Table S1. Details of *rbc*L sequences used in this study with GenBank accession numbers. Bold letters indicate sequences generated in this study.

Species	Voucher code	Collection site; date	*rbc*L
Acanthophora dendroides Harvey	NCU-A-0000027	Dapdap, Tarangnan, Philippines; 22.iv.1998	MH388561
Acanthophora spicifera (M.Vahl) Børgesen	AC192	Kihei, Maui, Hawaii, USA; 5.iv.2006	GQ252538
Acanthophora sp.	PD1564	Rottnest Island, Western Australia, Australia; 15.iii.2015	MF094033
Acrocystis nana Zanardini	UA0166	Hilutungan, Philippines; 19.iv.1998	MH388562
Austrochondria chilensis (De Toni, Forti & M.Howe) G.H.Boo, M.T.Fujii, M.E.Ramirez & Mansilla	CNU049719	Huape, Corral, Valdivia, Chile; 15.x.2013	**MT365779**
Austrochondria chilensis	CNU049753	Bahia Mansa, Osorno, Chile; 16.x.2013	**MT365780**
Austrochondria chilensis	CNU063956	Playa Chica, Quintay, Valparaiso, Chile; 8.ix.2014	**MT365781**
Austrochondria chilensis	CNU063957	Maitencillo, Valparaiso, Chile; 12.vi.2014	**MT365782**
Chondria armata (Kützing) Okamura	SAP115358	Talak Berakit Pulau Kapes, Malaysia; 26.v.1999	MG255050
Chondria atropurpurea Harvey	FK012	Biscayne Bay, Florida, USA; 10.viii.2013	MH388516
Chondria baileyana (Montagne) Harvey	GWS011658	Pownal, Prince Edward Island, Canada; 29.vii.2008	KU564500
Chondria acrorhizophora Setchell & N.L.Gardner	-	Beach Club Reef (La Jolla Shores), San Diego County, California, USA; 1.vii.1996	AY172578
Chondria capensis (Harvey) Askenasy	D1004	South Africa; 2.iii.2011	KY927799
Chondria capillaris (Hudson) M.J.Wynne	SAP106295	Frinavarra, Ireland; 17.viii.2004	MG255052
Chondria coerulescens (J.Agardh) Sauvageau	25428	Biarritz, France; 19.iii.2011	MF094043
Chondria collinsiana M.Howe	SP399.865	Praia Rasa, Armação dos Búzios, Rio de Janeiro, Brazil, 13.i.2005	GU330225
Chondria crassicaulis Harvey	SAP115360	Innoshima, Hiroshima, Japan; 20.iv.2015	MG255053
Chondria dasyphylla (Woodward) C.Agardh	-	Bogue Sound, Carteret County, North Carolina, USA	U04021

Chondria decipiens Kylin	UC2025838	San Nicolas Island, California, USA; 14.xi.2012	MG255056
Chondria epiphytica Belous & Skriptsova	ASKR-964	Sea of Japan, Peter the Great Bay, Russkii Island, Achlyostyshev Bay, Russia; 17.vii.2023	PV417188
Chondria expansa Okamura	SAP115365	Kushimoto, Wakayama, Japan; 31.iii.2003	MG255057
Chondria intertexta P.C.Silva	SAP115364	Hachijo, Tokyo, Japan; 21.vii.2005	MG255059
Chondria littoralis Harvey	ce102	Duke University Marine Station, Beaufort, North Carolina, USA; 16.v.2003	KF672853
Chondria mageshimensis Tanaka & K.Nozawa	SAP115367	Innoshima, Hiroshima, Japan; 19.viii.2005	MG255060
Chondria pendula Belous & Skriptsova	ASKR-1107	Sea of Japan, Peter the Great Bay, Fal'shvyi Peninsula, Russia; 13.vii.2024	PV417189
Chondria polyrhiza Collins & Hervey	LAF-5-12-06-2-15	Twin Keys, Belize; 12.v.2006	KF564787
Chondria ryukyuensis Yamada	SAP115368	Kagoshima, Japan; 27.viii.2003	MG255061
Chondria scintillans G.Feldmann	JML0048	Roscoff-Theven, Brittany, France; 5.xii.2002	KF492775
Chondria succulenta (J.Agardh) Falkenberg	NSW879470	Observation Point, Batehaven, New South Wales, Australia; 30.v.2005	KY120336
Chondria tumulosa A.R.Sherwood & Huisman	ARS09888	Pearl and Hermes Atoll, Hawai, USA; 31.vii.2019	MT039606
Chondria sp.	D180	South Africa; 20.viii.2008	KY927804
Chondria sp.	PD1739	Coral Bay, Western Australia, Australia; 23.iii.2015	MF094044
Chondria sp.	PD1426	Geelong, Victoria, Australia; 3.ii.2015	MF094045
Chondria sp.	PD1759	Coral Bay, Western Australia, Australia; 24.iii.2015	MF094046
Chondria sp.	PD1430	Geelong, Victoria, Australia; 3.ii.2015	MF094047
Chondria sp.	PD1778	Exmouth, Western Australia, Australia; 25.iii.2015	MF094048
Chondria sp.	PD1961	Heron Island, Queensland, Australia; 17.v.2015	MF094049

Chondria sp.	PD620	Praia de Parati, Espirito Santo, Brazil; 8.iv.2014	MF101429
Chondria sp.	SAP115397	Shiretoko, Hokkaido, Japan; 21.viii.2017	MG843871
Chondria sp.	ARS03562	-	MT039617
Chondria sp.	ARS04529	-	MT039620
Chondrophycus cartilagineus (Yamada) Garbary & J.T.Harper	PH1004	Gujora Beach, Gujora-ri, Irun-myeon, Geoje-si, Gyeongsangnamdo, Korea; 18.iii.2023	PP898403
Cladhymenia lyallii Harvey	-	Lyall Bay, New Zealand; 21.iv.1994	AF259496
Cladhymenia oblongifolia J.D.Hooker & Harvey	A03	Marfells Beach, New Zealand	MF319149
Coeloclonium umbellatum (Harvey) J.Agardh	PD1606	Rottnest Island, Western Australia, Australia; 15.iii.2015	MF094052
Coeloclonium sp.	UA0240	Port MacDonnell, South Australia, Australia; 28.viii.1995	MH388575
Corynecladia elata (C.Agardh) Cassano, M.C.Oliveira & M.T.Fujii	NSW900764	Rottnest Island, Western Australia, Australia; 15.xi.2008	KY120339
Laurencia obtusa (Hudson) J.V.Lamouroux	455	Fanad Head, County Donegal, Ireland, 6.vii.1998	AF281881
Laurenciella marilzae (Gil-Rodríguez, Sentíes, Díaz-Larrea, Cassano & M.T.Fujii) Gil-Rodríguez, Sentíes, Díaz-Larrea, Cassano & M.T.Fujii	H.1501	Pta Hidalgo, Tenerife, Spain; 10.vi.2015	MF101410
Neochondria ammophila S.Sutti, M.Tani, Y.Yamagishi, T.Abe & K.Kogame	SAP115370	Momonai, Hokkaido, Japan; 29.vi.2016	MG255065
Neochondria nidifica (Harvey) S.Sutti, T.Abe, K.A.Miller & K.Kogame	UC2026095	Dana Point, California, USA; 12.xii.2012	MG255067
Nothochondria dimorphica Belous & Skriptsova	ASKR-1104	Sea of Japan, Peter the Great Bay, Agatovaya Bay, Russia; 12.vii.2024	PV417193
Ohelopapa flexilis (Setchell) F.Rousseau, Martin-Lescanne, Payri & L.Le Gall	O1A07	Tahara Reef, Tahiti, French Polynesia; 24.iii.2007	KX146187

Palisada furcata (Cordeiro-Marino & M.T.Fujii) Cassano & M.T.Fujii	SP399.928	Praia de Tambaú, Paraíba, Brazil; 24.ii.2004	GU330226
Waldoia antillana W.R.Taylor	LAF-06-2-04-32	Vicinity of Dry Tortugas, Gulf of Mexico; 2.vi.2004	KF672852
Yuzurua poiteaui (J.V.Lamouroux) Martin-Lescanne	SP470220	Cabbage Beach, Paradise Island, Bahamas; 7.vii.2018	PQ047480