition, the hydrothecae of most species of *Staurotheca* are deeply immersed in both the stem and side branches; they characteristically curve outwards and their bases are often incomplete septa. Moreover, the colony shape in that genus is radically different, ranging from bush-like (with no distinct stems) to fan-shaped or tree-like (Peña Cantero & Vervoort 2003a). Unlike the tropical *Solenoscyphus* gen. nov., Allman's (1888) genus is essentially Antarctic, with a few species also occurring in the sub-Antarctic and some localities in South America (Peña Cantero & Vervoort 2003a).

Key to species

1. Free part of hydrothecae curved upward …….***S. candelabrum*** sp. nov.
– Free part of hydrothecae straight ……2

2. Perisarc striated throughout, apex of hydrotheca swollen …….***S. striatus*** sp. nov.
– Perisarc smooth, hydrotheca isodiametric throughout …….***S. deciduali*s** sp. nov.

Solenoscyphus candelabrum sp. nov.
urn:lsid:zoobank.org:act:88847458-73D4-42B1-B553-4AD070BC2AFA
Figs 3A, 4A–B; Table 2

Diagnosis

Colonies regularly pinnate, stems polysiphonic, cladia always monosiphonic; nodes indistinct; stem internodes composed of an apophysis, an axillary hydrotheca, two alternate hydrothecae above, another apophysis opposite to the former, and an axillary hydrotheca; cladial internodes, each with one hydrotheca; hydrothecae alternate throughout, long, tubular, free part distinctly concave, facing upward; operculum deciduous.

Etymology

From the Latin *candēlābrum*, meaning "candlestick", with reference to the shape of the hydrothecae, the whole colony resembling a phantasmagoric candelabrum with an infinity of arms. Used as a noun in apposition.

Material examined

Holotype

NEW CALEDONIA: campaign Bathus 4, station DW923, 18°52' S, 163°24' E, 502–470 m, 6 Aug. 1994; 9.0 cm high, sterile colony (IK-2012-10292).

Paratypes

NEW CALEDONIA: data as for holotype; four sterile colonies 5.7–12.0 cm high (IK-2012-10293).

Description

Stems up to 12 cm high, arising from disc-shaped hydrorhizae firmly attached to substrate; strongly polysiphonic basally, uniformly grading to monosiphonic towards apices; auxiliary tubes running up, nearly parallel to main tube and establishing occasional anastomoses with each other. Nodes generally poorly indicated, though division into internodes with apparently unusual repetitive sequence: proximal node, short lateral apophysis (supporting a cladium), axillary hydrotheca, two alternate hydrothecae above, second cladial apophysis on opposite side to former, axillar hydrotheca, and distal node. Cladia pinnately arranged, given off at about 70° to stem, up to 3 cm long; straight, unbranched, exclusively monosiphonic; inserting on corresponding stem apophyses by means of short, rectangular, ahydrothecate internodes; nodes indistinct. Hydrothecae of both stem and cladia biseriate, alternate, and coplanar; tubular, S-shaped, facing out- and upward; a prominent internal perisarc thickening occurring along median line of lower half of abaxial wall, together with a transverse ridge arising from middle part of perisarcal thickening, and extending over both "frontal" and "dorsal" sides of theca; elsewhere perisarc relatively thin; in frontal view, aperture of hydrotheca rounded adaxially and slightly flattened abaxially; deciduous opercula rarely seen at apertures of some hydrothecae. Gonotheca unknown.

***Solenoscyphus deciduali*s** sp. nov.

urn:lsid:zoobank.org:act:E4FDE6E2-065E-43CC-B978-126563826AA9

Figs 3B, 4C–D; Table 2

Diagnosis

Colonies regularly pinnate, stems polysiphonic, cladia always monosiphonic; nodes indistinct; stem internodes composed of two alternate hydrothecae, an apophysis, and an axillary hydrotheca; cladial internodes each with one hydrotheca; the latter alternate, long, tubular, free part slightly convex basally, then straight; operculum deciduous.

Etymology

From the Latin *dēcĭdŭus*, meaning "deciduous", with reference to the condition of the hydrothecal operculum.

Material examined

Holotype

NEW CALEDONIA: campaign Biocal, station DW38, 23°00' S, 167°15' E, 360 m, 30 Aug. 1985; 4.0 cm high, sterile colony (IK-2012-10294).

Description

Essential part of hydrorhiza missing, but remains of what appears to be a rhizoid stolon, firmly attached to substrate, could be seen. Colony erect and pinnate, *ca*. 4 cm high. Stem lightly fascicled basally, grading to monosiphonic distally; auxiliary tubes fused to one another, forming outer layer of perisarc enveloping main tube; monosiphonic part of stem with indistinct nodes; equivalents of internodes composed of proximal "node", two alternate hydrothecae, short lateral apophysis (supporting cladium) on side opposite to second hydrotheca, axillary hydrotheca, and distal "node". Cladia up to 1.2 cm long, inserted on corresponding stem apophyses, occurring at an angle of about 70° with stem; nodes indistinct; equivalents of internodes relatively short, each carrying a hydrotheca on its distal half. Hydrothecae of both stem and cladia biseriate, alternate, given off at 70–75° to "internodes"; tubular, adnate for one-fourth of adaxial length; both free adaxial and abaxial walls parallel, imperceptibly convex to almost straight; rim even, aperture circular, placed at right angle to axis of theca; rare, rounded opercula close apertures of some hydrothecae. Gonotheca unknown.

Solenoscyphus striatus sp. nov.
urn:lsid:zoobank.org:act:6ED544D2-AD80-469D-AF97-DFE1062D6E0D
Figs 3C, 4E–G; Table 2

Diagnosis

Colonies lightly fascicled basally; branching irregular, in one plane; nodes indistinct; each internode relatively short, bearing a hydrotheca; the latter long, tubular, facing outward and upward, apically swollen; operculum deciduous; perisarc of colonies densely and finely striated.

Etymology

From the Latin *strĭātus*, meaning "marked with striae", to characterize the external condition of the perisarc.

Material examined

Holotype

NEW CALEDONIA: campaign Bathus 2, station CP737, 23°03' S, 167°00' E, 357–400 m, 13 May 1993; sterile colony fragment 5.2 cm high (IK-2012-10295).

Paratype

NEW CALEDONIA: data as for holotype; sterile colony fragment 3.1 cm high (IK-2012-10296).

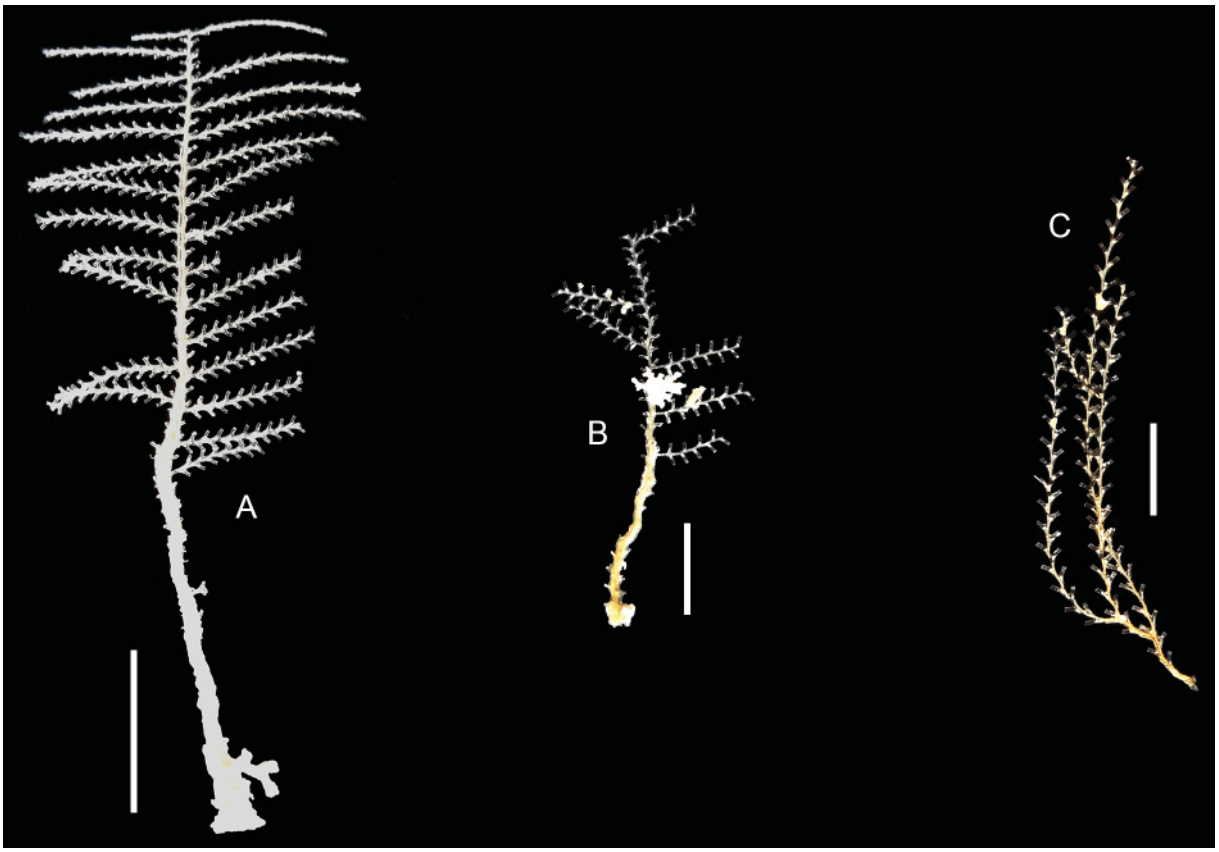

Fig. 3. A. *Solenoscyphus candelabrum* gen. et sp. nov., colony silhouette (holotype). **B**. *Solenoscyphus deciduallis* gen. et sp. nov., colony silhouette (holotype). **C**. *Solenoscyphus striatus* gen. et sp. nov., colony silhouette (holotype). Scale bars: A = 2 cm; B–C = 1 cm.

Description

Smaller specimen (paratype) 3.1 cm high, comprising a branched fragment of either a stem or a side branch; larger specimen (Fig. 3C, holotype) 5.2 cm high, possibly a branched stem missing hydrorhiza;

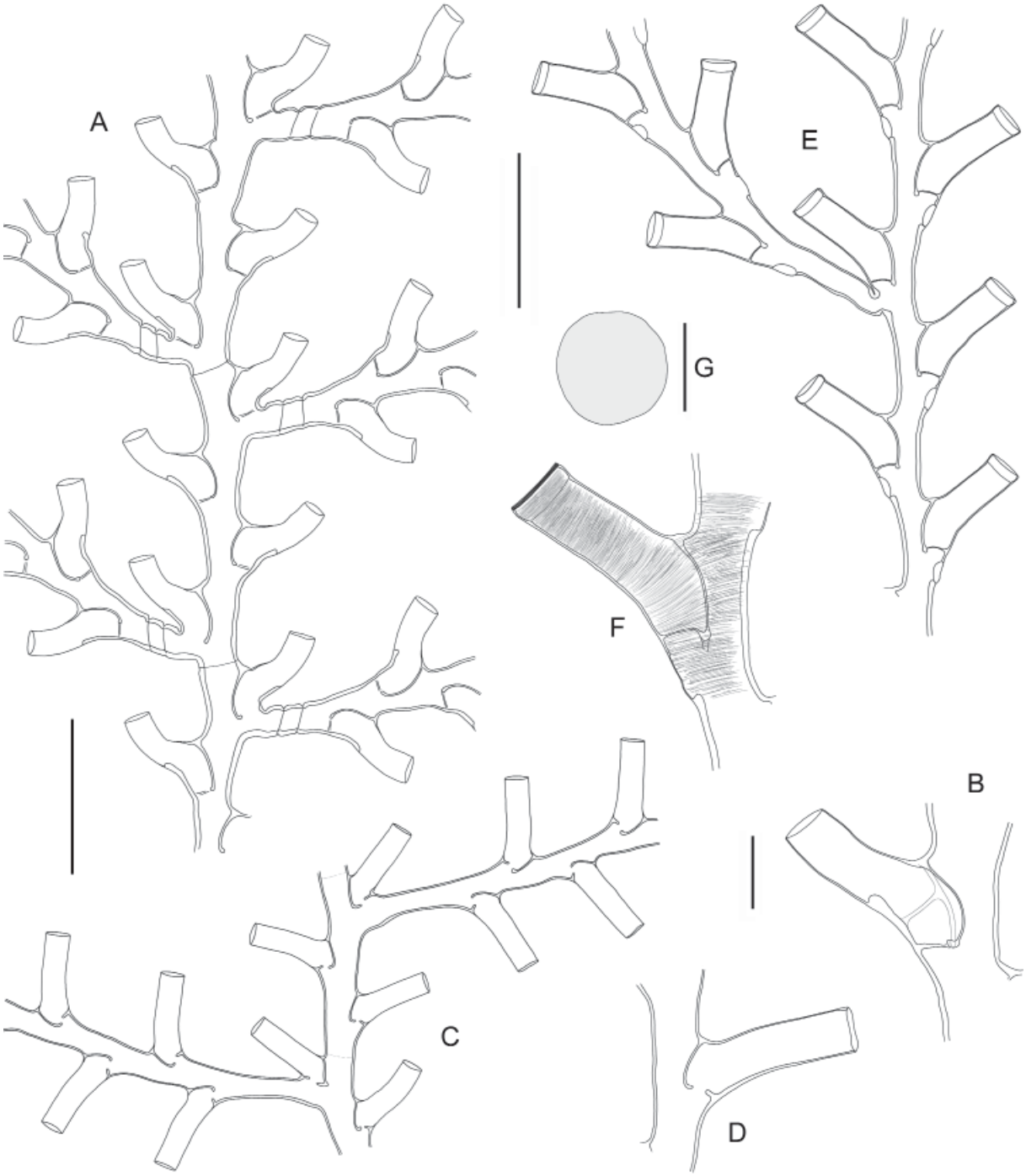

Fig. 4. — **A**–**B**. *Solenoscyphus candelabrum* gen. et sp. nov. **A**. Portion of stem with basal parts of five cladia. **B**. Hydrotheca, showing internal projections of the perisarc. — **C**–**D**. *Solenoscyphus decidualis* gen. et sp. nov. **C**. Portion of stem with basal parts of two consecutive cladia. **D**. Hydrotheca. — **E**–**G**. *Solenoscyphus striatus* gen. et sp. nov. **E**. Portion of stem with basal part of a side branch. **F**. Hydrotheca, showing the characteristic striation of the perisarc. **G**. Operculum. Scale bars: A, C, E = 2 mm; B, D, F = 500 µm; G = 300 µm.

Table 2. Measurements of species of *Solenoscyphus* gen. nov., in µm.

	***S. candelabrum* sp. nov.**	***S. deciduali*s sp. nov.**	***S. striatus* sp. nov.**
Stem			
"Internode" length	1085–1235	830–925	1170–1445
Diameter at "node"	445–580	390–440	360–430
Cladial apophysis length	385–445	–	–
Cladium			
"Internode" length	815–990	740–950	1170–1445
Diameter at "node"	445–580	220–340	360–430
First athecate internode	210–270	–	–
Hydrotheca			
Adaxial side free	610–780	975–1085	950–1075
Adaxial side adnate	610–730	335–395	590–655
Abaxial side	1085–1185	1000–1075	1335–1420
Maximum width	–	–	420–445
Base width	–	–	295–335
Diameter at rim	315–355	280–300	430–450

both possibly originally parts of a single colony with multiple stems. This colony obviously fascicled to an unknown extent, as largest available fragment comprises an accessory tube running up both main stem and basal part of lowest side branch. Division into internodes indistinct; each equivalent of internode relatively short, carrying a single hydrotheca on distal half. Branching pattern irregular and sparing, with up to second order side branches given off laterally from below bases of hydrothecae; side branches with same structure as stem; proximal-most internode comparatively longer than following ones. Hydrothecae biseriate and alternate; tubular in shape, adnate for slightly more than one-third of adaxial length, facing up- and outward; abaxial wall almost straight, except for proximal part, which is convex at point where hydrotheca becomes free on opposite side; free adaxial side straight and parallel to adaxial counterpart. Apical part of hydrotheca distinctly swollen and there perisarc much thinner than elsewhere; rim indistinctly tilted adaxially; rounded, thin operculum present in some hydrothecae; point of attachment indeterminable; deciduous. External perisarc finely and densely striated over entire colony. Gonothecae unknown; scar below one hydrotheca suggests at least one gonotheca was present and subsequently lost; numerous large foramina (obliterated by thin pellicle of perisarc) indicate that colony was about to become fertile.

Remarks

Although not resembling either *S. candelabrum* gen. et sp. nov. or S. *decidualis* gen. et sp. nov. in colony shape, the present species nevertheless possesses a deciduous operculum, which is one of the main features of the newly described genus.

Unlike *S. candelabrum* gen. et sp. nov., both *S. decidualis* gen. et sp. nov. and the present species possess long, tubular hydrothecae with straight axes. However, their adnate parts are longer and their apertures are wider in *S. striatus* gen. et sp. nov. Additionally, the entire perisarc of the latter is finely and densely striated.

Family Syntheciidae Marktanner-Turneretscher, 1890

Genus ***Hincksella*** Billard, 1918

Key to species

The following key comprises all species currently included in the genus *Hincksella*.

1. Colonies pinnate ……2
– Colonies with simple stems ……5

2. Hydrothecae shallow ……***H. sibogae*** Billard, 1918
– Hydrothecae deep ……3

3. Hydrotheca adnate for one-third ……***H. formosa*** (Fewkes, 1881)
– Hydrotheca adnate for half its length ……4

4. Free part facing outward ……***H. alternans*** (Allman, 1888)
– Free part facing upward ……***H. indiana*** Millard, 1967

5. Perisarc of hydrotheca finely and densely striated ……6
– Perisarc of hydrotheca smooth or wrinkled ……7

6. Hydrotheca making an almost right angle with the stem ……***H. similis*** sp. nov.
– Hydrotheca making an acute angle with the stem ……***H. neocaledonica*** sp. nov.

7. Perisarc of hydrotheca wrinkled ……***H. corrugata*** Millard, 1958
– Perisarc of hydrotheca smooth ……8

8. Hydrotheca exceedingly long ……***H. pusilla*** Ritchie, 1910
– Hydrotheca moderately long ……9

9. Aperture of hydrotheca facing outward ……***H. cornuta*** sp. nov.
– Aperture of hydrotheca facing upward ……10

10. Hydrotheca isodiametric throughout ……***H. projecta*** (Fraser, 1938)
– Margin of hydrotheca distinctly flaring ……***H. rigida*** (Fraser, 1938)

Hincksella cornuta sp. nov.

urn:lsid:zoobank.org:act:5DC46422-9914-47FF-8CE3-49AB51B0014A

Fig. 5A–D; Table 3

Diagnosis

Stems simple, monosiphonic, nodes indistinct; internodes relatively short, slightly geniculate, each carrying a hydrotheca; the latter alternate, tubular, bent in middle; rim often renovated; gonothecae arising from within the hydrothecae, broadly ovoid, lateral walls wrinkled; two prominent horns distally.

Etymology

From the Latin, *cornūtus*, meaning "horned", making reference to the prominent horns of the gonotheca.

Material examined

Holotype

NEW CALEDONIA: campaign Bathus 4, station DW923, 18°52' S, 163°24' E, 502–470 m, 6 Aug. 1994; whole stem 3.6 cm high, bearing two fully-formed gonothecae (IK-2012-10297).

Paratypes

NEW CALEDONIA: data as for holotype, four specimens (3.1 cm high fragment with no basal part, bearing two gonothecae; 3.3 cm high fragment devoid of its basal part; entire, 4.0 cm high stem with one gonotheca; entire, sterile stem 3.8 cm high) (IK-2012-10298).

Description

Stems erect, up to 3.8 cm high, unbranched and monosiphonic, arising from tubular hydrorhizae; basal constriction at origin from stolon; lower parts ahydrothecate and quite long (1.0–1.2 cm), occasionally with signs of breakage and subsequent regeneration; perisarc smooth. Division by nodes indistinct, but equivalents of internodes rather short, slightly geniculate, bearing single hydrothecae on distal halves. Hydrothecae alternate, although the two proximal-most ones may be given off on same side of stem;

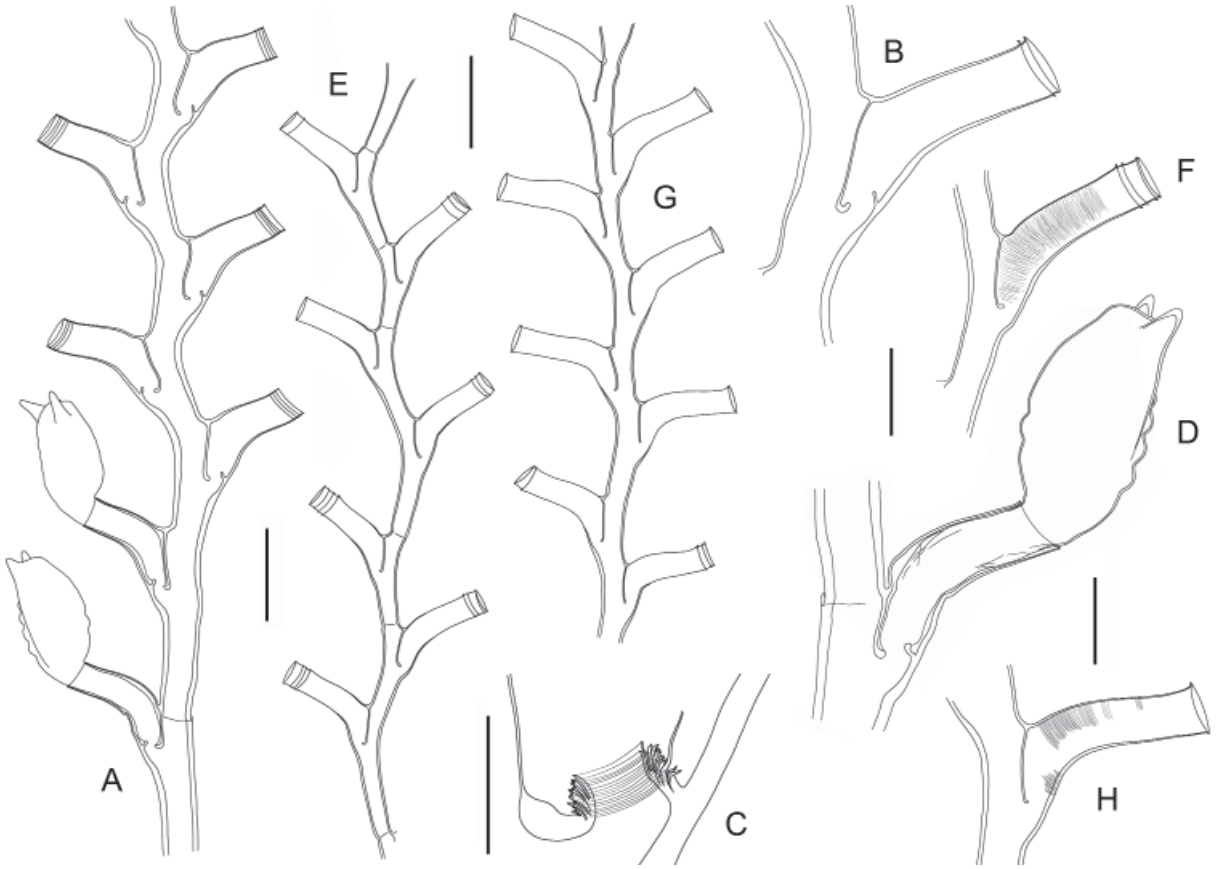

Fig. 5. — **A**–**D**. *Hincksella cornuta* sp. nov. **A**. Basal portion of stem with hydro- and gonothecae. **B**. Hydrotheca. **C**. Detail of the foramen for the passage of the hydranth into hydrotheca. **D**. Gonotheca arising from within a hydrotheca. — **E**–**F**. *Hincksella neocaledonica* sp. nov. **E**. Portion of stem. **F**. Hydrotheca, showing outer striations. — **G**–**H**. *Hincksella similis* sp. nov. **G**. Portion of stem. **H**. Hydrotheca, showing extent of external striations. Scale bars: A, E, G = 1 mm; B, D, F, H = 500 µm; C = 200 µm.

tubular, adnate for less than half of length; free part facing out- and upward; free adcauline wall slightly convex to almost straight; abcauline wall convex in middle and straight elsewhere; basal foramina with multiple renovations of perisarc (Fig. 5C); rim of hydrotheca often renovated; aperture circular, imperceptibly tilted adaxially. Hydranths enveloped by inner, thin, collapsible periderm, distinct from hydrothecal wall; tentacle number could not be counted. Gonothecae given off from within hydrothecae; broadly ovoid, with wrinkled perisarc, distally with two prominent horns; no signs of aperture; gonophore apparently single, large ovoid mass (oocyte?) occupying nearly entire lumen of gonotheca. Large macrobasic heteronemes (none seen discharged), with parallel walls and rounded ends, and with straight or slightly curved longitudinal axes, occur abundantly in coenosarc.

Remarks

The alternate, long, tubular, non-operculate hydrothecae, the gonothecae given off from within the hydrothecae, as well as the large macrobasic heteronemes (mastigophores?) scattered in the coenosarc place this species in the genus *Hincksella* Billard, 1918. The two horns on the distal part of its gonothecae distinguish this species from its congeners with known gonosomes, viz. *H. alternans* (Allman, 1888) (see original description), *H. formosa* (Fewkes, 1881) (see Galea 2013), *H. pusilla* Ritchie, 1910 (see Galea & Ferry 2015), and *H. sibogae* Billard, 1918 (see Vervoort & Watson 2003).

The remaining congeners with unknown gonothecae differ from *H. cornuta* sp. nov. in the following respects: 1) *H. corrugata* Millard, 1958 has comparatively shorter hydrothecae, adnate for as much as half their length, and their surface is transversely wrinkled (Millard 1958); 2) *H. indiana* Millard, 1967 is a much larger species, with fascicled stems, shorter hydrothecae, conspicuously tilted adaxially (Millard 1967); 3) the poorly described *H. projecta* (Fraser, 1938) appears to be different due to the lower length/width ratio of its hydrothecae, as well as on biogeographical grounds (Fraser 1938); 4) the hydrothecae of *H. rigida* (Fraser, 1938) are nearly as broad as deep and, according to Fraser (1938), they are comparatively shorter.

Hincksella neocaledonica sp. nov.
urn:lsid:zoobank.org:act:69FDB75D-8E59-4CFB-9387-35B0C1B1D65F
Fig. 5E–F; Table 3

Diagnosis

Stems simple, monosiphonic, divided into rather long internodes, each bearing a hydrotheca; the latter alternate, long, tubular, facing out- and upward; rim often renovated; surface of hydrotheca densely and finely striated.

Etymology

Named for its area of occurrence, New Caledonia.

Material examined

Holotype

NEW CALEDONIA: campaign Biocal, station DW46, 22°53’ S, 167°17’ E, 570–610 m, 30 Aug. 1985; 2.5 cm high, infertile stem devoid of hydrorhiza (IK-2012-10299).

Description

The 2.5 cm high stem fragment is devoid of its hydrorhiza and seems to have been broken off just above its origin from it. Monosiphonic throughout and unbranched; very basal part (*ca*. 2.5 mm long) ahydrothecate; remainder of stem divided into 21 moderately long, slender and geniculate internodes,

Table 3. Measurements of new species of *Hincksella* Billard, 1918, in µm.

	***H. cornuta* sp. nov.**	***H. neocaledonica* sp. nov.**	***H. similis* sp. nov.**
Stem			
"Internode" length	1160–1915	925–1420	665–1110
Diameter at "node"	310–370	150–215	185–290
Hydrotheca			
Adcauline side free	865–915	680–740	790–1000
Adcauline side adnate	590–730	395–420	465–490
Abcauline side	1135–1270	900–1010	1010–1235
Diameter at rim	345–370	275–300	290–320
Gonotheca			
Length	1245–1355 (w/o spines) 1395–1455 (w/ spines)	–	–
Maximum width	655–730	–	–
Cnidome			
Large capsules	(17.5–20.3) × (5.7–6.8)	(17.5–19.3) × (5.7–6.4)	(15.0–16.8) × (5.4–6.1)

by means of transverse nodes; perisarc of internodes smooth; a distally-placed hydrotheca per internode. Hydrothecae alternate, tubular, adnate for one-third of adcauline length, facing up- and outward, and oriented at an angle of *c*. 45° with internode; free adcauline wall nearly straight to imperceptibly convex; abcauline wall convex at inflexion point, then straight and parallel to its free adcauline counterpart; perisarc of hydrotheca finely and densely striated throughout; rim often renovated; aperture circular, perpendicular to long axis of hydrotheca. Gonotheca unknown. Large, parallel-walled macrobasic heteronemes (none seen discharged), with either straight or slightly curved axes and rounded ends, common in coenosarc.

Remarks

The alternate, long, tubular, non-operculate hydrothecae and the large nematocysts scattered in the coenosarc place this species, with little doubt, in the genus *Hincksella* Billard, 1918. It superficially resembles *H. pusilla* (Ritchie, 1910) (see Galea & Ferry 2015 for taxonomical considerations) through the shape of its internodes and hydrothecae. However, Ritchie's species is comparatively smaller (Galea 2010: table 3) and the perisarc of its hydrothecae is smooth throughout.

Hincksella similis sp. nov.
urn:lsid:zoobank.org:act:DBF94D6B-02BA-4364-B599-A411A95D8EC5
Fig. 5G–H; Table 3

Diagnosis

Stems simple, monosiphonic; nodes indistinct; each internode with a distal hydrotheca; the latter long, tubular, distinctly facing outward, finely and densely striated on free adcauline wall and lower part of abcauline wall.

Etymology

From the Latin *similis*, meaning "similar", on account of its resemblance to *H. pusilla* Ritchie, 1910.

Material examined

Holotype

NEW CALEDONIA: campaign Norfolk 1, station DW1722, 23°18' S, 168°10' E, 540 m, 26 Jun. 2001; sterile, 2.2 cm high stem (IK-2012-10300).

Description

Colony erect, 2.2 cm high, arising from creeping, tortuous, branching stolon. Stem monosiphonic, unbranched; basal part 9 mm long, ahydrothecate; remainder of stem divided by means of indistinct nodes; each equivalent of internode rather short, slightly geniculate to almost collinear, each bearing a hydrotheca distally. Hydrothecae tubular, given off at an angle of *c*. 65–70° with internode, long axis slightly sigmoid; abcauline wall markedly curved where hydrotheca becomes free; aperture rounded, rim even, slightly flared; renovations occasional; perisarc of hydrotheca finely and densely striated, especially on free adcauline side and proximal part of abcauline wall. Gonotheca unknown. Large macrobasic heteronemes (none seen discharged), with parallel walls and rounded ends, and with straight or slightly curved longitudinal axes, occur abundantly in coenosarc.

Remarks

The alternate, long, tubular, non-operculate hydrothecae and the large nematocysts scattered in the coenosarc place this species, with little doubt, in the genus *Hincksella* Billard, 1918. This species resembles both *H. pusilla* Ritchie, 1910, through the shape of its hydrothecae, and *H. neocaledonica* sp. nov. through their striations. However, the former is a much smaller species (see dimensions in Galea 2010: table 3), while the latter has comparatively longer and more geniculate internodes, its hydrothecae are given off at more acute angles, their free part is shorter, and the striations extend over the whole perisarc of the colony.

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