

## THE HYDROID AND MEDUSA OF *CORYMORPHA JANUARI* (CNIDARIA: HYDROZOA) IN TEMPERATE WATERS OF THE SOUTHWESTERN ATLANTIC OCEAN

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### ABSTRACT

During several surveys conducted in shallow, temperate waters of northern Patagonia, we found hydroids belonging to the family Corymorphidae. Additionally, sorting more than 2700 plankton samples yielded five specimens of a corymorphid medusa. Both stages belong to *Corymorpha januarii* Steenstrup, 1854, a hydrozoan rarely reported in the literature. This finding extends southwards its geographic distribution and represents the first Subantarctic record, as well as the first finding of the medusa stage in nature, confirming its endemism in the tropical and temperate waters of the Southwestern Atlantic.

Hydrozoans of the Argentinean continental shelf (~35–55 °S) have been intermittently studied since the end of the 19<sup>th</sup> century (see Genzano and Zamponi, 1997). Methodical studies with wide geographical and temporal coverage have been undertaken only very recently, with the newly obtained data enabling the complete update of species inventories concerning both the hydroids and their medusae (Genzano et al., 2008, 2009). However, as in any studied group, an inventory list can be enlarged by the finding of additional species which usually are difficult to collect. Cryptic habitats, fragility of the specimens, short life of the free swimming stage, sharp seasonality, and rarity are some of the factors that reduce the likelihood of finding either the sessile or the planktonic stages of some hydrozoan species.

The Corymorphidae (Hydrozoa, Anthomedusae) is an eloquent example of a rare species, since both the polyp and the medusa stage possess many of the above mentioned characteristics. The hydroid is solitary, fragile, and able to dig on soft bottoms, so the use of surface-operated benthic sampling methods is not conducive to its collection. In addition, the polyp has several cycles of senescence and regeneration, disappearing from benthic communities for prolonged periods (e.g., Bouillon et al., 2004). Similarly, the ephemeral planktonic life of medusae makes their capture very difficult thus intensive sampling efforts are needed to increase the probability of their collection.

During several SCUBA and trawl surveys conducted in shallow temperate waters of Northern Patagonia, we found several hydroids belonging to the family Corymorphidae. Additionally, we discovered a few corymorphid medusae while sorting several thousand plankton samples. Hydroid and medusa specimens were identified as *Corymorpha januarii* Steenstrup, 1854, a species previously known only from the subtropical waters off Southeast Brazil (Silveira and Migotto, 1992). Here we describe both the hydroid and medusa stages of this species, and discuss their geographical distribution along the Atlantic coast of South America.



Figure 1. Sampling stations where the specimens of *Corymorpha januarii* were found (• = hydroids, ★ = medusae). Arrows indicate previous records of Steentrup (1854) and Silveira and Migotto (1992).

## MATERIAL AND METHODS

### BENTHIC STAGE:

*Station 1.* Bahía Blanca estuarine zone, 39°07'S–61°50'W, Isaacs–Kidd Midwater Trawl, 11 m, 14 °C, and 32.5 ups, October, 1982: one adult (male) polyp and 1 immature hydranth.

*Station 2.* Punta Pardelas, Golfo Nuevo, Península Valdés, 42°37'S–64°15'W, SCUBA diving, 7 m, March, 2005: one immature, one female, and two male specimens.

*Station 3.* Puerto Madryn, 42°48'S–64°55'W, 5–10 m, April, 2008: two hydroids photographed in situ.

At all collecting sites, the bottom consisted of soft sediments, primarily sand with minor quantities of shells and mud.

### PLANKTONIC STAGE:

*Station 1.* 39°02'S–61°09'W, Pairovet plankton net (mesh-size 200 µm), 17 m, 15.0 °C, 33.7 ups, November 13, 2006: four specimens.

*Station 2.* 40°00'S–61°08'W, Pairovet plankton net (mesh-size 200 µm), 26 m, 15.0 °C, 33.7 ups, November 14, 2006: one specimen (Fig. 1).

Specimens were preserved in 5% formaldehyde solution and identified according to Silveira and Migotto (1992). The systematic classification given by Bouillon et al. (2004) was followed. The cnidome was identified following the nematocyst nomenclature proposed by Mariscal (1974) and Millard (1975). Material was deposited in the collections of the Departamento de Ciencias Marinas, Facultad de Ciencias Exactas y Naturales–Universidad Nacional de Mar del Plata (FCEyN–UNMdP) and the Invertebrates collection of the Museo Argentino de Ciencias Naturales (MACN-In).

## RESULTS

## SYSTEMATICS

Class Hydroidomedusae Clauss, 1877  
 Subclass Anthomedusae Haeckel, 1879  
 Order Capitata Khün, 1913  
 Suborder Tubulariidae Fleming, 1828  
 Family Corymorphidae Allman, 1872  
 Genus *Corymorpha* M. Sars, 1835  
*Corymorpha januarii* Steenstrup, 1854  
 (Figs. 2 and 3)

*Corymorpha januarii* Steenstrup, 1854; Silveira and Migotto, 1992.

*Corymorpha* sp. Migotto and Silveira, 1987.

*Hybocodon unicus*: Zamponi and Facal, 1987 [not *Hybocodon unicus* Browne, 1902].

*Description.*—**Benthic stage:** hydroid erect and solitary, with basal part embedded in soft bottom. Polyp with both hydranth and hydrocaulus of translucent white tinge. Hydrocaulus subcylindrical, with thin perisarc, and short sensory papillae at bulbous base; the latter provided with numerous long, anchoring filaments with ad-

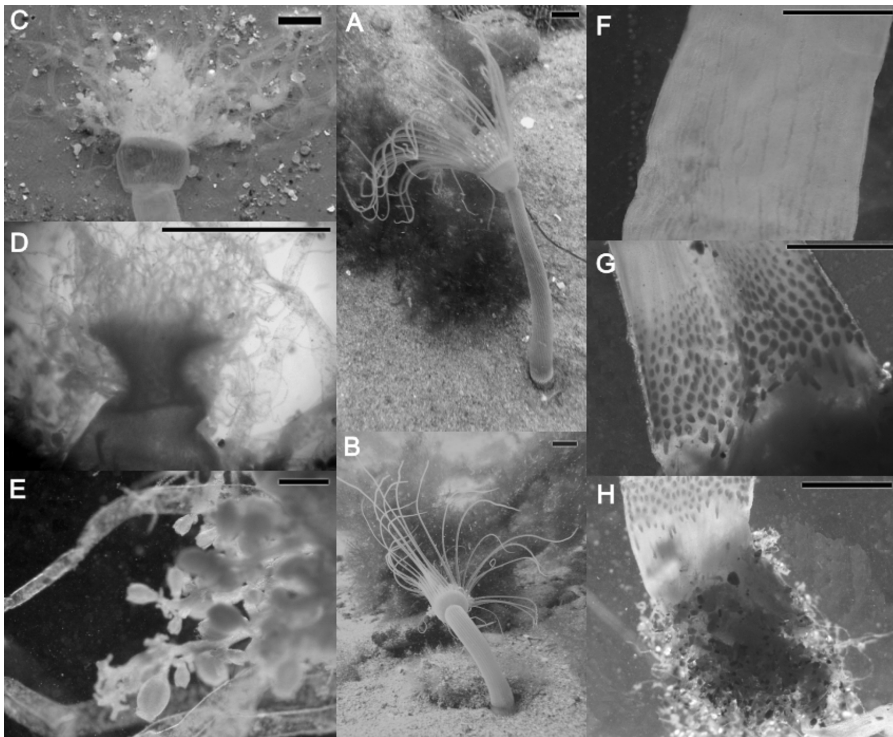


Figure 2. *Corymorpha januarii*: (A–B) photographs of living hydroid; (C) hydranth; (D) hypostome region showing oral tentacles; (E) aboral tentacles and blastostyles; (F) hydrocaulus with longitudinal endodermal canals; (G) sensory papillae; (H) anchoring filaments. Scale = 2.5 mm.

Table 1. Morphometric and morphological characters of *Corymorpha januarii*, polyp and medusa stages (n = number of analyzed specimens).

POLYP STAGE	Bahía Blanca		Península Valdés	
	Mean	Range	Mean	Range
	n = 2		n = 4	
Structures				
Hydrocaulus				
Diameter proximal (mm)	13	–	7.3	5–10
Diameter middle (mm)	6	–	4.75	4–6
Diameter distal (mm)	4	–	3.8	3.2–4
Length (mm)	73	–	39.3	26–53
N° of ectodermal ridges	28	–	28	24–34
Hydranths				
Diameter (mm)	10.5	9–12	5.5	4–8
Length (mm)	22	–	10.7	10–12
Aboral tentacles:				
Number	30	25–35	27.7	26–32
Average length (mm)	32	26–35	17.7	10–29
Cnidome	Stenoteles (8.4–10.7 × 9.6–13.3 μm), microbasic mastigophores (3.05–4.4 × 6.1–8.6 μm) and desmonemes (4.1–7.1 × 5.3–8.4 μm)			
Oral tentacles:				
Approximate number	260	–	170	150–190
Average length (mm)	4	3–6	4.3	3–6
Cnidome	Stenoteles (5.6–6.4 × 6.7–7.9 μm), microbasic mastigophores (very scarce, 4 × 5 μm) and desmonemes (2.8–3.8 × 4.3–5.7 μm).			
Blastostyle				
Number	40	–	13	12–14
Average length (mm)	18.2	10–27	8.9	4–12
FREE MATURE MEDUSA	n = 5			
Average height (mm)	1.0	0.8–1.2	–	–
Average diameter (mm)	0.9	0.7–1.0	–	–
Cnidome	Stenoteles (5.5–9.1 × 6.9–10.4 μm), desmonemes (1.1–1.5 × 5.3–8.4 μm) and small unidentified mastigophores (3.3–4.8 × 3.9–5.7 μm).			

hering silt, sand, and small bioclast (mollusk fragments). Hydrocaulus composed of parenchymatic endoderm, with numerous endodermal ridges (canals) running longitudinally from base to junction with hydranth. Hydranth distinctly demarcated from hydrocaulus; flask-shaped to vasiform, with numerous oral, filiform tentacles arranged in very closely-set whorls; aboral filiform tentacles comparatively longer and arranged in one whorl (Table 1, Fig. 2).

Blastostyles borne just above aboral tentacles; with short alternate branches, each up to fourth order branching, bearing gonophore buds in dense clusters. Gonophores reduced medusae; subspherical in shape, slightly higher than broader, with four equal, small tentacle bulbs. Manubrium cylindrical, usually as long as height of umbrella.

**Planktonic Stage:** Mature medusa provided with conspicuous, pointed apical process, and axial canal. Margin of umbrella perpendicular to its long axis; no exumbrellar nematocyst tracks. Four radial canals and one ring canal. Manubrium slightly shorter than umbrella, gonads completely surrounding manubrium (Table 1, Fig. 3).

## DISCUSSION

*Corymorpha januarii* has been found only twice since its original description. The first record occurred at Rio de Janeiro, Brazil (22°53'S–43°13'W) (Stentrup, 1854).

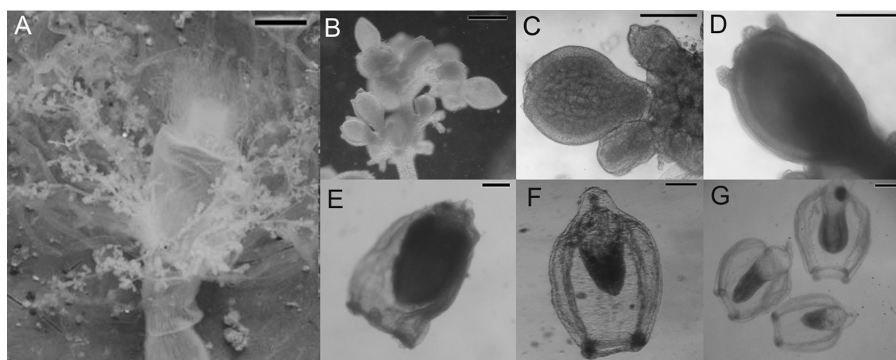


Figure 3. *Corymorpha januarii*: (A) hydranth with blastostyles; (B) detail of a blastostyles; (C–D) Gonophore; (E) mature gonophore just after release; (F–G) free-swimming medusae. Scale for A–B = 2.5 mm, C–D = 1 mm, and E–F–G = 250  $\mu$ m.

More than a century later, 25 hydroids were rediscovered along the south Brazilian coast at Santa Catarina ( $27^{\circ}26'–28^{\circ}36'S$  and  $48^{\circ}32'–48^{\circ}35'W$ ), a transitional zone between the tropical and temperate western South Atlantic (Migotto and Silveira, 1987; Silveira and Migotto, 1992). The specimens analyzed in this study agree with those described from Brazilian waters. In addition, a polyp reported by Zamponi and Facal (1987) in Bahía Blanca (Buenos Aires), which was misidentified as *Hybocodon unicus* (Browne, 1902) (Tubulariidae) was also reexamined and clearly identified as *C. januarii*.

The present, new finding from northern Patagonia, extends the geographical distribution of *C. januarii* far southward, and constitutes the first record of this species for the subantarctic region, in a transitional zone between the warm and cold temperate sector of the Argentinean continental shelf (Balech, 1954; Stuardo, 1964; Boschi, 2000, see also Fig. 1). It also represents the first finding of the medusa stage in nature. Since all of the records of *C. januarii* are from tropical and sub-temperate waters of the southwestern Atlantic Ocean, the species can be considered as endemic for this region.

The occurrence of *C. januarii* hydroids is rather sporadic; the fragility of its solitary polyps, which are able to dig on soft bottoms, makes it difficult to properly collect the species using standard benthic sampling methods. In addition, this species presents several cycles of senescence and regeneration (Silveira and Migotto, 1992) and presumably produces resting stages in its life cycle, similar to other *Corymorpha* species (Svoboda, 1973). Therefore, polyps belonging to Corymorphidae are able to disappear and reappear in benthos communities, contributing to its rare collection (e.g., Bouillon et al., 2004).

The genus *Corymorpha* includes species producing either free medusae or fixed gonophores (Schuchert, 1996; Bouillon and Boero, 2000; Svoboda and Stepanjants, 2000 and Bouillon et al., 2004). The gonophores of *C. januarii* are eumedusoids, abortive medusae with all marginal tentacles reduced and no mouth; consequently, they cannot feed (Millard, 1975). Eumedusoids are able to spawn gametes while attached to the polyp, dying soon after release (Silveira and Migotto, 1992; Genzano and Kubota, 2003). Therefore, their life span in nature is dramatically short and, in fact, the only previous description of *C. januarii* medusae was based on specimens released in aquaria (Silveira and Migotto, 1992). This ephemeral quality of *C. janu-*

*arii* medusae is evident here in that we found specimens in only two of more than 2700 samples.

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