ORIGINAL RESEARCH

Podocoryna tenuis (Hydrozoa) in temperate waters of the southwestern Atlantic: additional data on life cycle stages support its synonym with *Podocoryna humilis*

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ABSTRACT. Two species of Hydractiniidae (Hydrozoa) with metagenetic life cycle have been recorded for the temperate region of the southwestern Atlantic Ocean: the medusa stage of *Podocoryna tenuis* and the polyp stage of *P. humilis*. Both the adult medusa of *P. humilis* and the polyp stage of *P. tenuis* are unknown, but it is possible that they are different stages of the same species, a hypothesis still to be tested. Colonies of *P. humilis* growing on the southern king crab *Lithodes santolla* collected at the Atlantic Patagonian coast, and two small medusae released from these hydroid colonies were analyzed. Medusa of *P. humilis* were kept alive for 3 days and they were morphologically compared with the medusae of *P. tenuis* sorted out from ~ 2,500 plankton samples along the Atlantic Patagonian coast. The study of these specimens allowed reassessing the taxonomic status of *P. humilis* and *P. tenuis* from the southwestern Atlantic Ocean. Polyp and young medusa stages of *P. humilis* were described, and additional information was recovered to better describe the medusa stage of *P. tenuis*. New morphologic and biogeographic evidences in order to propose the synonymy between *P. tenuis* and *P. humilis* were discussed.

Key words: Hydroids, Hydromedusae, Hydractiniidae, Patagonia.

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Podocoryna tenuis* (Hydrozoa) en aguas templadas del Atlántico Sudoccidental: datos adicionales sobre las etapas del ciclo de vida respaldan su sinónimo con *Podocoryna humilis

RESUMEN. Se han registrado dos especies de Hydractiniidae (Hydrozoa) con ciclo de vida metagenético para la región templada del suroeste del Océano Atlántico: la etapa de medusa de *Podocoryna tenuis* y la etapa de pólipo de *P. humilis*. Tanto la medusa adulta de *P. humilis* como el estadio de pólipo de *P. tenuis* son desconocidos, pero es posible que se trate de diferentes estadios de una misma especie, hipótesis aún por contrastar. Se analizaron colonias de *P. humilis* que crecían sobre la centolla *Lithodes santolla* recolectadas en la costa atlántica de la Patagonia, y dos pequeñas medusas liberadas de estas colonias de hidroides. Las medusas de *P. humilis* se mantuvieron vivas durante 3 días y se compararon morfológicamente con las medusas de *P. tenuis* seleccionadas de ~ 2.500 muestras de plancton a lo largo de la costa atlántica patagónica. El estudio de estos especímenes nos permitió reevaluar el estado taxonómico de *P. humilis* y *P. tenuis* del Océano Atlántico Sudoccidental. Se describen las etapas de pólipo y medusa joven de *P. humilis*, y se recuperó información adicional para describir mejor la etapa de medusa de *P. tenuis*. Se discuten las nuevas evidencias morfológicas y biogeográficas para proponer la sinonimia entre *P. tenuis* y *P. humilis*.

Palabras clave: Hydroides, Hydromedusae, Hydractiniidae, Patagonia.

INTRODUCTION

Species of the Family Hydractiniidae L. Agassiz, 1862 (Cnidaria, Hydrozoa) are recorded worldwide on different substrates, such as algae, barnacles, rock, and even fishes, but they are usually found encrusting gastropod shells which can be occupied by hermit crabs (Miglietta and Cunningham 2012).

The metagenetic life cycle, involving planula, benthic asexual polyp, and swimming sexual medusa, occurs in some species (Bouillon et al. 2006), but many hydractiniid species have different stages of reduction of the swimming medusa, either to ephemeral medusoids or to sporosacs (Miglietta and Cunningham 2012).

The most speciose genera of Hydractiniidae, *viz.*, *Hydractinia* van Beneden 1844, *Podocoryna* M. Sars 1846, and *Stylactis* Allman, 1864, have been historically distinguished by a few characters, such as expression of the sexual stage (i.e. medusa/medusoid/gonophore) and morphology of the hydrorhiza (e.g. reticular or encrusting mat with or without perisarc, and chitinous or calcareous spines) (Schuchert 2008). These characters, however, are plastic and have intergrading morphologies among species and genera (Calder 1988; Bouillon et al. 1997), being either incongruent (e.g. hydrorhizal morphology) or partially congruent with phylogenetic patterns (Miglietta and Cunningham 2012). The scarcity of knowledge on many life cycle strategies of hydractiniids also collaborates to make its taxonomy poorly understood.

Three species of Hydractiniidae have been recorded for the temperate region of the southwestern Atlantic Ocean: *Hydractinia parvispina* Hartlaub, 1905, *Podocoryna humilis* (Hartlaub, 1905) and *Podocoryna tenuis* (Browne, 1902) (see synthesis in Oliveira et al. 2016). Browne (1902) described *Dysmorphosa tenuis*, currently accepted as *Podocoryna tenuis*, based on two medusae from Malvinas Islands, and this species was subsequently also reported for the southern Patagonian coast (Genzano et al. 2008). Hartlaub (1905) described two hydractiniid species from Tierra del Fuego based on the polyp stage: *Hydractinia parvispina* (with sporosacs) and *P. humilis* (with medusa buds), the latter originally described in the Genus *Podocoryne* Luetken, 1850. Both the adult medusa of *P. humilis* and the polyp stage of *P. tenuis* are unknown. Hartlaub (1905) was the first author to suggest that *P. humilis* could be the polyp stage of *P. tenuis*, a hypothesis still in need to be tested (Galea 2007).

We came across with colonies assignable to *P. humilis* growing on the southern king crab *Lithodes santolla* (Molina, 1782) from the Patagonian coast. Some colonies were kept in aquarium and released two small medusae that were kept alive for 3 days. This material was compared with medusae of *P. tenuis* from the Atlantic Patagonian coast. Morphological and morphometric analyses of *P. humilis* and *P. tenuis* allowed us to reassess the taxonomic status of these two hydractiniid species for the southwestern Atlantic Ocean. Here, the polyp and the young medusa stages of *P. humilis* were described, and descriptions of the medusa stage of *P. tenui*s were complemented. We aimed to provide additional data and new arguments to support the synonymy of *P. tenuis* and *P. humilis*.

MATERIAL AND METHODS

Three specimens of king crab *Lithodes santolla* with epizoic hydractiniid colonies were collected in October 2014, January 2015 and February 2016, respectively, at 35-40 m depth along the southern zone of San Jorge Gulf, Comodoro Rivadavia, Argentina (~ 45.87° S-66.38° W) (Figure 1). Samples were fixed in 5% formaldehyde solution diluted in seawater and transferred to 96-100% ethanol (FCEyN-UNMdP Hd 9-80; Hd 11-115; MZUSP 3411, 3412, 3413, 3414).

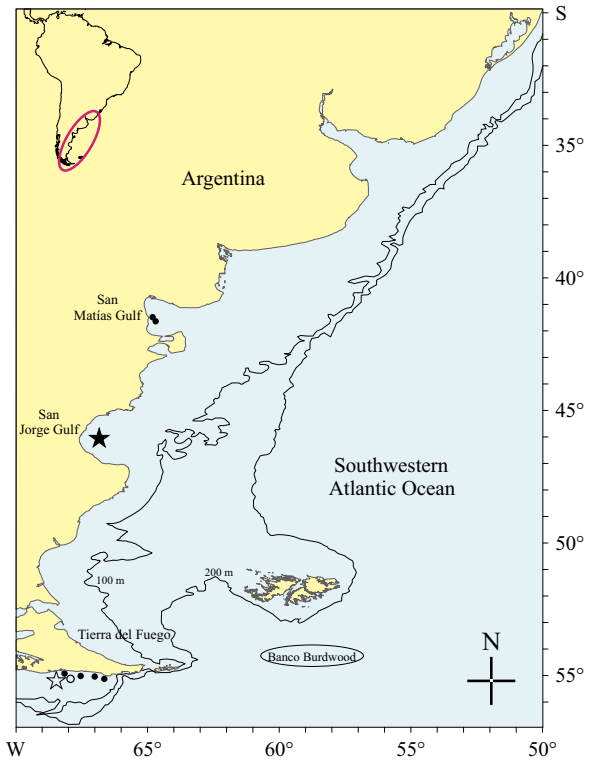

Figure 1. Sampling locations of *Podocoryna tenuis* along the Atlantic Patagonian coast. Encircled black dots indicate stations where medusae were collected by plankton tows. Star indicates the location where the southern king crab *Lithodes santolla* where collected with the epizoic Hydractiniidae colonies. Empty star indicates the location where a tractor crab *Peltarion spinulosum* with epizoic colonies was photographed.

One epizoic colony from San Jorge Gulf was observed *in vivo* in November 2006 and two medusae were released and kept alive for 3 days, being subsequently preserved in 5% formaldehyde. This material was compared with *P. tenuis* medusae collected in December 1996 (N = 1) and December 2006 (N = 1) at 54.91° S-55.10° S and 66.50° W-68.20° W (FCEyN-UNMdP Hm 11-6, Hm 11-7), respectively, using Pairovet plankton net (mesh size 200 µm), and at 41.33° S-41.48° S, 64.83° W-64.91° W (N = 1) (FCEyN-UNMdP Hm 11-8), using Bongo plankton net (mesh size 300 µm). All planktonic samples were fixed in 5% formaldehyde solution.

Photos in aquarium of one colony growing on red king crab *L. santolla* and one medusa released from it (August 2020), and also photos in nature of two colonies attached to two tractor crabs *Peltarion spinulosum* (White, 1843), both from Beagle Channel, Tierra del Fuego (54° 48′ S-68° 18′ W) provided additional information.

All specimens were morphologically and morphometrically analyzed under stereo and compound light microscope. Specimens were identified to the species level based on specific literature (e.g. Hartlaub 1905; Browne and Kramp 1939; Kramp 1952; Schuchert 2001, 2008; Galea 2007). The current classification for the genera of Hydractiniidae (Miglietta and Cunningham 2012) was adopted. Cnidome was identified according to Mariscal (1974) and Millard (1975). Specimens are deposited in the Invertebrate Collection of the Departamento de Ciencias Marinas, Facultad de Ciencias Exactas y Naturales, Universidad Nacional de Mar del Plata (FCEyN-UNMdP), and in the Collection of Marine Invertebrates of the Museu de Zoologia, Universidade de São Paulo (MZUSP).

RESULTS

Polyp stage

Material examined

Two colonies on two individuals of *L. santolla*, San Jorge Gulf, 45.87° S-66.38° W, 35-40 m depth, October 2014, formaldehyde 5%; one colony on one individual of *L. santolla*, 45.87° S-66.38° W, 35-40 m depth, January 2015, ethanol 96%; two colonies on two individuals of *L. santolla*, 45.87° S-66.38° W, 35-40 m depth, February 2016, formaldehyde 5% and ethanol 96%.

Description

Colonies grouped on inferior and superior carapace, chelae and walking legs of *L. santolla* (Fig-

ure 2 A and 2 B). Hydrorhiza creeping and stolonal, without calcareous spines. Polyps without calcareous skeleton, polymorphic (gastrozooids and gonozooids) arising directly from hydrorhiza. Gastrozooids club-shaped, 2.9-4.3 mm high, 0.2-0.5 mm wide (n = 30); hypostome dome-shaped, with one whorl of 5-15 filiform tentacles (Figure 3 A and 3 B). Gonozooids 4.4-5.5 mm high, 0.2-0.4 mm wide (n = 30); gonophores branched producing free medusae, arranged in clusters of 3-32 globular to oblong medusa buds, arising along the distal half of gonozooid (Figure 3 C-F); medusa buds 0.22-0.49 mm high, 0.19-0.35 mm wide, with 4 radial canals and 4 tentacular bulbs; some individuals with 4 tentacles and manubrium as ovoid mass without mouth (Figure 2 C and 2 D). Nematocysts microbasic mastigophores, length 7-9 µm, width 2-3 µm.

Remarks

Polyps stage are similar to *Podocoryna humilis* Hartlaub, 1905, except for the presence of spines on hydrorhiza (absent in our preserved material). This character, however, seems to be variable, since small spines were observed in colonies growing on one specimen (not preserved) of *L. santolla* from Tierra del Fuego (see discussion below).

Young medusa stage

Material examined

Two medusae released from colonies growing on one king crab *L. santolla*, November 2006, 45.87° S-66.38° W, and kept alive in aquarium for 3 days, being subsequently preserved in 5% formaldehyde.

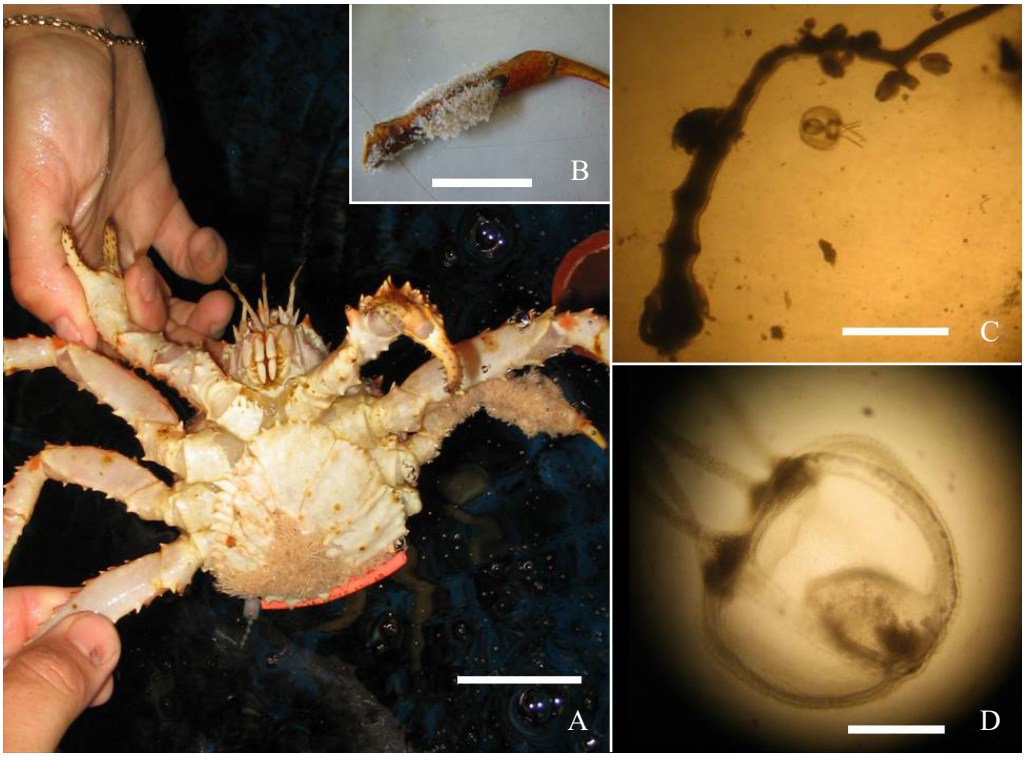

Figure 2. *Lithodes santolla* with epizoic colonies of *Podocoryna tenuis*. A) Southern king crab with colonies on the ventral carapace and on the left walking leg. B) Detail of the walking leg with colonies of *P. tenuis*. C) Colony of *P. tenuis* with a recent released medusa. D) Detail of the recent released medusa of *P. tenuis*. Scales: a and b: 3 cm; c: 500 µm; d: 100 µm.

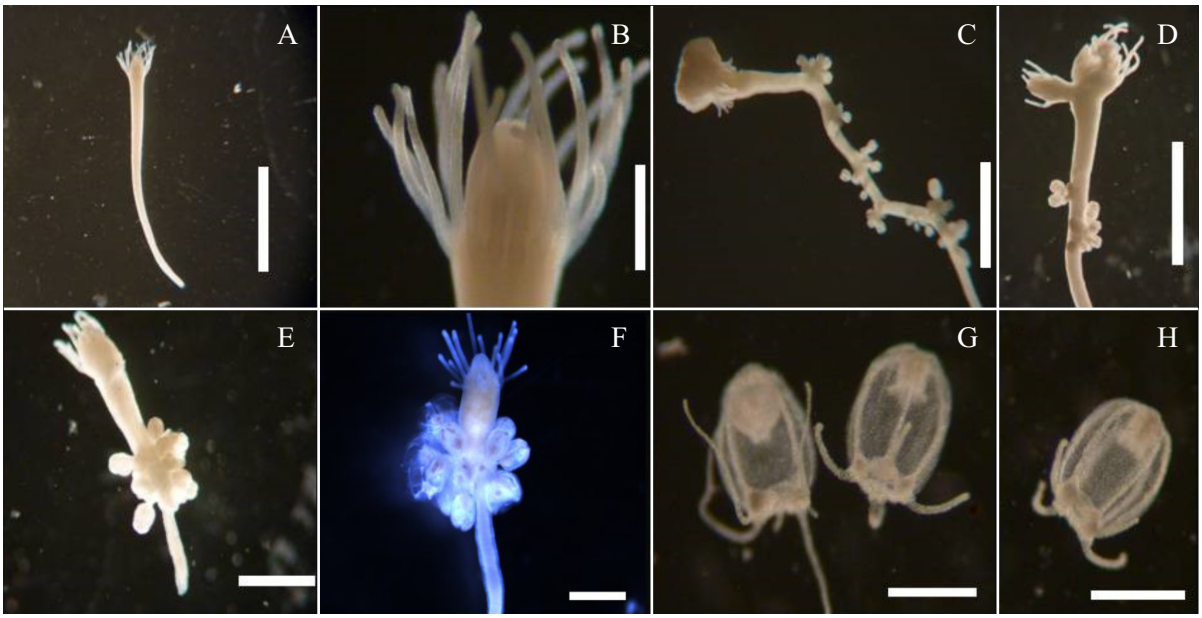

Figure 3. Preserved material of medusa and polyp stages of *Podocoryna tenuis* collected from San Jorge Gulf. A) Gastrozooid. B) Oral region of the gastrozooid. C and D) Gonozooids. E and F). Detail of medusa buds. G and H) Two days old medusae. Scales: a, c-f: 1 mm; b: 200 µm; g and h: 500 µm.

Description

Newly-released medusa measuring 0.3 mm in diameter, 0.4 mm height, 4 large perradial marginal bulbs with tentacles; interradial bulbs absent; manubrium simple, cubical. Three-days old medusae with 0.5-0.6 mm in diameter, 0,7 mm height, 4 perradial tentacles, 2-4 interradial shorter tentacles, inconspicuous interradial tentacular bulbs, manubrium extending up to the half of the subumbrellar height, with small terminal clusters of cnidocysts; gonads absent (Figure 3 G and 3 H).

Remarks

The young medusae resembles *Hydractinia tenuis* (Browne, 1902). Browne and Kramp (1939) described for this region juveniles of *H. tenuis* morphologically similar to analyzed specimens, having mouth with four lips and terminal clusters of nematocyst, eight marginal tentacles and absence of medusa buds upon the stomach, in specimens smaller than 1 mm.

Medusa stage

Material examined

One medusa, 54.91° S-66.50° W, December 1996, formaldehyde 5%; one medusa, 55.10° S-68.20° W, December 1996, formaldehyde 5%; one medusa, 41.33° S-64.52° W, December, 2006, formaldehyde 5%.

Description

Medusa collected from water column were 0.65-1.30 mm high, slightly wider than tall (width 0.75-1.50 mm), with gastric peduncle; manubrium extends up to 2/3 of subumbrellar height, cubical, with 4 perradial short simple lips; terminal cluster of cnidocysts at the end of each lip; specimens from San Matias Gulf with short and slightly branched lips. Four broad radial canals, 8 tentacles, perradial and interradial bulbs without ocelli. Gonads not developed. Two specimens with 0.10-0.15 mm high medusae buds on the manubrium, in different developmental stages (Figure 4 A-D).

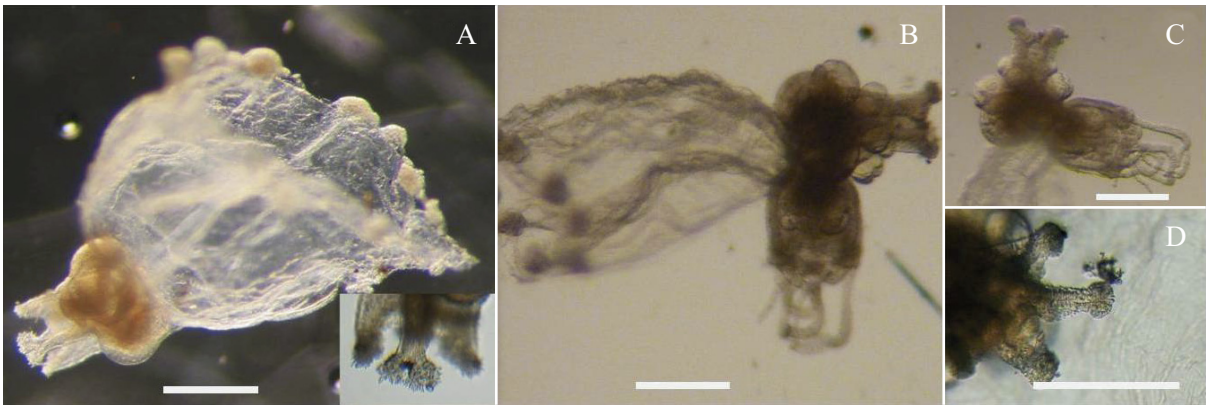

Figure 4. Preserved material of adult medusa stage of *Podocoryna tenuis* collected from San Matías Gulf and detail of slightly branched lips (A). Specimen from Tierra del Fuego with medusa bud on the manubrium (B and C) and detail lips with terminal cluster of cnidocyts (D). Scales: a: 200 µm; b-d: 100 µm.

Remarks

Morphological characters and measurement of medusa specimens analyzed in this study corresponded to the description of *H. tenuis* (Browne, 1902). In addition, the presence of medusa buds upon the stomach, interradially situated, agree with those described for this species.

Taxonomy

Polyps and medusa stages of *Podocoryna /Hydractinia* from temperate waters of southwestern Atlantic were separately described almost one century ago. Considering the morphological similitudes found between the analyzed material and that early description of both stages and, additional data on life cycle phases the following synonyms is adopted.

Class Hydrozoa Owen, 1843
Subclass Hydroidolina Collins, 2000
Superorder Anthoathecata Cornelius, 1992
–non-monophyletic
Order Filifera Kühn, 1913 –non-monophyletic
Family Hydractiniidae L. Agassiz, 1862
Genus *Podocoryna* M. Sars, 1846
Podocoryna tenuis (Browne, 1902)
Figures 2-5

Dysmorphosa tenuis Browne, 1902 p. 277 [medusa].

Podocoryne humilis Hartlaub, 1905 p. 523-524; Genzano and Zamponi 1997 p. 289 [polyp].

Podocoryne tenuis—Mayer 1910b p. 141; Browne and Kramp 1939 p. 280-281, pl. 15 fig. 5-6; Kramp 1959 p. 102 fig. 70; Kramp 1961 p. 70 [medusa].

Podocoryna carnea var. *chilensis* Kramp, 1952 p. 4-6, figs 1-2 [polyp and medusa] [non *Podocoryna carnea* M. Sars, 1846].

Podocoryne carnea—Segura-Puertas 1984 p. 26, pl. 4, fig. 1 [medusa] [non *Podocoryna carnea* M. Sars, 1846].

Hydractinia tenuis—Galea 2007 p. 25, pl. 1H, fig. 6L; Palma et al. 2011 p. 263, 269; Genzano *et al.* 2008 p. 8; Villenas et al. 2009 p. 313, 318, 321-322.

Podocoryne minuta—Pagès and Orejas 1999 p. 53, 56 [medusa] [non *Dysmorphosa* (*Hydractinia*) *minuta* Mayer, 1900].

Hydractinia minuta—Tronolone 2001 p. 60-62, fig. 14a-c; Migotto et al. 2002 p. 12; Palma et al. 2007a p. 74, 78, 81, 2007b p. 69-71, 73-74; Villenas et al. 2009 p. 318; Bravo et al. 2011 p. [medusa].

DISCUSSION

Morphological characters of Patagonian medusae herein studied corresponded to the description of *P. tenuis*, a species originally recorded for Malvinas Islands and commonly found in South American waters (Oliveira et al. 2016, for a review). Patagonian polyps, however, are morphologically similar to *P. humilis* originally recorded for Tierra del Fuego. Curiously, since its original description, Hartlaub (1905) already hypothesized that his species could be the polyp stage of *P. tenuis*. Posteriorly, Mayer (1910) also considered this idea, but it could be inferred that the lack of newly released medusae has prevented him to assume the synonymy.

Podocoryna carnea (M. Sars, 1846) is a well-known northern hemisphere species, also accounting with doubtful records at the southern hemisphere (Edwards 1972; Schuchert 2008). South American specimens assigned to *P. carnea* were described from Chile (Kramp 1952, colonies and newly released medusae for Puerto Montt) and Peru (Segura-Puertas 1984, one medusa only). Immature medusae described cannot be conclusively assigned to *P. carnea*. Colonies described for Chile also have taxonomical uncertainties. They were doubtfully described as *P. carnea* var. *chilensis* by Kramp (1952), but they differ from north European *P. carnea* by lacking spines, spiral zooids or tentaculozooids (Schuchert 2001). These characters, however, are considered variable, e.g. spines have variable density and would be often absent depending on the host and habitat inhabited by the colony (Edwards 1972; Calder 1988; Schuchert 2008). Additionally, spiral zooids or tentaculozooids are only present in epizoic colonies on hermit crabs (Schuchert 2008).

On the other hand, Chilean and Peruvian immature medusa assigned to *P. carnea* are similar to the Patagonian material we have studied, differing only by the timing of appearance of interradial bulbs (Kramp 1952; Segura-Puertas 1984). Chilean colonies are especially similar to Patagonian ones in the lack of spines, spiral and tentaculozooids, differing only by slightly smaller dimensions and number of gastrozooid tentacles. Both of these morphological characters, however, are highly variable for species differentiation.

Seventeen species assigned to Hydractiniidae were so far recorded for the South American coast, either with the medusa stage or with fixed gonophores: 10 of them are exclusively distributed along the Pacific side, 4 are exclusive on the Atlantic side, and 3 are distributed along both oceans of South American coast (Oliveira et al. 2016). Except for *P. carnea* (already discussed above), we focused our comparisons among the six species with free-swimming medusa stages (i.e. *Podocoryna* spp.) in order to clarify their morphological differences in relation to *P. tenuis* (and also *P. humilis*) (Table 1).

Three species of *Podocoryna* have only the medusa stage recorded for South America: *Podocoryna apicata* (Kramp, 1959), *Podocoryna areolata* (Alder, 1862) and *Podocoryna borealis* (Mayer, 1900) (Table 1). The medusa stage of *P. apicata* differs from *P. tenuis* by the apical process and thick mesoglea (Segura-Puertas 1984). *P. areolata* and *P. borealis* have the medusa stage described for elsewhere (Edwards 1972; Schuchert 2001, 2008). The main differences between *P. areolata* and *P. tenuis* medusae are related with the thickening of the mesoglea at the apex, the high number of tentacles (~ 40 to 56) and the spanning of the manubrium at *ca*. 1/2 of the subumbrella height (Schuchert 2008). Colonies of *P. borealis* have the polyp stage also described for elsewhere, differing from *P. tenuis* by the presence of spines and tentaculozooids (Edwards 1972; Schuchert 2001). The young medusa stage of *P. borealis* is larger (~ 0.8 mm) than *P. tenuis* and has 6-8 tentacles (Schuchert 2001).

Table 1. Species of Hydractiniidae recorded for the South American coast. Data of *Podocoryna tenuis* reported in this study. P = polyp; M = medusa; FS = fixed gonophores.

Species	Recorded stage	Reproductive stage	Atlantic	Pacific	References
Hydractinia echinata (Fleming, 1828)	P	FS	+		Wedler (1975), Oliveira et al. (2016)
Hydractinia hancocki Fraser, 1938	P	FS		+	Fraser (1938a); Calder et al. (2003); Oliveira et al. (2016)
Hydractinia longispina Fraser, 1938	P	FS		+	Fraser (1938a, 1938b, 1939, 1948); Calder et al. (2003); Oliveira et al. (2016)
Hydractinia multispina Fraser, 1938	P	FS		+	Fraser (1938a, 1938b, 1948); Calder et al. (2003); Oliveira et al. (2016)
Hydractinia pacifica Hartlaub, 1905	P	FS		+	Hatlaub (1905); Galea (2007); Galea et al. (2007, 2009); Galea and Schories (2012)
Hydractinia parvispina Hartlaub, 1905	P	FS	+	+	Hartlaub (1905); Jäderholm (1905, 1917); Blanco (1994); Genzano and Zamponi (1997); Oliveira et al. (2016)
Hydractinia polycarpa Fraser, 1938	P	FS		+	Fraser (1938a, 1948); Oliveira et al. (2016)
Hydractinia rugosa Fraser, 1938	P	FS		+	Fraser (1938b, 1948)
Podocoryna apicata (Kramp, 1959)	M	M		+	Segura-Puertas (1984); Oliveira et al. (2016)
Podocoryna areolata (Alder, 1862)	M	M	+		Guerrero et al. (2013); Oliveira et al. (2016)
Podocoryna borealis (Mayer, 1900)	M	M		+	Pagès and Orejas (1999); Galea (2007); Galea et al. (2007); Palma et al. (2007a, 2007b, 2011); Villenas et al. (2009); Bravo et al. (2011); Oliveira et al. (2016)
Podocoryna carnea (M. Sars, 1846)	P, M	M		+	Kramp (1952); Segura-Puertas (1984); Oliveira et al. (2016)
Podocoryna humilis (Hartlaub, 1905)	P, M(?)	M	+	+	Hartlaub (1905); Blanco (1994); Genzano and Zamponi (1997); Oliveira et al. (2016)
Podocoryna loyola Haddad, Bettim and Miglietta, 2014	P, M	M	+		Correia (1983); Bettim and Haddad (2013); Haddad et al. (2014); Nogueira Jr et al. (2015); Oliveira et al. (2016)
Podocoryna quitus Miranda and Marques, 2016	P, M(?)	M		+	Fraser (1938a, 1948); Oliveira et al. (2016)

Table 1. Continued.

Species	Recorded stage	Reproductive stage	Atlantic	Pacific	References
Podocoryna tenuis Hartlaub, 1905	P, M	M	+	+	Browne (1902); Browne and Kramp (1939); Hartlaub (1905); Kramp (1952); Segura-Puertas (1984); Blanco (1994); Genzano and Zamponi (1997); Pagès and Orejas (1999); Tronolone (2001); Migotto et al. (2002); Galea (2007); Genzano et al. (2008); Villenas et al. (2009); Bravo et al. (2011); Silveira and Morandini (2011); Oliveira et al. (2016)
Podocoryna uniformis (Stampar, Tronolone and Morandini, 2006)	P, M	M	+		Stampar et al. (2006b); Miranda et al. (2015); Oliveira et al. (2016)

The other three South American *Podocoryna* species, i.e. *P. loyola*, *P. quitus*, and *P. uniformis*, have both polyp and medusa stages recorded for the region (Table 1), although only medusa buds were observed for *P. quitus* (Fraser 1938a, p. 24-25, fig. 23C). All of them are also clearly different from *P. tenuis and P. humilis*. Colonies of *P. loyola* have tentaculozooids, newly-liberated medusae with eight tentacular bulbs, eight tentacles, and small interradial gonads (Haddad et al. 2014). Colonies of *P. quitus* have very small gastrozooids (up to 0.7 mm) and medusa buds arising right below tentacles, and occasionally, directly from the stolon (Fraser 1938b). Colonies of *P. uniformis* have monomorphic polyps with nipple-shaped hypostome and red ocelli in marginal bulbs of newly-released medusa (Stampar et al. 2006).

Many hydroids are generalists in the use of substrata, with specializations rarely observed in a few taxa (Campos et al. 2012; Miglietta and Cunningham 2012). Species of the Family Hydractiniidae usually grow on mollusk shells, especially those inhabiting hermit crabs, but they also occur on other moving and non-moving substrata (Schuchert 2008; Miglietta et al. 2009). Colonies of *P. tenuis* were previously recorded on gastropods (Hartlaub 1905), and herein recorded on the southern red crab *L. santolla* but also on carapace, chelae and walking legs of tractor crab, *P. spinulosum* (Figure 5). The inconspicuousness of colonies may be one of the reasons for the few data of these organisms, making them incorrectly interpreted as rare species.

Specimens of *Podocoryna* herein studied suggest that polyps of *P. humilis* and medusae of *P. tenuis* are the same species. Historical biogeographic records of both *P. humilis* (Hartlaub 1905) and *P. tenuis* (Browne 1902) exclusively along the South America coast reinforce this. Furthermore, the lack of additional records of *P. humilis* for more than one century of marine research along the South American coast is another putative evidence that Hartlaub's specimens might refer to *P. tenuis* (Browne 1902). We are aware, however, that molecular techniques are fundamental to help clarifying this taxonomic question in the near future, including the phylogenetic position of these species in the Family Hydractiniidae.

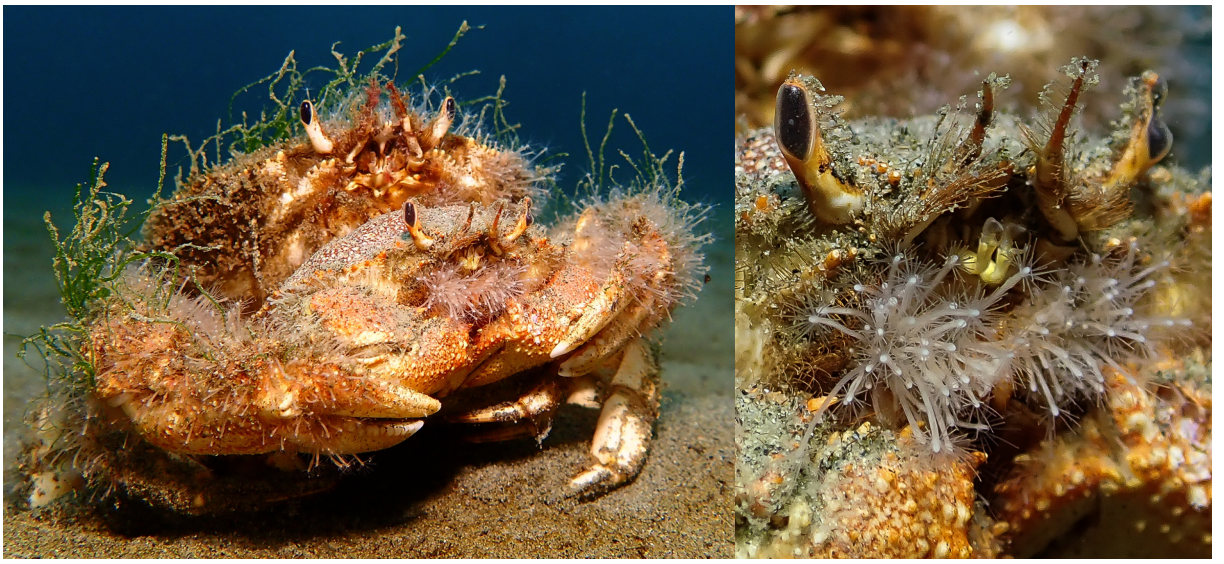

Figure 5. Tractor crabs *Peltarion spinulosum* with detail of epizoic colonies.

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Author contributions

Gabriel N. Genzano: investigation, conceptualization, funding acquisition, formal analysis, methodology, writing-original draft, writing-review and editing. Thaís P. Miranda: conceptualization, supervision, writing-review and editing. Nuria Vázquez: data curation. Resources-provision of study materials. Julieta Jañez: data curation, resources-provision of study materials. Antonio C. Marques: funding acquisition, writing-review and editing.

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