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Reassessment of the diversity of the brown algal genus *Colpomenia* (Endlicher) Derbès & Solier (Scytosiphonaceae, Ectocarpales) in Argentina based on mitochondrial *cox3* gene, including the description of *Colpomenia patagonica* sp. nov.

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Reassessment of the diversity of the brown algal genus *Colpomenia* (Endlicher) Derbès & Solier (Scytosiphonaceae, Ectocarpales) in Argentina based on mitochondrial *cox3* gene, including the description of *Colpomenia patagonica* sp. nov.

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ABSTRACT
Recent molecular phylogenetic studies of members of the brown algal family Scytosiphonaceae Ardissone & Strafforello collected on the coast of Argentina revealed taxonomic misidentifications and hidden biodiversity, resulting in new additions to the seaweed flora of the southwestern Atlantic Ocean. In this work, we reassessed the taxonomy of the scytosiphonacean genus *Colpomenia* (Endlicher) Derbès & Solier from Patagonian Argentina by integrating mitochondrial *cox3* gene information with morpho-anatomical observations. We show here that specimens from Argentina were recovered in two major clades assigned to *Colpomenia peregrina* Sauvageau and *Colpomenia claytoniae* S.M.Boo *et al.*, constituting the first report of these species in the southwestern Atlantic Ocean. Within the large *C. claytoniae* clade, specimens were recovered in two distinct lineages with sequence divergences of 2.72-4.09%, suggesting the occurrence of cryptic diversity. One of these lineages (Lineage 1) has Indo-Pacific Ocean distribution and includes the type specimen of *C. claytoniae* from South Korea, while the other lineage (Lineage 2) has Atlantic-Pacific Ocean distribution. The Argentinian representatives of Lineage 2 had a saccate and convoluted thallus up to 6.5 cm, four layers of medullary cells, extensive and confluent plurangial sori formed by plurangia and uni or bicellular paraphyses. Considering these, we here describe the new species *Colpomenia patagonica* M.E. Croce & Santiañez, sp. nov. Our work added three *Colpomenia* species to the known marine benthic flora of Argentina, increased the number of seaweeds reported in Patagonia, and contributed new knowledge on the diversity and distribution of species in the Scytosiphonaceae.

KEY WORDS
Atlantic Ocean, *Colpomenia* claytoniae, cryptic diversity, Patagonia, Phaeophyceae, Scytosiphonaceae, new species.

RÉSUMÉ
Réévaluation de la diversité du genre d'algues brunes Colpomenia *(Endlicher) Derbès & Solier (Scytosiphonaceae, Ectocarpales) en Argentine basée sur le gène mitochondrial* cox3*, incluant la description de* Colpomenia patagonica *M.E. Croce & Santiañez, sp. nov.*
Les récentes études phylogénétiques moléculaires des membres de la famille des algues brunes Scytosiphonaceae Ardissone & Strafforello (1877) récoltées le long de la côte argentine ont révélé des identifications erronées et une biodiversité cachée, entraînant de nouvelles additions à la flore marine de l'océan Atlantique sud-ouest. Dans ce travail, nous avons réévalué la taxonomie du genre scytosiphonacée *Colpomenia* (Endlicher) Derbès & Solier de la Patagonie argentine en intégrant des informations sur le gène mitochondrial *cox3* avec des observations morpho-anatomiques. Nous montrons ici que des spécimens argentins ont été regroupés dans deux grands clades attribués à *Colpomenia peregrina* Sauvageau et *Colpomenia claytoniae* S.M.Boo *et al.*, constituant le premier signalement de ces espèces dans l'océan Atlantique sud-ouest. Au sein du large clade de *C. claytoniae*, les spécimens ont été regroupés dans deux lignées distinctes présentant une divergence de 2,72-4,09 %, suggérant la présence de diversité cryptique. L'une de ces lignées (Lignée 1) a une distribution dans l'océan Indo-Pacifique et inclut le spécimen type de *C. claytoniae* de Corée, tandis que l'autre lignée (Lignée 2) a une distribution dans l'océan Atlantique-Pacifique. Les représentants argentins de la Lignée 2 présentent un thalle sacciforme et convoluté jusqu'à 6,5 cm, quatre couches de cellules médullaires (267 µm de long), des sores plurangiaux étendus et confluents formés de plurangies (48 µm de long) et de paraphyses uni ou bicellulaires (42 µm de long). Compte tenu de ces résultats, nous décrivons ici la nouvelle espèce *Colpomenia patagonica* M.E. Croce & Santiañez, sp. nov. Notre travail ajoute trois espèces de *Colpomenia* à la flore benthique marine connue de l'Argentine, augmentant ainsi le nombre d'algues marines signalées en Patagonie, et contribuant à de nouvelles connaissances sur la diversité et la distribution des espèces des Scytosiphonaceae.

MOTS CLÉS
Océan atlantique, *Colpomenia claytoniae*, diversité cryptique, Patagonie, Phaeophyceae, Scytosiphonaceae, espèce nouvelle.

INTRODUCTION

Colpomenia (Endlicher) Derbès & Solier is a genus of brown marine macroalga under the family Scytosiphonaceae Ardissone & Strafforello with a heteromorphic life cycle, where the macroscopic gametophyte is saccate and hollow, and the microscopic sporophyte is filamentous or pseudodiscoid (Clayton 1979; Dy *et al.* 2023). *Colpomenia* species are widely distributed and are inhabiting the low intertidal zone of temperate and warm coasts across different ocean basins (Lee *et al.* 2013). Of the eight *Colpomenia* species flagged as taxonomically accepted in Algaebase (Guiry & Guiry 2026), *Colpomenia sinuosa* (Roth) Derbès & Solier (type species), *Colpomenia peregrina* Sauvageau and *Colpomenia claytoniae* S.M.Boo, K.M.Lee, G.Y.Cho & W.Nelson have a cosmopolitan distribution, and the last two are regarded as invasive in regions outside the northwestern Pacific Ocean (Lee *et al.* 2014). Molecular phylogenetic studies using various genetic markers have revealed complex relationships within this group of algae such as paraphyly and crypticity (see Santiañez & Wynne (2024) for a concise review on the genus). Part of the taxonomic conflicts within the genus *Colpomenia* were resolved by segregating the new genera *Dactylosiphon* Santiañez, K.M.Lee, S.M.Boo & Kogame (Santiañez *et al.*

2018a) and *Encephalophycus* Santiañez (Santiañez 2022), based on morpho-anatomical and molecular phylogenetic information. However, phylogenetic relationships are still yet to be resolved within the clades of the widespread *C. sinuosa, C. peregrina* and *C. claytoniae*, which have shown indications of high genetic and cryptic diversity (Lee *et al.* 2013, 2014; Martins *et al.* 2021, 2022). These unresolved phylogenetic relationships may be, in part, related to the limited taxonomic knowledge and absence of molecular data available from certain regions of the world.

Colpomenia peregrina was originally regarded as a variety of *C. sinuosa* (i.e. *Colpomenia sinuosa* var. *peregrina* Derbès & Solier). This variety got the attention of botanists in the 1920s as it was invading the coasts of Europe and causing damage on oyster beds in France (Blackler 1967). Sauvageau (1927), however, noted the distinct vegetative and reproductive characters of *C. sinuosa* var. *peregrina* and elevated it to species level (i.e. *Colpomenia peregrina*). Blackler (1967), and later Clayton (1975), noticed that the specimens ascribed to *C. peregrina* were highly variable, and recognized the existence of two morphological forms in temperate and tropical waters of Australia. Cho *et al.* (2005) studied *rbc*L and ITS sequences of *C. peregrina* specimens collected from both Pacific and Atlantic Oceans, and found two lineages consistent with the two morphotypes recognized by Clayton (1975) that were clearly resolved within the large *C. peregrina* clade. Later, Boo *et al.* (2011) segregated these two lineages within *C. peregrina* and described *C. claytoniae* (as *C. claytonii*) using *cox*3-based molecular-assisted taxonomic study. *Colpomenia claytoniae* is distinguished from *C. peregrina* in being epilithic, having larger and irregularly convoluted thalli, fewer cortical cell layers but with many medullary cell layers, and plurilocular sporangia with fewer locules (Boo *et al.* 2011). Subsequent molecular-assisted taxonomic studies of Scytosiphonaceae including *cox*1 and *rbc*L molecular markers demonstrated that *C. claytoniae* was widely distributed in the Pacific (Martins *et al.* 2021; Dy *et al.* 2023; Vieira *et al.* 2024). The currently known distribution range of this species includes both Eastern and Western coasts of the North Pacific Ocean (Korea, China, Japan and United States), the South Pacific Ocean (Australia, New Zealand and French Polynesia) and the South-Eastern Atlantic Ocean (South Africa).

In the southwestern Atlantic Ocean, records of *Colpomenia* refer only to the species *C. sinuosa* (Asensi 1966; González-Etchebehere *et al.* 2017; Steigleder *et al.* 2019; Martins *et al.* 2022). In Argentina, Asensi (1966) reported *C. sinuosa* as a widely distributed species, occurring in temperate and cold localities in the continent, as well as in the Malvinas (Falkland) Islands and South Georgia Islands. Other mentions of *C. sinuosa* in Argentina were made by Boraso (2013), Asensi & Küpper (2012), and Poza *et al.* (2017). All of these authors reported the epiphytic habit of *C. sinuosa* gametophytes on *Corallina* Linnaeus beds in the lower intertidal.

In recent years, several globose *Colpomenia* were collected from the Patagonian region of Argentina. Of these, two morphotypes were recognized: one with a thin and deeply folded thalli that easily collapsed when exposed during low tide; the other with a thicker and less folded thalli that maintained an inflated shape. Considering the challenging taxonomy of *Colpomenia* species, and the utility of molecular data (i.e. mitochondrial *cox*3 gene marker) in informing species boundaries and confirming identities of highly polymorphic taxa in the tribe Hydroclathreae (Santiañez 2023) of the Scytosiphonaceae (e.g. Boo *et al.* (2011); Huisman *et al.* (2018); Santiañez *et al.* (2018a, b); Dy *et al.* (2023); Vieira *et al.* (2024)), we here conduct a molecular-assisted taxonomic study on the globose morphotypes of *Colpomenia* from the Atlantic Patagonia using *cox*3 sequence data in combination with morpho-anatomical observations. The aim of this study was to reassess the taxonomy of the scytosiphonacean genus *Colpomenia* from Patagonian Argentina.

MATERIAL AND METHODS

Samples of *Colpomenia* (Table 1) were collected during winter and spring between the years 2014 and 2018 at the Patagonian coast of Puerto Madryn (42°46'48.2"S, 64°00'06.4"W), Chubut, Argentina (Fig. 1). Additionally, *Scytosiphon* C.Agardh specimens collected in 2011 from Los Pocitos (40°27'00.0"S, 62°25'12.0"W), Buenos Aires, Argentina, were included in this study. Macroscopic saccate-globose *Colpomenia* thalli were collected at the low intertidal zone. Thalli were rinsed with seawater and fragments of each specimen were dehydrated in silica-gel for DNA extraction. The remainder of the specimens were used for morphological observations, and later deposited as reference material at the Herbarium of the Universidad Nacional del Sur (BBB; acronym follows Thiers 2025) in Bahía Blanca, Argentina.

Total genomic DNA was extracted from silica-gel dried samples and mitochondrial *cox*3 gene was amplified and sequenced as described in Santiañez *et al.* (2018b). A *cox*3 dataset for Scytosiphonaceae was created by compiling the newly generated sequences and those publicly available in GenBank. The *cox*3 dataset that we used was 552 bp long and composed of 166 *Colpomenia* sequences and 55 sequences from other scytosiphonacean taxa (Appendix 1). *Pylaiella littoralis* (Linnaeus) Kjellman (Acinetosporaceae) and *Ectocarpus* sp. Lyngbye (Ectocarpaceae C.Agardh) were used as outgroups. Sequences were aligned using MUSCLE (Edgar 2004) in MEGA11 (Tamura *et al.* 2021). Maximum likelihood (ML) and Bayesian Inference (BI) analyses were conducted separately and independently. The best-fit model of nucleotide substitution for both approaches was inferred according to Akaike information criterion (AIC). ML analyses were done in IQTREE2 v.2.2.0 (Minh *et al.* 2020) under the GTR+F+I+R4 model according to the integrated ModelFinder (Kalyaanamoorthy *et al.* 2017) and using 1 000 bootstrap replicates. BI was conducted in MrBayes v.3.2.7 (Ronquist *et al.* 2012) under the best fit model (GTR+I+G) based on MrModelTest2 (Nylander 2004). Pairwise distance values (*p*-distances) among sequences of *Colpomenia* species included in this study were computed using MEGA11 (Tamura *et al.* 2021).

Preliminary phylogenetic analyses of *cox*3 sequence data suggested that specimens recovered within the large *C. claytoniae*

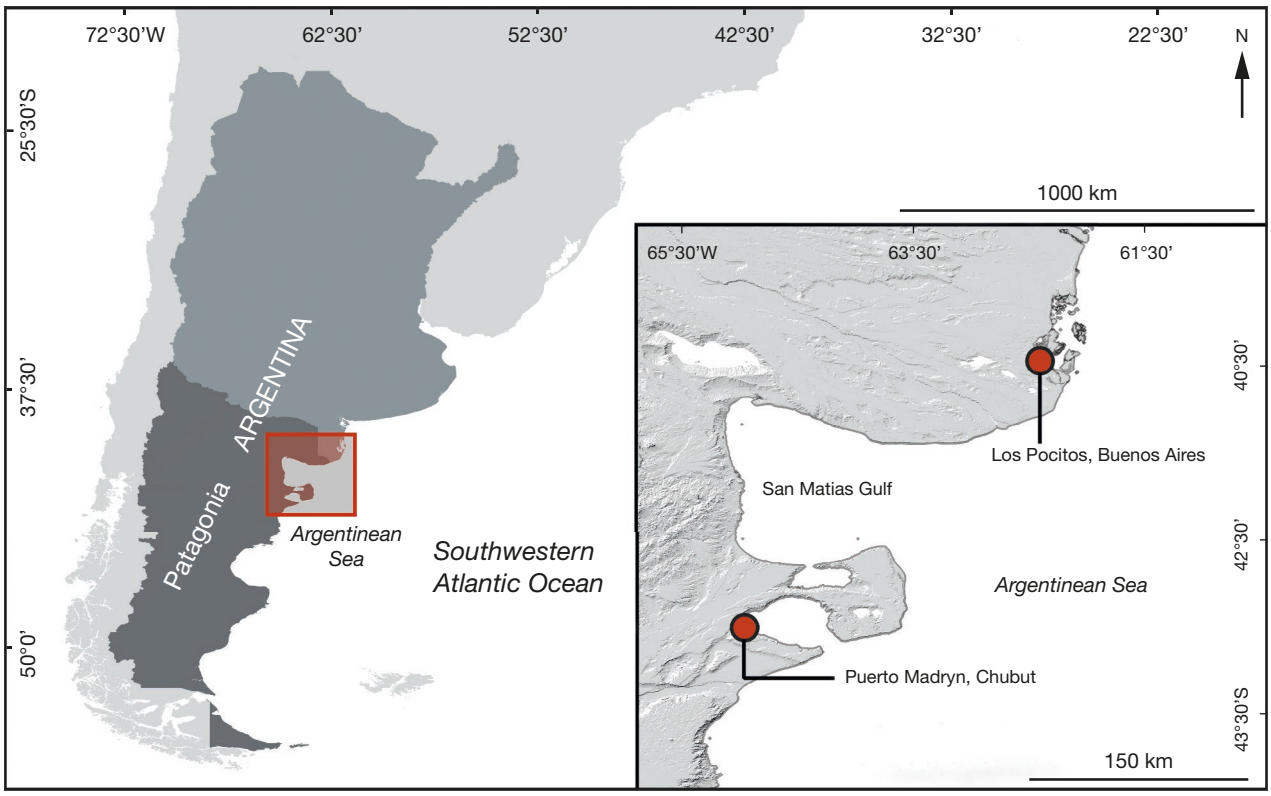

Fig. 1. — Map showing the geographic location of the collection sites in Argentina on the southwestern Atlantic Ocean.

clade showed indications of the occurrence of cryptic diversity, therefore, we conducted four species delimitation analysis: Automatic Barcode Gap Discovery (ABGD) (Puillandre *et al.* 2012), Assemble Species by Automatic Partitioning (ASAP) (Puillandre *et al.* 2021), Poisson Tree Processes (PTP) (Zhang *et al.* 2013) and Generalized Mixed Yule Coalescent (GMYC) (Fujisawa & Barraclough 2013). ABGD and ASAP were performed online at the platform SPART EXPLORER from the Muséum national d'Histoire naturelle (available at https://spartexplorer.mnhn.fr/). For ABGD, the parameters were set as follows: relative gap width (X) of 0.10, pmin of 0.001, pmax of 0.10, and a bin of 20; meanwhile, for ASAP, the default parameters were used. Both ABGD and ASAP were computed under the K2P model. PTP was done with the online implementation by Zhang *et al.* (2013) (available at https://species.h-its.org/ptp/). The rooted tree was run for 500 000 generations with a burn-in of 25%. For GMYC, an ultrametric tree was created with BEAST2 (Bouckaert *et al.* 2019) using the model averaging package, bModelTest (Bouckaert & Drummond 2017), under an optimized relaxed clock and coalescent constant prior. Four independent runs were performed; the log and tree files were both combined in LogCombiner (Drummond & Rambaut 2007). The consensus tree was created using TreeAnnotator (Drummond & Rambaut 2007). The resulting ultrametric tree was then used for the subsequent GMYC analysis in R software (R Core Team 2024), using the "splits" package (Fujisawa & Barraclough 2013).

Morpho-anatomical examination of thalli was done on fresh samples and/or sections of specimens preserved in formaldehyde-acetic acid-alcohol (1: 1 :8) solution. Sections were obtained by hand or with a microtome following the protocol of Armińana & Breijo (2006) as described in Croce & Freshwater (2024). All specimens used for identifications were deposited as reference material at BBB. Observations were made with an ARCANO ZTX-T stereomicroscope (Arcano, Beijing, China) and a Nikon Eclipse E100 (Nikon, Tokyo, Japan) compound microscope. Photomicrographs were taken with a Canon EOS 2000D (Canon, Tokyo, Japan) mounted on microscopes. Morphometric measurements were obtained under the microscope using an ocular micrometer and/or calculated from photographs using ImageJ v.1.52 (Schneider *et al.* 2012).

RESULTS

Phylogenetic analyses

A total of 18 *cox*3 sequences were newly generated in this study, 16 of which were derived from *Colpomenia* specimens, while two were from *Scytosiphon* (Table 1). In both our ML and BI analyses, eight of the 18 sequences clustered with known sequences of *C. claytoniae*, while eight *cox*3 sequences formed a clade with other *C. peregrina* sequences. Meanwhile, the sequences from our *Scytosiphon* specimens clustered with the newly described *Scytosiphon shibazakiorum* Hoshino & Kogame.

In our *cox*3 tree (Fig. 2), a large *C. claytoniae* clade was found to have two distinct lineages (herein referred as

TABLE 1. — List of samples of *Colpomenia* (Endlicher) Derbès & Solier that were used in this study and accession numbers of *cox*3 sequences published in GeneBank.

Species and collections details	Voucher	GenBank accession number
***Colpomenia patagonica* M.E. Croce & Santiañez, sp. nov.**		
Puerto Madryn, Chubut; 42°46'48.2"S, 64°00'06.4"W; 26.VI.2014	BBBAP0063	PZ122730
Puerto Madryn, Chubut; 42°46'48.2"S, 64°00'06.4"W; 26.VI.2014	BBBAP0064	PZ122731
Puerto Madryn, Chubut; 42°46'48.2"S, 64°00'06.4"W; 01.XII.2016	BBBAP0091	PZ122727
Puerto Madryn, Chubut; 42°46'48.2"S, 64°00'06.4"W; 01.XII.2016	BBBAP0093	PZ122728
Puerto Madryn, Chubut; 42°46'48.2"S, 64°00'06.4"W; 15.IX.2018	BBBMEC198	PZ122732
Puerto Madryn, Chubut; 42°46'48.2"S, 64°00'06.4"W; 15.IX.2018	BBBMEC199	PZ122733
Puerto Madryn, Chubut; 42°46'48.2"S, 64°00'06.4"W; 15.IX.2018	BBBMEC200	PZ122734
***Colpomenia claytoniae* S.M.Boo, K.M.Lee, G.Y.Cho & W.Nelson**		
Puerto Madryn, Chubut; 42°46'48.2"S, 64°00'06.4"W; 01.XII.2016	BBBAP0094	PZ122729
***Colpomenia peregrina* Sauvageau**		
Puerto Madryn, Chubut; 42°46'48.2"S, 64°00'06.4"W; 01.XII.2016	BBBAP0092	PZ122735
Puerto Madryn, Chubut; 42°46'48.2"S, 64°00'06.4"W; 09.X.2017	BBBAP0113	PZ122736
Puerto Madryn, Chubut; 42°46'48.2"S, 64°00'06.4"W; 09.X.2017	BBBAP0114	PZ122737
Puerto Madryn, Chubut; 42°46'48.2"S, 64°00'06.4"W; 09.X.2017	BBBAP0115	PZ122738
Puerto Madryn, Chubut; 42°46'48.2"S, 64°00'06.4"W; 09.X.2017	BBBAP0116	PZ122739
Puerto Madryn, Chubut; 42°46'48.2"S, 64°00'06.4"W; 09.X.2017	BBBAP0117	PZ122740
Puerto Madryn, Chubut; 42°46'48.2"S, 64°00'06.4"W; 09.X.2017	BBBAP0118	PZ122741
Puerto Madryn, Chubut; 42°46'48.2"S, 64°00'06.4"W; 09.X.2017	BBBAP0119	PZ122742
Los Pocitos, Buenos Aires; 40°27'00.0"S, 62°25'12.0"W; VIII.2011	BBBMEC47	PZ122743
Los Pocitos, Buenos Aires; 40°27'00.0"S, 62°25'12.0"W; VIII.2011	BBBMEC49	PZ122744

"Lineage 1" and "Lineage 2"; sequence divergence: 2.72-4.09%). In the first lineage (Lineage 1-*C. claytoniae sensu stricto*), one Argentinian *Colpomenia* sequence formed a highly supported clade (UFBS: 97; BPP: 0.98) with specimens from the type locality of *C. claytoniae* in Goseong, South Korea (Boo *et al.* 2011), and specimens from Hong Kong, Australia, French Polynesia, South Africa, New Zealand, Japan, and United States, with intraspecific sequence divergences of 0-3.17%. Meanwhile, in the second lineage (Lineage 2) seven *Colpomenia* specimens from Argentina formed a highly supported (UFBS: 99; BPP: 1.0) and closely associated grouping (intraspecific sequence divergences: 0-0.46%) alongside other members from Chile, South Korea and United States. Lastly, the other eight *Colpomenia* specimens from Argentina clustered with sequences of *C. peregrina* specimens from other cold and/or temperate marine regions, such as Canada, United States, United Kingdom, France, Russia, South Korea, China, Mexico, New Zealand and Australia with sequence divergences among conspecifics ranging from 0-4.18%. Sequence divergences between the clades of *Colpomenia* present in Argentina were: 2.72-4.09% between Lineage 1 and Lineage 2 of *C. claytoniae*, 5.00-7.72% between Lineage 1 and *C. peregrina*, and 4.63-6.68% between Lineage 2 and *C. peregrina* (Appendix 2). Pairwise divergences between these three lineages and other species of *Colpomenia* are shown in Appendix 3.

Of the four delimitation methods, ABGD, PTP and GMYC recovered two lineages, which corresponded to Lineage 1-*C. claytoniae s. s.* and Lineage 2-*C. patagonica* M.E. Croce & Santiañez, sp. nov., whereas ASAP did not recognize these two clades as distinct species. PTP and GMYC also appear to overestimate the number of groups within Lineage 1-*C. claytoniae sensu stricto*: GMYC recognized two subclades within Lineage 1 and PTP found three subclades.

MORPHO-ANATOMY OF *COLPOMENIA* FROM ARGENTINIAN PATAGONIA

Family SCYTOSIPHONACEAE Ardisonne & Straforrello
Genus *Colpomenia* (Endlicher) Derbès & Solier

Colpomenia patagonica M.E. Croce & Santiañez, sp. nov. (Fig. 3)

TYPE MATERIAL. — **Argentina** • Chubut, Puerto Madryn; 42°46'48.2"S, 64°00'06.4"W; 01.XII.2016; *Ailen M. Poza*; holotype: BBB AP0093; GenBank: PZ122728 (*cox3*) • *ibid.*; *Ailen M. Poza*; isotype: BBB AP0091; GenBank: PZ122727 (*cox3*) • *ibid.*; 26.VI.2014; *Juan Escobar*; paratypes: BBB AP0063, BBB AP0064; GenBank: PZ122730, PZ122731 (*cox3*) • *ibid.*; 15.IX.2018; *M. Emilia Croce*; paratypes: BBB MEC198, BBB MEC199, BBB MEC200; GenBank: PZ122732, PZ122733, PZ122734 (*cox3*).

ETYMOLOGY. — The species epithet "*patagonica*" refers to its occurrence in the Patagonian coasts of Argentina and Chile.

ECOLOGY. — Grows epiphytic on other seaweeds such as *Corallina* in shallow intertidal areas, from early winter to late spring.

DISTRIBUTION. — Argentina (this study), Chile (as "*C. peregrina*", accession number: GU252664, GenBank), United States (Boo *et al.* 2011), Korea (Boo *et al.* 2011).

DESCRIPTION

Thalli are saccate, deeply folded, and are inflated but easily collapsed upon water loss, reaching 6.5 cm in size (Fig. 3A). Rhizoids arise as projections from the cortical cells. Cortical cells are polygonal in surface view, with one chloroplast and a prominent pyrenoid, 7.5-18.5 µm wide (Fig. 3B). Cortex is composed of 1-2 layers of cuboidal to broadly obovate cells, 6-15 µm in size (Fig. 3C). Medulla is composed of three-four layers of rounded to obovate

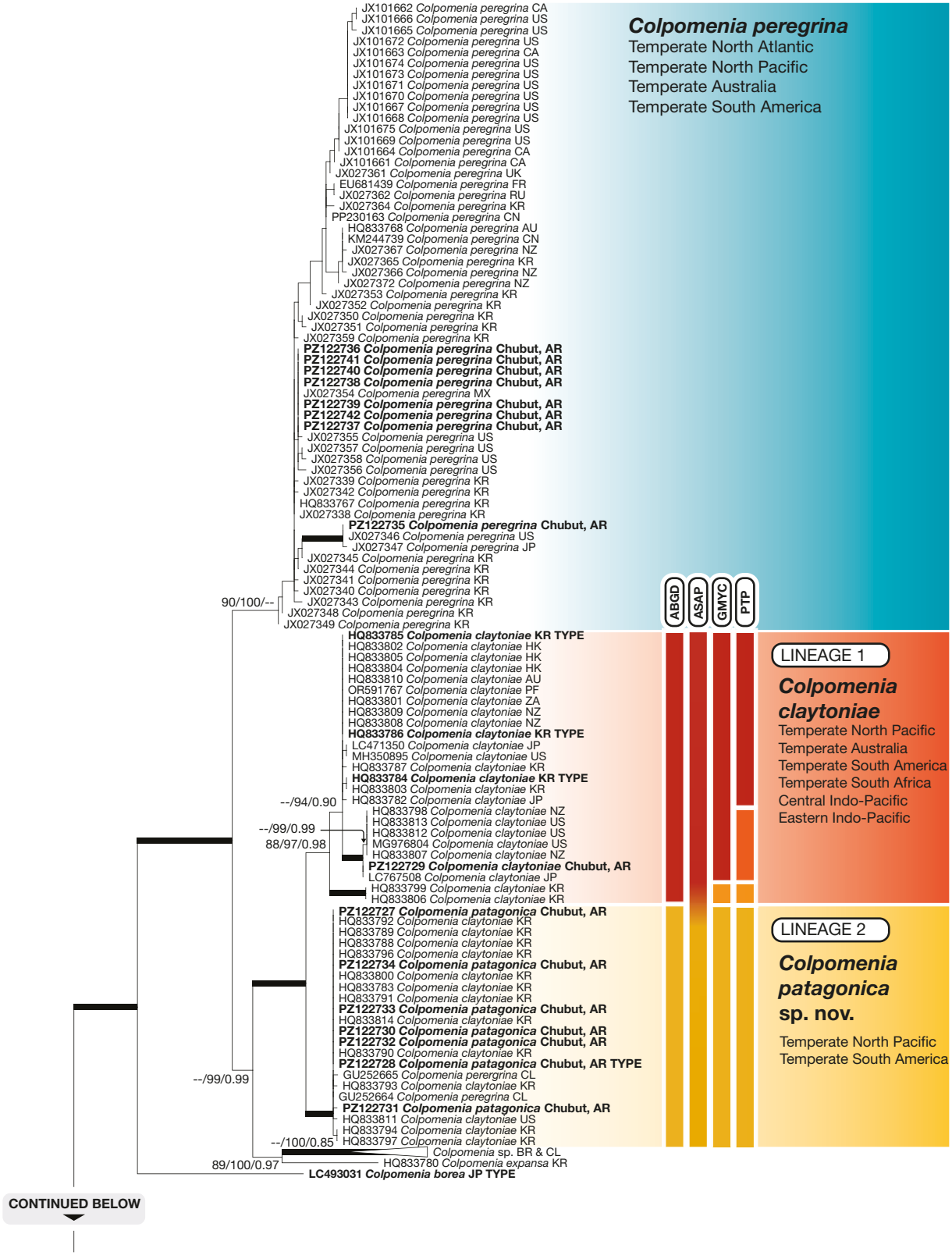

Fig. 2. — Maximum likelihood tree of *Colpomenia* (Endlicher) Derbès & Solier and *Scytosiphon* C.Agardh species from Argentina within the family Scytosiphonaceae Ardissone & Strafforello based on *cox3* sequence data, including the results of delimitation analyses (**red**, **orange** and **yellow** bars). Support values in the form of approximate likelihood ratio test percentages (aLRT), ultrafast bootstrap (UFBS) and Bayesian posterior probabilities (BPP) are shown at each branch. **Thickened lines** indicate highly supported nodes (UFBS: ≥95%; aLRT: ≥95%; and BPP: ≥0.95). Values <85% (aLRT), <85% (UFBS), and <0.85 (BPP) are removed. Abbreviation: **ABGD**, Automatic Barcode Gap Discovery; **ASAP**, Assemble Species by Automatic Partitioning; **GMYC,** Generalized Mixed Yule Coalescent; **PTP**, Poisson Tree Processes.

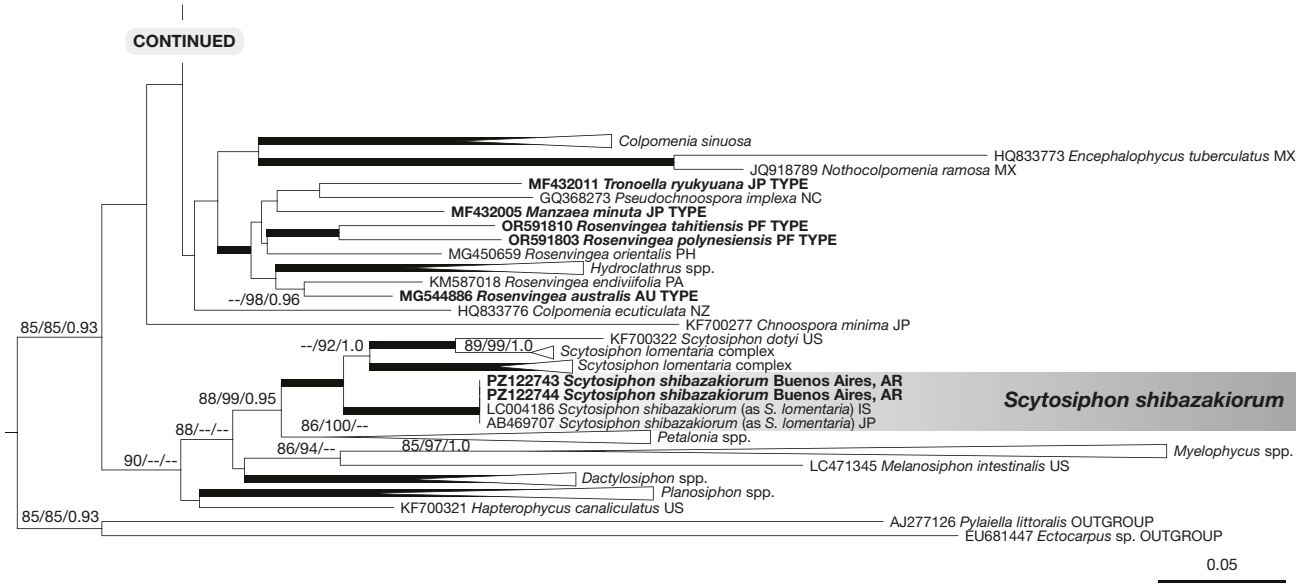

FIG 2. — Continuation.

medullary cells that are progressively larger but more collapsed from the cortex to the hollow center, to 267 µm at the widest (Fig. 3C). Hairs are abundant, multicellular, arising in groups from pits, particularly from medullary cells near the surface, each hair arises separately from one medullary cell (Fig. 3D). Plurangial sori are ecuticulate, forming very extensive and irregular patches (Fig. 3E, F). Plurangia are uni- to biseriate, up to eight locules, to 48 µm long (Fig. 3G, H). Paraphyses are abundant, uni- to bicellular, cylindrical to clavate, as long as or shorter than plurangia, to 42 µm long (Fig. 3H).

Colpomenia claytoniae S.M.Boo, K.M.Lee, G.Y.Cho & W.Nelson (Fig. 4)

Colpomenia claytoniae S.M.Boo, K.M.Lee, G.Y.Cho & W.Nelson, (Boo *et al.* 2011).

SPECIMEN EXAMINED. — **Argentina** • Chubut, Puerto Madryn; 42°46'48.2"S, 64°00'06.4"W; 01.XII.2016; *Ailen M. Poza* (BBB AP0094); GenBank: PZ122729 (*cox*3).

TYPE LOCALITY. — South Korea, Sangjokam, Goseong (Boo *et al.* 2011).

DISTRIBUTION. — Argentina (this study), Australia, French Polynesia, Hong Kong, Japan, Korea, New Zealand, South Africa, United States (Boo *et al.* 2011; Guiry & Guiry 2025).

DESCRIPTION

Thallus is saccate, somewhat sinuous, with a slightly firm consistency, and 4 cm in size (Fig. 4A). Rhizoids present; they originate as projections from the cortical cells. Cortical cells are polygonal in surface view with one parietal chloroplast and one large pyrenoid, 9-16 µm in size (Fig. 4B). Cortex is composed of 1-2 layers cuboidal to widely obovate pigmented cells, 9-17 µm in size (Fig. 4C). Medulla is composed of four layers of clear, rounded cells that are progressively larger from the cortex to the inner part; medullary cell sizes range from 21 to 122 µm (Fig. 4C). Hairs are abundant, multicellular, arising in groups from shallow pits near the cortex (Fig. 4D), when they appear deeper, the cortex is invaginated. Plurangial sori are ecuticulate, forming irregular patches (Fig. 4E, F). Plurangia are robust, biseriate, up to 10 locules, to 57 µm long (Fig. 4G, H). Paraphyses are abundant, composed of one to three cells, they are clavate when young but cylindrical and slender when mature, usually larger than plurangia, to 74 µm long (Fig. 4G, H).

Colpomenia peregrina Sauvageau (Fig. 5)

Colpomenia peregrina Sauvageau (Sauvageau 1927). — *Colpomenia sinuosa* var. *peregrina* Sauvageau (Sauvageau 1927).

Colpomenia peregrina (Sauvageau) Hamel (Hamel 1937)

SPECIMENS EXAMINED. — **Argentina** • Chubut, Puerto Madryn; 42°46'48.2"S, 64°00'06.4"W; 01.XII.2016; *Ailen M. Poza* (BBB AP0092); GenBank: PZ122735 (*cox*3) • *ibid.*; 09.XX.2017; *Ailen M. Poza* (BBB AP0113, BBB AP0114, BBB AP0115, BBB AP0116, BBB AP0117, BBB AP0118, BBB AP0119); GenBank: PZ122736, PZ122737, PZ122738, PZ122739, PZ122740, PZ122741, PZ122742 (*cox*3).

TYPE LOCALITY. — France, Vannes River, Morbihan (Vandermeulen 1984).

DISTRIBUTION.— Argentina (this study); Algeria, Australia, Azores, Baltic Sea, Britain, Bulgaria, Canada, Canary Islands, Channel Islands, Denmark, France, Greece, Hawaiian Islands, Ireland, Isla de Alborán, Italy, Japan, Korea, Lebanon, Liberia, Madeira, Mexico, Morocco, Netherlands, New Zealand, Norway, Pakistan, Portugal, Russia, Salvage Islands, Sardinia, Scandinavia, Solomon Islands,

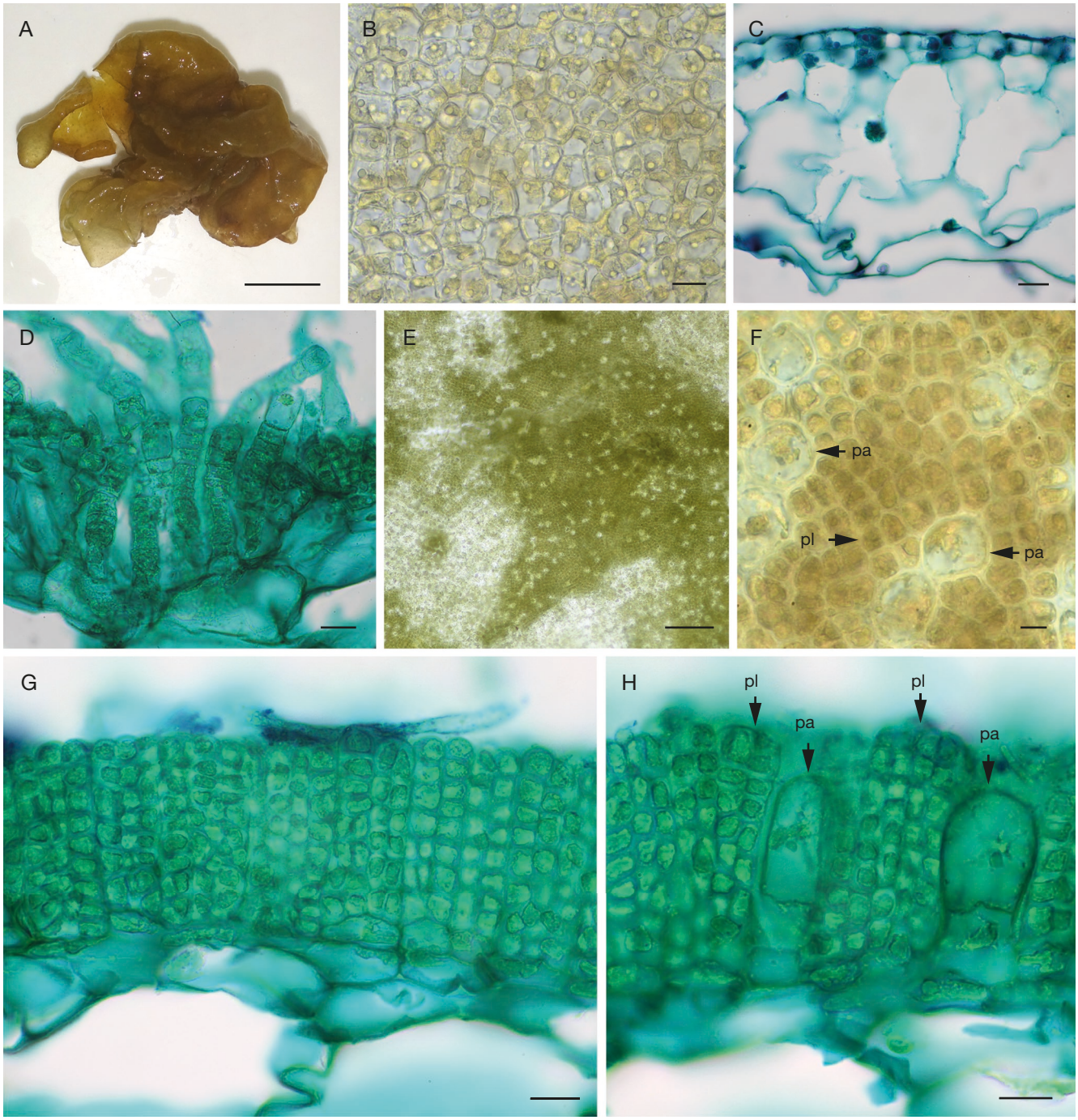

Fig. 3. — Morphology of *Colpomenia patagonica* M.E. Croce & Santiañez sp. nov. from Argentina: **A**, fresh specimen showing the saccate and deeply infolded thallus of the species (BBB AP0093); **B**, surface view of cortical cells showing distinct single, rounded pyrenoid per cell (BBB AP0093); **C**, cross-section through a vegetative part of the thallus showing small cortical cells and larger medullary cells (BBB AP0091); **D**, detail of multicellular phaeophycean hairs arising from pits (BBB AP0093); **E**, surface view of a fertile section showing the extensive sorus (dark portions; BBB AP0093); **F**, surface view of fertile section showing sorus of plurangia (pl; **black arrows**) interspersed with paraphyses (pa; **black arrows**); **G**, cross-section through a fertile thallus showing uni- to biseriate plurangia arranged in a palisade (BBB AP0093); **H**, cross-section showing details of shorter bicellular paraphyses (pa; **black arrows**) growing in between the larger plurangia (pl; **black arrows**). Abbreviations: **pl**, plurangia; **pa**, paraphyses. Scale bars: A, 1 cm; B-D, F, G, 10 µm; E, 100 µm; H?.

Spain, Spanish North Africa, Tanzania, United States (Guiry & Guiry 2025).

Description

Thalli are globose, inflated, sinuous, and with firm consistency, reaching 6 cm in size (Fig. 5A). Cortical cells are polygonal in surface view, with one parietal chloroplast and one large pyrenoid, 6-20.5 µm wide (Fig. 5B). Attachment system is well developed and extended; the long multicellular rhizoids arise as projections from the outer cortical cells (Fig. 5C). Cortex is composed of one-two layers of small, cuboidal to broadly obovate pigmented cells, 6.5-16 µm wide (Fig. 5C).

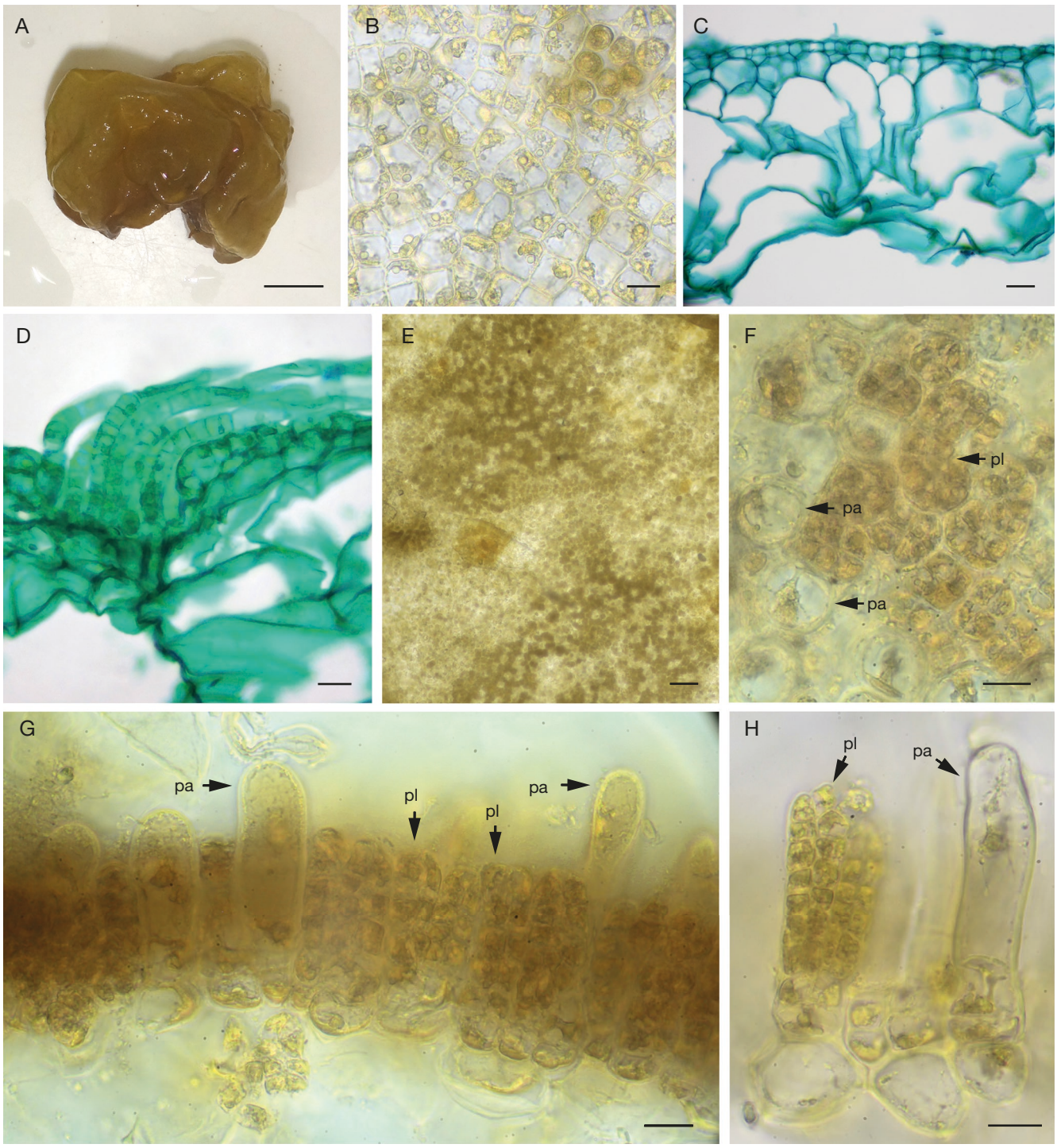

FIG. 4. — Morphology of *Colpomenia claytoniae* S.M.Boo, K.M.Lee, G.Y.Cho & W.Nelson from Argentina (BBB AP0094): **A**, fresh specimen showing the saccate and somewhat sinuous habit of the species; **B**, surface view of the thallus showing cortical cells and group of hairs (ha; **black arrow**); **C**, cross-section of the thallus showing relatively smaller cortical cells and abruptly larger medullary cells below; **D**, detail of a group of multicellular phaeophycean hairs arising from a shallow pit; **E**, surface view of a fertile thallus portion showing irregularly shaped plurangial sori (dark portions); **F**, close-up view of thallus surface showing mature plurangia (pl; **black arrow**) and paraphyses (pa; **black arrows**); **G**, cross section through a fertile part of the thallus showing paraphyses (pa; **black arrows**) and plurangia (pl; **black arrows**); **H**, cross-section of mature portion showing detail of relatively longer paraphyses (pa; **black arrow**) that are closely associated with plurangia (pl; **black arrows**). Abbreviations: **pl**, plurangia; **pa**, paraphyses. Scale bars: A, 1 cm; B, D, F-H, 10 µm; C, 20 µm; E, 50 µm.

The medulla is composed of 6(–7) layers of clear, rounded cells that are progressively larger from the cortex to the inner portions, to 452.5 µm at the widest (Fig. 5C). Hairs are abundant, multicellular, arising in groups from inner or external medullary cells; more than one hair may arise from a medullary cell (Fig. 5D, E). Plurangial sori are ecuticulate, forming very extensive and irregular patches on the thallus (Fig. 5F). Plurangia are uni- to biseriate, composed of six locules, to

TABLE 2. — Morpho-anatomical comparison among known *Colpomenia* (Endlicher) Derbès & Solier species in Argentina.

Characters	***Colpomenia patagonica* M.E.Croce & Santiañez, sp. nov.**	***Colpomenia claytoniae* S.M.Boo, K.M.Lee, G.Y.Cho & W.Nelson**	***Colpomenia peregrina* Sauvageau**	***Colpomenia sinuosa* (Mertens ex Roth) Derbès & Solier**
Thallus	Saccate, deeply folded; inflated but collapses after water loss; to 6.5 cm in size; epiphytic	Saccate, somewhat sinuous, slightly firm; to 30 cm in size; usually epilithic	Globose, inflated, sinuous; to 9 cm in size	Globular becoming expanded and folded, saccate, smooth to irregularly folded, sinuose, hollow, filled with water; to 16 cm in size; epilithic or epiphytic, attached by a broad base
Cortical cells	Small, pigmented; 1-2 layers	Small, pigmented; 1-2 layers	Small, pigmented; 1-3 layers	Small, pigmented; 1-3 layers
Shape (surface)	Polygonal	Polygonal	Polygonal	—
Size (surface, µm)	7.5-18.5	9-16	6-20.5	9-12
Shape (cross-section)	Cuboidal to broadly obovate	Cuboidal to broadly obovate	Cuboidal to broadly obovate	cuboidal
Size (cross-section, µm)	6-15	9-17	6.5-16	6-8
Medullary cells	Large, clear, progressively enlarging; 3-4 layers; rounded to obovate	Large, clear, progressively enlarging; up to 6 layers; rounded to obovate to irregularly shaped	Large, clear, up to 7 layers; rounded	Large, colorless, thin walled, 4-7 layers
Size (width, µm)	Up to 267	Up to 122	Up to 452.5	
Hair primordia				
Nature and arrangement	Abundant, grow in pits	Abundant, grow in pits	Abundant, grow in pits	Grow in pits
Plurangia				
Sori shape and nature	Ecuticulate, forms extensive and irregular patches	Ecuticulate, forming irregular patches	Ecuticulate, occur in irregular and very extensive patches	Cuticulate, punctate occasionally confluent, developed around a central hair pit
Arrangement	Erect, uni- to biseriate; each column divided up to 8 locules	Erect, uni- to biseriate; each column divided up to 10 locules	Erect, uni- to biseriate; each column divided up to 12 locules	Erect, uni- to biseriate; each column divided up to 10 locules
Length (cross section, µm)	48	57	52	43
Paraphyses				
Shape and nature	Abundant, composed of 1-2 cells; cylindrical to clavate; shorter or similar in size as plurangia	Abundant, composed of 1-3 cells; clavate to cylindrical; similar in size or longer than plurangia	Abundant, composed of 1-2 cells; clavate to cylindrical; similar in size or longer than plurangia	Composed of 1 cell; clavate; larger than plurangia
Length (cross section, µm)	Up to 42	Up to 74	Up to 53	Up to 50
References	This study	Boo *et al.* (2011; as *C. claytonii*); Dy *et al.* (2023); this study	Boo *et al.* (2011; as *C. claytonii*); this study	Roth (1906; as *Ulva sinuosa*), Parsons (1982); Ramirez & Rojas (1991); Womersley (1987)

52 µm long (Fig. 5G). Paraphyses are abundant, formed by one or two cells, they are clavate to cylindrical, similar in size or larger than plurangia, to 53 µm long (Fig. 5G).

DISCUSSION

The knowledge about the diversity of the scytosiphonacean genus *Colpomenia* has rapidly increased in recent decades owing largely to molecular-assisted taxonomic studies on the benthic flora of the Indo-Pacific Ocean region (i.e. Boo *et al.* 2011; Lee *et al.* 2012, 2013, 2014; Santiañez *et al.* 2018a; Song *et al.* 2019; Dy *et al.* 2023). In the Atlantic Ocean, the most comprehensive study on *Colpomenia* is a phylogeographic analysis of *C. sinuosa* from Brazil based on *cox*3 (Martins *et al.* 2022), wherein they reported the occurrence of two distinctive genetic groups separated by oceanographic barriers. Our present study constitutes the first molecular-based taxonomic study on *Colpomenia* from Argentina, revealing the presence of three species that coexisted in the same habitat and season: *C. claytoniae*, *C. peregrina*, and a new species, *C. patagonica* M.E. Croce & Santiañez, sp. nov.

The specimens of *Colpomenia* collected in Argentina were initially recognized as two morphotypes based on their external appearance; however, the *cox*3 phylogenetic analysis and the delimitation analyses showed that they correspond to

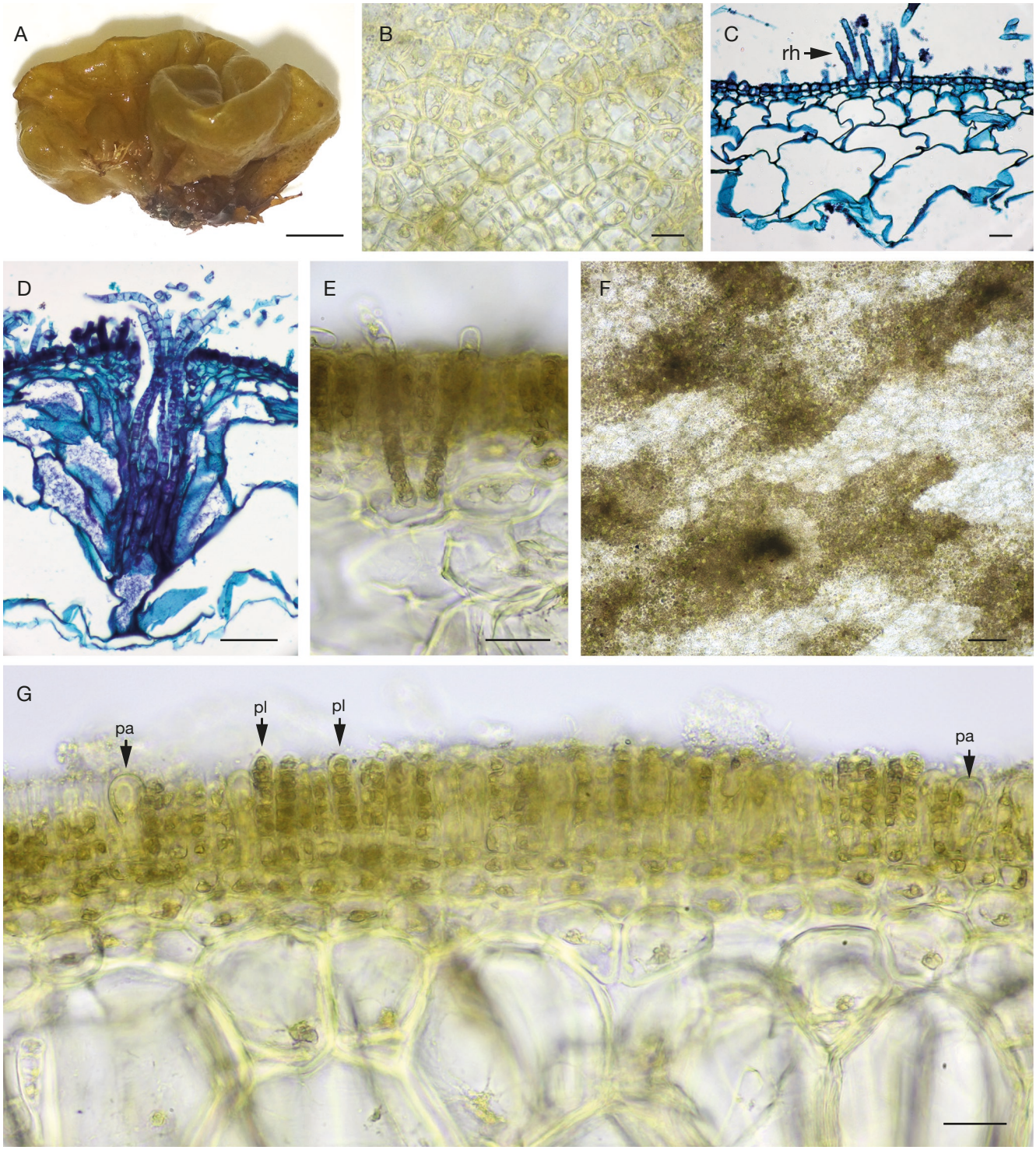

Fig. 5. — Morphology of *Colpomenia peregrina* Sauvageau from Argentina: **A**, fresh specimen showing saccate and sinuous appearance of *C. peregrina* Sauvageau (BBB AP0092); **B**, surface view of the thallus showing cortical cells (BBB AP0092); **C**, cross-section of the thallus (BBB AP0092) showing rhizoids (rh; **black arrow**); **D**, group of multicellular phaeophycean hairs arising from a deep medullary pit (BBB AP0092); **E**, multicellular hairs arising from the external medullary cells (BBB AP0116); **F**, surface view of a fertile thallus portion (BBB AP0092) showing extensive and irregularly shaped plurangial sori (dark parts); **G**, cross-section through a fertile thallus (BBBAP0119) showing plurangia (pl; **black arrows**) interspersed with paraphyses (pa; **black arrow**). Abbreviations: **pl**, plurangia; **pa**, paraphyses. Scale bars: A, 1 cm; B, G, 10 µm; C, 20 µm; D, E, 50 µm; F, 100 µm.

three species, denoting a certain level of crypticity within the genus. The morphotype with thin and deeply folded thallus that easily collapsed correspond either to *C. patagonica* M.E. Croce & Santiañez, sp. nov. or *C. claytoniae*. Although both species are externally similar, *C. patagonica* M.E. Croce & Santiañez, sp. nov. (Lineage 2) had distinct morpho-anatomical

characteristics as explained below. These differences are also reflected in their molecular phylogenetic relationship in having 2.72-4.09% sequence divergence from *C. claytoniae s.s.* (Lineage 1). The other morphotype with thicker and less folded thallus that maintained an inflated shape corresponded to *C. peregrina*. This second morphotype was genetically supported by the *cox*3 phylogeny and the majority of the delimitation analyses (Fig. 2).

Colpomenia claytoniae was originally described based on specimens from Korea, with representatives from Japan, Hong Kong, Australia, New Zealand, South Africa, and United States (Boo *et al.* 2011). The species is mainly distributed in the Indo-Pacific Ocean, and the only record in the Atlantic Ocean is in South Africa (Boo *et al.* 2011). We report here for the first time the occurrence of *C. claytoniae* (Lineage 1) in the Patagonian coast of Argentina, extending its distribution range to the southwestern Atlantic Ocean. We also noted that representatives of "*C. claytoniae*" from Korea, United States, Chile formed a clade with our *C. patagonica* M.E. Croce & Santiañez, sp. nov. (Lineage 2) and we consider them here as conspecifics.

Colpomenia claytoniae is distinguished from its congeners in having a larger and more irregular epilithic thallus with a deeply infolded surface (Boo *et al.* 2011). The morphology of the Argentinian specimen was similar to those described by Boo *et al.* (2011); however, we noted some differences in the size and nature of the membrane in our specimens (i.e. relatively smaller size, had two layers of cortical cells, and the medulla was thinner). When compared with the typical *C. claytoniae*, the reproductive characters of Argentinian specimen were also slightly different (i.e. plurangia were more robust and had more loculi, and the paraphyses were multicellular instead of unicellular; Table 2). The habit of the specimen found in Argentina was epiphytic, as it was found growing on *Corallina* beds.

Meanwhile, *C. patagonica* M.E. Croce & Santiañez, sp. nov. is similar to *C. claytoniae* in having saccate and somewhat convoluted thallus. However, *C. patagonica* M.E. Croce & Santiañez, sp. nov. is differentiated from *C. claytoniae* in having smaller thalli (≤6.5 cm vs ≤30 cm), fewer medullary cell layers (four layers vs six layers), larger medullary cells (≤267 µm vs ≤122 µm), and shorter plurangia (≤48 µm vs ≤57 µm) and paraphyses (≤42 µm vs ≤74 µm) (Table 2). Paraphyses also differ in their structure among the two species, they are uni- or bicellular in *C. patagonica* M.E. Croce & Santiañez, sp. nov. whereas they can be up to three-celled in *C. claytoniae* (Table 2). Morphologically, *C. patagonica* M.E. Croce & Santiañez, sp. nov. is also distinct from *C. peregrina* and *C. sinuosa*. That is, *C. patagonica* M.E. Croce & Santiañez, sp. nov. is smaller in size, and has saccate and deeply folded thallus while those of *C. peregrina* and *C. sinuosa* are relatively larger, and are globular and sinuous. Additionally, *C. patagonica* M.E. Croce & Santiañez, sp. nov. have relatively thinner membrane owing to them having fewer layers of cortical (one-two layers in *C. patagonica* M.E. Croce & Santiañez, sp. nov.; one-three layers in *C. peregrina* and *C. sinuosa*) and medullary cells (four layers in *C. patagonica* M.E. Croce & Santiañez, sp. nov.; four-seven layers in *C. peregrina* and *C. sinuosa*) (Table 2). The extensive and confluent plurangial sori of *C. patagonica* M.E. Croce & Santiañez, sp. nov. are similar to *C. peregrina*, but differ from the punctuate sori of *C. sinuosa*. Additionally, *C. patagonica* M.E. Croce & Santiañez, sp. nov. has shorter paraphyses and plurangia with fewer locules (eight) than *C. peregrina* (12) and *C. sinuosa* (ten).

Our study showed high levels of divergence within the *C. claytoniae s.s.* (Lineage 1; 0-3.17%) and *C. peregrina* (0-4.18%) clades. The highly divergent Korean sequences HQ833799 and HQ833806 are responsible for the observed divergence within of *Colpomenia claytoniae s.s.* (Lineage 1). This divergence was detected by both GMYC and PTP methods of delimitation, indicating that Lineage 1 may represent more than one genetic species. Moreover, the intraspecific divergence within *Colpomenia claytoniae s.s.* overlaps with the interspecific divergence between Lineages 1 and 2 (Appendix 2), leading to discrepancies among the delimitation results: while ASAP failed to detect differences between the two lineages, the other methods did. Nevertheless, the species delimitation inferred is congruent with the well-supported clades recovered in the phylogenetic tree, supporting the hypothesis that *C. claytoniae* and *C. patagonica* M.E. Croce & Santiañez, sp. nov. represent distinct taxonomic entities. Regarding *C. peregrina*, Lee *et al.* (2014) reported lower divergences for *cox*3, of up to 3.7%, in a previous work about the origin and dispersion pathways of this species. In addition to those findings, we observed that the Patagonian populations exhibit some degree of genetic diversity (0-2.36%) that was reflected in the *cox*3 tree. Altogether, these results suggest the occurrence of hidden species diversity within *C. claytoniae s.s.* (Lineage 1) and within *C. peregrina*. Although unraveling the phylogenetic relationships within these two divergent clades is beyond the scope of our work, we strongly recommend that it should be addressed in future work involving the genus *Colpomenia*. We expect that conducting a more thorough reassessment of the taxonomy of representatives from these clades will result in the discovery of new but hidden taxa.

Colpomenia peregrina is among the species of Scytosiphonaceae that became cosmopolitan after being introduced in several regions worldwide by human-mediated activities such as the oyster transfers (Lee *et al.* 2014; Guiry & Guiry 2025). The phylogeographic study conducted by Lee *et al.* (2014) revealed that the species may have originated and dispersed in the western Pacific Ocean, from where it expanded and colonized the northeastern Atlantic Ocean. Its presence in the northwestern Atlantic Ocean is regarded as a consequence of anthropogenic introductions (Lee *et al.* 2014). Seven of the Argentinian sequences of *C. peregrina* formed a clade with numerous sequences representative of the northeastern and northwestern Pacific, as well as the north Atlantic in the *cox*3 tree, whereas one of the Argentinian specimens (BBB AP0092) formed a well-supported subgroup with sequences from Japan and eastern United States within the large *C. peregrina* clade. Our recovery of *C. peregrina* in South America constitutes an important discovery considering that it was thought to be absent in the region until now (Cho *et al.* 2005).

Sauvageau (1927) recognized *C. peregrina* as different from *C. sinuosa* when studying the specimens introduced in the oyster reefs in France (Blackler 1967). Later, Vandermeulen (1984) reassessed the type material of *C. peregrina* and recognized the confluent and ecuticulate plurangial sori as characters distinguishing it from *C. sinuosa*. The specimens of *C. peregrina* found in Argentina were similar to the type material in having ecuticulate plurangia and confluent sori; however, there was certain degree of variability among them, including the number of medullary cell layers (i.e. four-seven cells) and the hairs originated either from external medullary cells or from inner medullary cells (Table 2). Despite its origin in the northwestern Pacific, the type locality of *C. peregrina* is in the northeastern Atlantic Ocean (Sauvageau 1927). However, there is some uncertainty about the specific location of the type (Guiry & Guiry 2025). Some authors mention the region of Brittany, in France, as the type locality (Womersley 1987: 298; Silva *et al.* 1996: 627; Green *et al.* 2012), whereas others cite the Department of Morbihan, within Brittany (Vandermeulen 1984: 325; Dy *et al.* 2023: Table 1). According to Vandermeulen (1984: 325) Sauvageau's specimen was collected from the oyster beds at Vannes River, in Morbihan (France).

The widely distributed type species *C. sinuosa* was not recovered in the study site, despite having been the only representative of *Colpomenia* mentioned in the Argentinian phycological literature for many decades (Boraso 2013; Raffo *et al.* 2014). Although *Colpomenia* is reported to occur as a perennial component of the macroalgal flora along the coast of Argentina (Asensi & Küpper 2012), the genus has not been found in the most recent surveys of temperate coasts at latitudes lower than 42°S (Becherucci *et al.* 2014; Croce *et al.* 2015; Paniagua 2015), suggesting that the assumption of its occurrence along the entire Argentinian coast is questionable. The presence of *C. sinuosa* in South America has been reported by several authors in Peru, Chile, Uruguay and Brazil (Etcheverry 1986; Alvítez & Rodríguez 2005; González-Etchebehere *et al.* 2017; Steigleder *et al.* 2019; Martins *et al.* 2022). In Brazil, Martins *et al.* (2022) reported the existence of two genetically distinct clades of *C. sinuosa* that are separated by a biogeographic barrier at 20.5°S latitude. Its presence along the coasts of Brazil has been confirmed in a recent phylogeographic study using *cox*3 sequences (Martins *et al.* 2022), representing the only molecular dataset of *C. sinuosa* available from South America. In Uruguay, *C. sinuosa* has been reported by González-Etchebehere *et al.* (2017) and Steigleder *et al.* (2019), although, to our knowledge there is no associated molecular data available for the species from this country. For the Pacific Patagonian region, Ramírez & Rojas (1991) reported the presence of *Colpomenia* specimens with punctuate sori and cuticulate plurangia, which they ascribed to *C. sinuosa* and showed this species is widely distributed from 20°S to 40°S along the coast of Chile. For the Atlantic Patagonian region, perennial populations of *C. sinuosa* were reported in waters around 47°S (Asensi & Küpper 2012), whereas the populations occurring at lower latitudes at 42°S are known as annual and are found only during the temperate-cold season (Poza *et al.* 2017). Considering the seasonality, and the fact that the specimens used for this study were collected from early winter to late spring throughout several years (see Table 1), the absence of *C. sinuosa* among the samples obtained is not likely a sampling artifact, suggesting this species could be present only at higher latitudes. The previous reports of *C. sinuosa* for the region around 42°S were probably *C. claytoniae, C. peregrina* or the new species *C. patagonica* M.E. Croce & Santiañez, sp. nov. but ascribed to *C. sinuosa* as it was previously thought to be common and cosmopolitan. Asensi (1966) and Boraso (2013) described the thalli of *C. sinuosa* from Argentina as globose, hollow, more or less spheric to irregularly flattened and sinuous, from 3 to 10 cm in size, attached by a broad base and epiphytic on *Corallina*. To our knowledge there is no information available about the internal anatomic characters of the specimens of *C. sinuosa* studied by Asensi (1966); therefore, the reports of *C. sinuosa* from Argentina could represent any of the three species found in this study. Considering this, we underscore the need to critically examine the long-standing assumption that a single, cosmopolitan and highly polymorphic species occurs within the Scytosiphonaceae (Santiañez *et al.* 2018a).

Our molecular-assisted taxonomic work on *Colpomenia* increased the number of seaweed records in Argentina and highlighted the increasing role and utility of molecular tools in unravelling patterns of seaweed diversity and distribution across different ocean basins. We expect that taxonomic studies on other seaweed groups in the region would result in better understanding of the diversity of Argentinian seaweed flora. With our molecular confirmation on the extended distribution range of *C. peregrina* and *C. claytoniae*, as well as our description of *C. patagonica* M.E. Croce & Santiañez, sp. nov. in Argentina in the southwestern Atlantic Ocean, we underscore here the need to conduct a thorough molecular-based reassessment of algal diversity of seaweeds not only in Argentina but also in the southwestern Atlantic Ocean.

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APPENDICES

Appendix 1. — List of publicly available *cox3* sequences of *Colpomenia* (Endlicher) Derbès & Solier and related taxa that were used for molecular analyses. The column "**Group**" refers to the groups defined in Figure 3.

GenBank accession number	Species name	Group	Country
JX101662	*Colpomenia peregrina*	*Colpomenia peregrina*	Canada
JX101666	*Colpomenia peregrina*	*Colpomenia peregrina*	United States
JX101665	*Colpomenia peregrina*	*Colpomenia peregrina*	United States
JX101672	*Colpomenia peregrina*	*Colpomenia peregrina*	United States
JX101663	*Colpomenia peregrina*	*Colpomenia peregrina*	Canada
JX101674	*Colpomenia peregrina*	*Colpomenia peregrina*	United States
JX101673	*Colpomenia peregrina*	*Colpomenia peregrina*	United States
JX101671	*Colpomenia peregrina*	*Colpomenia peregrina*	United States
JX101670	*Colpomenia peregrina*	*Colpomenia peregrina*	United States
JX101667	*Colpomenia peregrina*	*Colpomenia peregrina*	United States
JX101668	*Colpomenia peregrina*	*Colpomenia peregrina*	United States
JX101675	*Colpomenia peregrina*	*Colpomenia peregrina*	United States
JX101669	*Colpomenia peregrina*	*Colpomenia peregrina*	United States
JX101664	*Colpomenia peregrina*	*Colpomenia peregrina*	Canada
JX101661	*Colpomenia peregrina*	*Colpomenia peregrina*	Canada
JX027361	*Colpomenia peregrina*	*Colpomenia peregrina*	United Kingdom
EU681439	*Colpomenia peregrina*	*Colpomenia peregrina*	France
JX027362	*Colpomenia peregrina*	*Colpomenia peregrina*	Russia
JX027364	*Colpomenia peregrina*	*Colpomenia peregrina*	South Korea
PP230163	*Colpomenia peregrina* (as *Co. sinuosa*)	*Colpomenia peregrina*	China
HQ833768	*Colpomenia peregrina*	*Colpomenia peregrina*	Australia
KM244739	*Colpomenia peregrina*	*Colpomenia peregrina*	China
JX027367	*Colpomenia peregrina*	*Colpomenia peregrina*	New Zealand
JX027365	*Colpomenia peregrina*	*Colpomenia peregrina*	South Korea
JX027366	*Colpomenia peregrina*	*Colpomenia peregrina*	New Zealand
JX027372	*Colpomenia peregrina*	*Colpomenia peregrina*	New Zealand
JX027353	*Colpomenia peregrina*	*Colpomenia peregrina*	South Korea
JX027352	*Colpomenia peregrina*	*Colpomenia peregrina*	South Korea
JX027350	*Colpomenia peregrina*	*Colpomenia peregrina*	South Korea
JX027351	*Colpomenia peregrina*	*Colpomenia peregrina*	South Korea
JX027359	*Colpomenia peregrina*	*Colpomenia peregrina*	South Korea
JX027354	*Colpomenia peregrina*	*Colpomenia peregrina*	Mexico
JX027355	*Colpomenia peregrina*	*Colpomenia peregrina*	United States
JX027357	*Colpomenia peregrina*	*Colpomenia peregrina*	United States
JX027358	*Colpomenia peregrina*	*Colpomenia peregrina*	United States
JX027356	*Colpomenia peregrina*	*Colpomenia peregrina*	United States
JX027339	*Colpomenia peregrina*	*Colpomenia peregrina*	South Korea
JX027342	*Colpomenia peregrina*	*Colpomenia peregrina*	South Korea
HQ833767	*Colpomenia peregrina*	*Colpomenia peregrina*	South Korea
JX027338	*Colpomenia peregrina*	*Colpomenia peregrina*	South Korea
JX027346	*Colpomenia peregrina*	*Colpomenia peregrina*	United States
JX027347	*Colpomenia peregrina*	*Colpomenia peregrina*	Japan
JX027345	*Colpomenia peregrina*	*Colpomenia peregrina*	South Korea
JX027344	*Colpomenia peregrina*	*Colpomenia peregrina*	South Korea
JX027341	*Colpomenia peregrina*	*Colpomenia peregrina*	South Korea
JX027340	*Colpomenia peregrina*	*Colpomenia peregrina*	South Korea
JX027343	*Colpomenia peregrina*	*Colpomenia peregrina*	South Korea
JX027348	*Colpomenia peregrina*	*Colpomenia peregrina*	South Korea
JX027349	*Colpomenia peregrina*	*Colpomenia peregrina*	South Korea
PZ122735	*Colpomenia peregrina*	*Colpomenia peregrina*	Argentina
PZ122736	*Colpomenia peregrina*	*Colpomenia peregrina*	Argentina
PZ122737	*Colpomenia peregrina*	*Colpomenia peregrina*	Argentina
PZ122738	*Colpomenia peregrina*	*Colpomenia peregrina*	Argentina
PZ122739	*Colpomenia peregrina*	*Colpomenia peregrina*	Argentina
PZ122740	*Colpomenia peregrina*	*Colpomenia peregrina*	Argentina
PZ122741	*Colpomenia peregrina*	*Colpomenia peregrina*	Argentina
PZ122742	*Colpomenia peregrina*	*Colpomenia peregrina*	Argentina
HQ833785	*Colpomenia claytoniae* (TYPE)	*Colpomenia claytoniae*	South Korea
HQ833802	*Colpomenia claytoniae*	*Colpomenia claytoniae*	Hong Kong
HQ833805	*Colpomenia claytoniae*	*Colpomenia claytoniae*	Hong Kong
HQ833804	*Colpomenia claytoniae*	*Colpomenia claytoniae*	Hong Kong

Appendix 1. — Continuation.

GenBank Accession number	Species name	Group	Country
HQ833810	*Colpomenia claytoniae*	*Colpomenia claytoniae*	Australia
OR591767	*Colpomenia claytoniae*	*Colpomenia claytoniae*	French Polynesia
HQ833801	*Colpomenia claytoniae*	*Colpomenia claytoniae*	South Africa
HQ833809	*Colpomenia claytoniae*	*Colpomenia claytoniae*	New Zealand
HQ833808	*Colpomenia claytoniae*	*Colpomenia claytoniae*	New Zealand
HQ833786	*Colpomenia claytoniae* (TYPE)	*Colpomenia claytoniae*	South Korea
LC471350	*Colpomenia claytoniae*	*Colpomenia claytoniae*	Japan
MH350895	*Colpomenia claytoniae*	*Colpomenia claytoniae*	United States
HQ833787	*Colpomenia claytoniae*	*Colpomenia claytoniae*	South Korea
HQ833784	*Colpomenia claytoniae* (TYPE)	*Colpomenia claytoniae*	South Korea
HQ833803	*Colpomenia claytoniae*	*Colpomenia claytoniae*	South Korea
HQ833782	*Colpomenia claytoniae*	*Colpomenia claytoniae*	Japan
HQ833798	*Colpomenia claytoniae*	*Colpomenia claytoniae*	New Zealand
HQ833813	*Colpomenia claytoniae*	*Colpomenia claytoniae*	United States
HQ833812	*Colpomenia claytoniae*	*Colpomenia claytoniae*	United States
MG976804	*Colpomenia claytoniae*	*Colpomenia claytoniae*	United States
HQ833807	*Colpomenia claytoniae*	*Colpomenia claytoniae*	New Zealand
LC767508	*Colpomenia claytoniae*	*Colpomenia claytoniae*	Japan
HQ833799	*Colpomenia claytoniae*	*Colpomenia claytoniae*	South Korea
HQ833806	*Colpomenia claytoniae*	*Colpomenia claytoniae*	South Korea
PZ122729	*Colpomenia claytoniae*	*Colpomenia claytoniae*	Argentina
HQ833792	*Colpomenia patagonica* (as *Co. claytoniae*)	*Colpomenia patagonica*	South Korea
HQ833789	*Colpomenia patagonica* (as *Co. claytoniae*)	*Colpomenia patagonica*	South Korea
HQ833788	*Colpomenia patagonica* (as *Co. claytoniae*)	*Colpomenia patagonica*	South Korea
HQ833796	*Colpomenia patagonica* (as *Co. claytoniae*)	*Colpomenia patagonica*	South Korea
HQ833800	*Colpomenia patagonica* (as *Co. claytoniae*)	*Colpomenia patagonica*	South Korea
HQ833783	*Colpomenia patagonica* (as *Co. claytoniae*)	*Colpomenia patagonica*	South Korea
HQ833791	*Colpomenia patagonica* (as *Co. claytoniae*)	*Colpomenia patagonica*	South Korea
HQ833814	*Colpomenia patagonica* (as *Co. claytoniae*)	*Colpomenia patagonica*	South Korea
HQ833790	*Colpomenia patagonica* (as *Co. claytoniae*)	*Colpomenia patagonica*	South Korea
GU252665	*Colpomenia patagonica* (as Co. peregrina)	*Colpomenia patagonica*	Chile
HQ833793	*Colpomenia patagonica* (as *Co. claytoniae*)	*Colpomenia patagonica*	South Korea
GU252664	*Colpomenia patagonica* (as Co. peregrina)	*Colpomenia patagonica*	Chile
HQ833811	*Colpomenia patagonica* (as *Co. claytoniae*)	*Colpomenia patagonica*	United States
HQ833794	*Colpomenia patagonica* (as *Co. claytoniae*)	*Colpomenia patagonica*	South Korea
HQ833797	*Colpomenia patagonica* (as *Co. claytoniae*)	*Colpomenia patagonica*	South Korea
PZ122727	*Colpomenia patagonica*	*Colpomenia patagonica*	Argentina
PZ122728	*Colpomenia patagonica* (TYPE)	*Colpomenia patagonica*	Argentina
PZ122730	*Colpomenia patagonica*	*Colpomenia patagonica*	Argentina
PZ122731	*Colpomenia patagonica*	*Colpomenia patagonica*	Argentina
PZ122732	*Colpomenia patagonica*	*Colpomenia patagonica*	Argentina
PZ122733	*Colpomenia patagonica*	*Colpomenia patagonica*	Argentina
PZ122734	*Colpomenia patagonica*	*Colpomenia patagonica*	Argentina
KJ418170	*Colpomenia* sp.	*Colpomenia* sp. BR & CL	Brazil
KJ418172	*Colpomenia* sp.	*Colpomenia* sp. BR & CL	Brazil
KJ418171	*Colpomenia* sp.	*Colpomenia* sp. BR & CL	Brazil
GU252667	*Colpomenia* sp. (as *Co. peregrina*)	*Colpomenia* sp. BR & CL	Chile
KJ418153	*Colpomenia* sp.	*Colpomenia* sp. BR & CL	Brazil
KJ418167	*Colpomenia* sp.	*Colpomenia* sp. BR & CL	Brazil
LC493031	*Colpomenia borea* (TYPE)	*Colpomenia* borea	Japan
JX944733	*Colpomenia sinuosa*	*Colpomenia sinuosa*	Australia
JX944744	*Colpomenia sinuosa*	*Colpomenia sinuosa*	New Zealand
JX944742	*Colpomenia sinuosa*	*Colpomenia sinuosa*	New Zealand
JX944759	*Colpomenia sinuosa*	*Colpomenia sinuosa*	South Korea
JX944731	*Colpomenia sinuosa*	*Colpomenia sinuosa*	United States
JX944743	*Colpomenia sinuosa*	*Colpomenia sinuosa*	New Zealand
HQ833777	*Colpomenia sinuosa*	*Colpomenia sinuosa*	South Korea
JX944756	*Colpomenia sinuosa*	*Colpomenia sinuosa*	France
JX944758	*Colpomenia sinuosa*	*Colpomenia sinuosa*	South Korea
JX944760	*Colpomenia sinuosa*	*Colpomenia sinuosa*	South Korea
JX944737	*Colpomenia sinuosa*	*Colpomenia sinuosa*	Australia
JX944738	*Colpomenia sinuosa*	*Colpomenia sinuosa*	Australia
JX944736	*Colpomenia sinuosa*	*Colpomenia sinuosa*	Australia
JX944735	*Colpomenia sinuosa*	*Colpomenia sinuosa*	Australia
JX944741	*Colpomenia sinuosa*	*Colpomenia sinuosa*	Australia
JX944734	*Colpomenia sinuosa*	*Colpomenia sinuosa*	Australia
JX944732	*Colpomenia sinuosa*	*Colpomenia sinuosa*	Australia
JX944746	*Colpomenia sinuosa*	*Colpomenia sinuosa*	Greece

Appendix 1. — Continuation.

GenBank accession number	Species name	Group	Country
HQ833810	*Colpomenia claytoniae*	*Colpomenia claytoniae*	Australia
OR591767	*Colpomenia claytoniae*	*Colpomenia claytoniae*	French Polynesia
HQ833801	*Colpomenia claytoniae*	*Colpomenia claytoniae*	South Africa
HQ833809	*Colpomenia claytoniae*	*Colpomenia claytoniae*	New Zealand
HQ833808	*Colpomenia claytoniae*	*Colpomenia claytoniae*	New Zealand
HQ833786	*Colpomenia claytoniae* (TYPE)	*Colpomenia claytoniae*	South Korea
LC471350	*Colpomenia claytoniae*	*Colpomenia claytoniae*	Japan
MH350895	*Colpomenia claytoniae*	*Colpomenia claytoniae*	United States
HQ833787	*Colpomenia claytoniae*	*Colpomenia claytoniae*	South Korea
HQ833784	*Colpomenia claytoniae* (TYPE)	*Colpomenia claytoniae*	South Korea
HQ833803	*Colpomenia claytoniae*	*Colpomenia claytoniae*	South Korea
HQ833782	*Colpomenia claytoniae*	*Colpomenia claytoniae*	Japan
HQ833798	*Colpomenia claytoniae*	*Colpomenia claytoniae*	New Zealand
HQ833813	*Colpomenia claytoniae*	*Colpomenia claytoniae*	United States
HQ833812	*Colpomenia claytoniae*	*Colpomenia claytoniae*	United States
MG976804	*Colpomenia claytoniae*	*Colpomenia claytoniae*	United States
HQ833807	*Colpomenia claytoniae*	*Colpomenia claytoniae*	New Zealand
LC767508	*Colpomenia claytoniae*	*Colpomenia claytoniae*	Japan
HQ833799	*Colpomenia claytoniae*	*Colpomenia claytoniae*	South Korea
HQ833806	*Colpomenia claytoniae*	*Colpomenia claytoniae*	South Korea
PZ122729	*Colpomenia claytoniae*	*Colpomenia claytoniae*	Argentina
HQ833792	*Colpomenia patagonica* (as *Co. claytoniae*)	*Colpomenia patagonica*	South Korea
HQ833789	*Colpomenia patagonica* (as *Co. claytoniae*)	*Colpomenia patagonica*	South Korea
HQ833788	*Colpomenia patagonica* (as *Co. claytoniae*)	*Colpomenia patagonica*	South Korea
HQ833796	*Colpomenia patagonica* (as *Co. claytoniae*)	*Colpomenia patagonica*	South Korea
HQ833800	*Colpomenia patagonica* (as *Co. claytoniae*)	*Colpomenia patagonica*	South Korea
HQ833783	*Colpomenia patagonica* (as *Co. claytoniae*)	*Colpomenia patagonica*	South Korea
HQ833791	*Colpomenia patagonica* (as *Co. claytoniae*)	*Colpomenia patagonica*	South Korea
HQ833814	*Colpomenia patagonica* (as *Co. claytoniae*)	*Colpomenia patagonica*	South Korea
HQ833790	*Colpomenia patagonica* (as *Co. claytoniae*)	*Colpomenia patagonica*	South Korea
GU252665	*Colpomenia patagonica* (as Co. peregrina)	*Colpomenia patagonica*	Chile
HQ833793	*Colpomenia patagonica* (as *Co. claytoniae*)	*Colpomenia patagonica*	South Korea
GU252664	*Colpomenia patagonica* (as Co. peregrina)	*Colpomenia patagonica*	Chile
HQ833811	*Colpomenia patagonica* (as *Co. claytoniae*)	*Colpomenia patagonica*	United States
HQ833794	*Colpomenia patagonica* (as *Co. claytoniae*)	*Colpomenia patagonica*	South Korea
HQ833797	*Colpomenia patagonica* (as *Co. claytoniae*)	*Colpomenia patagonica*	South Korea
PZ122727	*Colpomenia patagonica*	*Colpomenia patagonica*	Argentina
PZ122728	*Colpomenia patagonica* (TYPE)	*Colpomenia patagonica*	Argentina
PZ122730	*Colpomenia patagonica*	*Colpomenia patagonica*	Argentina
PZ122731	*Colpomenia patagonica*	*Colpomenia patagonica*	Argentina
PZ122732	*Colpomenia patagonica*	*Colpomenia patagonica*	Argentina
PZ122733	*Colpomenia patagonica*	*Colpomenia patagonica*	Argentina
PZ122734	*Colpomenia patagonica*	*Colpomenia patagonica*	Argentina
KJ418170	*Colpomenia* sp.	*Colpomenia* sp. BR & CL	Brazil
KJ418172	*Colpomenia* sp.	*Colpomenia* sp. BR & CL	Brazil
KJ418171	*Colpomenia* sp.	*Colpomenia* sp. BR & CL	Brazil
GU252667	*Colpomenia* sp. (as *Co. peregrina*)	*Colpomenia* sp. BR & CL	Chile
KJ418153	*Colpomenia* sp.	*Colpomenia* sp. BR & CL	Brazil
KJ418167	*Colpomenia* sp.	*Colpomenia* sp. BR & CL	Brazil
LC493031	*Colpomenia borea* (TYPE)	*Colpomenia* borea	Japan
JX944733	*Colpomenia sinuosa*	*Colpomenia sinuosa*	Australia
JX944744	*Colpomenia sinuosa*	*Colpomenia sinuosa*	New Zealand
JX944742	*Colpomenia sinuosa*	*Colpomenia sinuosa*	New Zealand
JX944759	*Colpomenia sinuosa*	*Colpomenia sinuosa*	South Korea
JX944731	*Colpomenia sinuosa*	*Colpomenia sinuosa*	United States
JX944743	*Colpomenia sinuosa*	*Colpomenia sinuosa*	New Zealand
HQ833777	*Colpomenia sinuosa*	*Colpomenia sinuosa*	South Korea
JX944756	*Colpomenia sinuosa*	*Colpomenia sinuosa*	France
JX944758	*Colpomenia sinuosa*	*Colpomenia sinuosa*	South Korea
JX944760	*Colpomenia sinuosa*	*Colpomenia sinuosa*	South Korea
JX944737	*Colpomenia sinuosa*	*Colpomenia sinuosa*	Australia
JX944738	*Colpomenia sinuosa*	*Colpomenia sinuosa*	Australia
JX944736	*Colpomenia sinuosa*	*Colpomenia sinuosa*	Australia
JX944735	*Colpomenia sinuosa*	*Colpomenia sinuosa*	Australia
JX944741	*Colpomenia sinuosa*	*Colpomenia sinuosa*	Australia
JX944734	*Colpomenia sinuosa*	*Colpomenia sinuosa*	Australia
JX944732	*Colpomenia sinuosa*	*Colpomenia sinuosa*	Australia
JX944746	*Colpomenia sinuosa*	*Colpomenia sinuosa*	Greece

Appendix 1. — Continuation.

GenBank accession number	Species name	Group	Country
HQ833778	*Colpomenia sinuosa*	*Colpomenia sinuosa*	South Africa
JX944725	*Colpomenia sinuosa*	*Colpomenia sinuosa*	Hawaii
MW981282	*Colpomenia sinuosa*	*Colpomenia sinuosa*	Brazil
MW981283	*Colpomenia sinuosa*	*Colpomenia sinuosa*	Brazil
JX944729	*Colpomenia sinuosa*	*Colpomenia sinuosa*	Hawaii
MW981284	*Colpomenia sinuosa*	*Colpomenia sinuosa*	Brazil
MW981285	*Colpomenia sinuosa*	*Colpomenia sinuosa*	Brazil
MW981286	*Colpomenia sinuosa*	*Colpomenia sinuosa*	Brazil
JX944730	*Colpomenia sinuosa*	*Colpomenia sinuosa*	Hawaii
JX944739	*Colpomenia sinuosa*	*Colpomenia sinuosa*	Australia
JX944753	*Colpomenia sinuosa*	*Colpomenia sinuosa*	Spain
JX944754	*Colpomenia sinuosa*	*Colpomenia sinuosa*	Spain
JX944755	*Colpomenia sinuosa*	*Colpomenia sinuosa*	Spain
JX944757	*Colpomenia sinuosa*	*Colpomenia sinuosa*	France
JX944752	*Colpomenia sinuosa*	*Colpomenia sinuosa*	Spain
JX944728	*Colpomenia sinuosa*	*Colpomenia sinuosa*	Hawaii
JX944745	*Colpomenia sinuosa*	*Colpomenia sinuosa*	Greece
JX944748	*Colpomenia sinuosa*	*Colpomenia sinuosa*	Oman
JX944747	*Colpomenia sinuosa*	*Colpomenia sinuosa*	Kuwait
OR591769	*Colpomenia sinuosa*	*Colpomenia sinuosa*	French Polynesia
OR591773	*Colpomenia sinuosa*	*Colpomenia sinuosa*	French Polynesia
OR591771	*Colpomenia sinuosa*	*Colpomenia sinuosa*	French Polynesia
OR591770	*Colpomenia sinuosa*	*Colpomenia sinuosa*	French Polynesia
OR591772	*Colpomenia sinuosa*	*Colpomenia sinuosa*	French Polynesia
JX944749	*Colpomenia sinuosa*	*Colpomenia sinuosa*	Philippines
JX944727	*Colpomenia sinuosa*	*Colpomenia sinuosa*	Hawaii
OR591775	*Colpomenia sinuosa*	*Colpomenia sinuosa*	French Polynesia
JX944740	*Colpomenia sinuosa*	*Colpomenia sinuosa*	Australia
OR591774	*Colpomenia sinuosa*	*Colpomenia sinuosa*	French Polynesia
OR591776	*Colpomenia sinuosa*	*Colpomenia sinuosa*	French Polynesia
JX944750	*Colpomenia sinuosa*	*Colpomenia sinuosa*	Indonesia
JX944751	*Colpomenia sinuosa*	*Colpomenia sinuosa*	Indonesia
JX944726	*Colpomenia sinuosa*	*Colpomenia sinuosa*	Hawaii
PP460011	*Colpomenia sinuosa*	*Colpomenia sinuosa*	China
OR591777	*Colpomenia sinuosa*	*Colpomenia sinuosa*	French Polynesia
JX944761	*Colpomenia sinuosa*	*Colpomenia sinuosa*	Taiwan
HQ833773	*Encephalophycus tuberculatus*	*Encephalophycus tuberculatus*	Mexico
JQ918789	*Nothocolpomenia ramosa*	*Nothocolpomenia ramosa*	Mexico
MF432011	*Tronoella ryukyuana* (TYPE)	*Tronoella ryukyuana*	Japan
GQ368273	*Pseudochnoospora implexa*	*Pseudochnoospora implexa*	New Caledonia
MF432005	*Manzaea minuta* (TYPE)	*Manzaea minuta*	Japan
OR591810	*Rosenvingea tahitiensis* (TYPE)	*Rosenvingea tahitiensis*	French Polynesia
OR591803	*Rosenvingea polynesiensis* (TYPE)	*Rosenvingea polynesiensis*	French Polynesia
MG450659	*Rosenvingea orientalis*	*Rosenvingea orientalis*	Philippines
MG450663	*Hydroclathrus rapanuii* (TYPE)	*Hydroclathrus rapanuii*	Chile
MF431998	*Hydroclathrus clathratus*	*Hydroclathrus clathratus*	Japan
MF432032	*Hydroclathrus tilesii*	*Hydroclathrus tilesii*	Japan
MF431978	*Hydroclathrus tenuis*	*Hydroclathrus tenuis*	Philippines
KM587018	*Rosenvingea endiviifolia*	*Rosenvingea endiviifolia*	Panama
MG544886	*Rosenvingea australis* (TYPE)	*Rosenvingea australis*	Australia
HQ833776	*Colpomenia ecuticulata*	*Colpomenia ecuticulata*	New Zealand
KF700277	*Chnoospora minima*	*Chnoospora minima*	Japan
GU252686	*Scytosiphon lomentaria*	*Scytosiphon lomentaria* complex	Chile
LC004157	*Scytosiphon lomentaria*	*Scytosiphon lomentaria* complex	United Kingdom
LC004182	*Scytosiphon lomentaria*	*Scytosiphon lomentaria* complex	Norway
LC004161	*Scytosiphon lomentaria*	*Scytosiphon lomentaria* complex	United Kingdom
LC004130	*Scytosiphon lomentaria*	*Scytosiphon lomentaria* complex	Ireland
AB469710	*Scytosiphon lomentaria*	*Scytosiphon lomentaria* complex	Japan
MN171303	*Scytosiphon lomentaria*	*Scytosiphon lomentaria* complex	South Korea
AB469754	*Scytosiphon lomentaria*	*Scytosiphon lomentaria* complex	Japan
KF700322	*Scytosiphon dotyi*	*Scytosiphon dotyi*	United States
LC004153	*Scytosiphon lomentaria*	*Scytosiphon lomentaria* complex	Ireland
LC004159	*Scytosiphon lomentaria*	*Scytosiphon lomentaria* complex	United Kingdom
EU681464	*Scytosiphon lomentaria*	*Scytosiphon lomentaria* complex	France
GU252678	*Scytosiphon lomentaria*	*Scytosiphon lomentaria* complex	Chile
LC004179	*Scytosiphon lomentaria*	*Scytosiphon lomentaria* complex	France
LC004138	*Scytosiphon lomentaria*	*Scytosiphon lomentaria* complex	Ireland
LC004186	*Scytosiphon shibazakiorum* (as *S. lomentaria*)	*Scytosiphon shibazakiorum*	Iceland

Appendix 1. — Continuation.

GenBank accession number	Species name	Group	Country
AB469707	*Scytosiphon shibazakiorum* (as *S. lomentaria*)	*Scytosiphon shibazakiorum*	Japan
PZ122743	*Scytosiphon shibazakiorum*	*Scytosiphon shibazakiorum*	Argentina
PZ122744	*Scytosiphon shibazakiorum*	*Scytosiphon shibazakiorum*	Argentina
GU252696	*Petalonia* sp. (as *S. lomentaria*)	*Petalonia* spp.	Chile
GU252698	*Petalonia* sp. (as *S. lomentaria*)	*Petalonia* spp.	Chile
GU252703	*Petalonia* sp. (as *S. lomentaria*)	*Petalonia* spp.	Chile
KU234660	*Petalonia* sp. (as *S. lomentaria*)	*Petalonia* spp.	Australia
LC471353	*Petalonia fascia*	*Petalonia* spp.	Japan
KF700317	*Petalonia binghamiae*	*Petalonia* spp.	South Korea
MH854520	*Petalonia tenella*	*Petalonia* spp.	Japan
LC472410	*Myelophycus simplex* (TYPE)	*Myelophycus* spp.	Japan
LC471340	*Myelophycus simplex*	*Myelophycus* spp.	Japan
LC471331	*Myelophycus caespitosus*	*Myelophycus* spp.	Japan
LC471311	*Myelophycus cavus*	*Myelophycus* spp.	Japan
LC471345	*Melanosiphon intestinalis*	*Melanosiphon intestinalis*	United States
JQ918806	*Dactylosiphon durvillei*	*Dactylosiphon* spp.	Chile
JQ918795	*Dactylosiphon bullosus*	*Dactylosiphon* spp.	United States
KF700280	*Dactylosiphon wynnei*	*Dactylosiphon* spp.	South Korea
GU252685	*Planosiphon gracilis* (as *S. lomentaria*)	*Planosiphon* spp.	Chile
LC504291	*Planosiphon gracilis* (TYPE)	*Planosiphon* spp.	Japan
LC490550	*Planosiphon nakamurae* (TYPE)	*Planosiphon* spp.	Japan
LC490559	*Planosiphon complanatus*	*Planosiphon* spp.	Japan
LC471355	*Planosiphon zosterifolius*	*Planosiphon* spp.	Japan
KF700321	*Hapterophycus canaliculatus*	*Hapterophycus canaliculatus*	United States
AJ277126	*Pylaiella littoralis*	OUTGROUP	—
EU681447	*Ectocarpus* sp.	OUTGROUP	—

Appendix 2. — Pairwise divergences of *cox3* sequences between the three lineages of *Colpomenia* (Endlicher) Derbès & Solier found in Argentina.

	***Colpomenia claytoniae s.s.* (Lineage 1)**		***Colpomenia patagonica* sp. nov. (Lineage 2)**	***Colpomenia peregrina***
Colpomenia claytoniae s.s. (Lineage 1)	0-3.17%		2.72-4.09%	5.00-7.72%
Colpomenia patagonica sp. nov. (Lineage 2)		—	0-0.46%	4.63-6.88%
Colpomenia peregrina		—	—	0-4.2%

Appendix 3. — Interspecific divergences between the lineages of *Colpomenia* (Endlicher) Derbès & Solier found in Argentina and other *Colpomenia* species based on *cox3* sequences.

	Colpomenia sinuosa	***Colpomenia borea***	***Colpomenia ecuticulata***	***Colpomenia expansa***
Colpomenia claytoniae s.s. (Lineage 1)	10.92-13.22%	9.42-10.89%	12.86-13.86%	6.34-7.25%
Colpomenia patagonica sp. nov. (Lineage 2)	11.78-13.59%	10.14-10.96%	11.78-13.24%	6.85-7.08%
Colpomenia peregrina	8.48-12.91%	9.06-10.51%	11.78-14.29%	5.28-8.33%