

Pigment-based chloroplast types in dinoflagellates

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Supplement. This supplement includes basic information about the strains used in the present study, and mass pigment to chl *a* ratios

Table S1. Cultures used in this study; na: strain not available

Order and species	Strain code	Origin and isolation year	Isolator
DINOPHYSALES			
<i>Dinophysis acuminata</i> Claparède et Lachmann	VGO1063	Ría de Vigo, NW Spain, 2009	F. Rodríguez
<i>D. acuta</i> Ehrenberger	VGO1065	Ría de Pontevedra, Spain, 2010	F. Rodríguez
<i>D. caudata</i> Saville-Kent	VGO1064	Ría de Pontevedra, Spain, 2010	F. Rodríguez
<i>Dinophysis tripos</i> Gourret	VGO1062	Ría de Vigo, NW Spain, 2009	F. Rodríguez
GONYAULACALES			
<i>Alexandrium affine</i> (Inoue et Fukuyo) Balech	PA2V	Ría de Vigo, NW Spain, 1985	I. Bravo
<i>A. andersonii</i> Balech	CCMP1718	Town Cove, Eastham, MA, USA, 1987	S. Marquis
<i>A. andersonii</i>	SZN-12	Tyrrhenian Sea, Naples, Italy, na	M. Montesor
<i>A. andersonii</i>	VGO664	Saronikos Gulf, Greece, Mediterranean Sea, 2003	S. Fraga
<i>A. catenella</i> (Whedon et Kofoid) Balech	AT02	Thau Lagoon, France, Mediterranean Sea, 1998	D. Kulis
<i>A. catenella</i>	VGO609	Tarragona, Mediterranean Sea, 2002	S. Fraga
<i>A. catenella</i>	AL96	Monterey Bay, CA, USA, Pacific Ocean, year unknown	R. Gester
<i>A. insuetum</i> Balech	ICMB218	Puerto Arenys de Mar, Mediterranean Sea, 2006	N. Sampedro
<i>A. margalefi</i> Balech	VGO661	Els Alfacs, Tarragona, Mediterranean Sea, 2003	I. Bravo
<i>A. minutum</i> Halim	AL1V	Ría de Vigo, NW Spain, 1987	I. Bravo
<i>A. minutum</i>	AMAD01	Port River, S. Australia, Pacific Ocean, 1988	S. Blackburn
<i>A. minutum</i>	GHmin04	Denmark, Atlantic Ocean, 2001	G. Hansen
<i>A. minutum</i>	VGO577	La Fosca, Girona, Mediterranean Sea, 2002	S. Fraga

<i>A. ostensfeldii</i> (Paulsen) Balech et Tangen	AOTV-A1A	Föglö/Åland, Finland, Baltic Sea, 2004	A. Kemp
<i>A. ostensfeldii</i>	AOTV-A4A	Föglö/Åland, Finland, Baltic Sea, 2004	A. Kemp
<i>A. peruvianum</i> (Balech & Mendiola) Balech et Tangen	AM10C	Costa Brava, Mediterranean Sea, 2002	I. Bravo
<i>A. pseudogonyaulax</i> (Biecheler) Horoguchi	VGO706	Alfacs Bay, Ebro Delta, Mediterranean Sea, 2003	I. Bravo
<i>A. tamarense</i> (Lebour) Balech	CCMP1493	Da Yia Bay, China, Pacific Ocean, 1991	G. Usup
<i>A. tamarense</i>	MDQ1096	Mar del Plata, Argentina, Atlantic Ocean, 1996	I. Carreto
<i>A. tamarense</i>	PE1V	Ría de Vigo, NW Spain, 1984	I. Bravo
<i>A. tamarense</i>	VGO553	Kavala Harbour, Greece, Mediterranean Sea, 2002	S. Fraga
<i>A. tamutum</i> Montresor, Beran et John	VGO617	Els Alfacs, Tarragona, Mediterranean Sea, 2002	I. Bravo
<i>A. taylori</i> Balech	AM8V	Costa Brava, Mediterranean Sea, 1994	S. Fraga
<i>A. taylori</i>	VGO703	Alfacs Bay, Ebro Delta, Mediterranean Sea, 2003	I. Bravo
<i>Coolia canariensis</i> Fraga	VGO775	Tenerife, Canary Islands, Spain, 2004	S. Fraga
<i>C. canariensis</i>	VGO787	Tenerife, Canary Islands, Spain, 2004	S. Fraga
<i>C. monotis</i> Meunier	CM2V	Ría de Vigo, NW Spain, 1985	I. Bravo
<i>C. monotis</i>	CM6V	Almería, Spain, Mediterranean Sea, 1999	S. Fraga
<i>C. monotis</i>	RIKZ4	Yerseke, The Netherlands, Atlantic Ocean, 2000	L. Peperzak
<i>C. monotis</i>	SZN43	Naples, Italy, Mediterranean Sea, 1991	M. Montresor
<i>C. cf. monotis</i>	CCMP1345	Florida, USA, 1986	J. Bomber
<i>C. tropicalis</i> Faust	CCMP1744	Twin Cay, Belize, 1994	S. L. Morton
<i>C. cf. tropicalis</i>	VGO923	Manado, Indonesia, 2007	S. Fraga
<i>Fragilidium</i> sp.	IO 91-01	Cascais, Portugal, 2007	S. Fraga
<i>Fragilidium</i> sp.	VGO692	Elefsis Bay, Saronikos Gulf, Greece, 2003	S. Fraga
<i>Gambierdiscus excentricus</i> Fraga	VGO790	Tenerife, Canary Islands, Spain, 2004	S. Fraga
<i>Gambierdiscus</i> sp.	VGO920	Manado, Indonesia, Pacific Ocean, 2007	S. Fraga
<i>Gambierdiscus</i> sp.	KC81G1	Crete, Greece, Mediterranean Sea, 2007	K. Aligizaki
<i>Lingulodinium polyedrum</i> (Stein) Dodge	LP4V	Ría de Lorbé, NW Spain, 2000	S. Fraga
<i>L. polyedrum</i>	LP9V	Ría de Ares, NW Spain, 2002	S. Fraga
<i>Neoceratium furca</i> (Ehrenberg) Gómez, Moreira et Lopez-García	Nfurca1	Baiona, Ría de Vigo, NW Spain, 2009	F. Rodríguez
<i>Ostreopsis</i> cf. <i>ovata</i> Fukuyo	OS01BR	Rio de Janeiro, Brazil, Atlantic Ocean, 2000	S. Fraga
<i>O. cf. ovata</i>	VGO883	Lanzarote, Canary Islands, Atlantic Ocean, 2006	S. Fraga
<i>O. cf. ovata</i>	VGO613	Bahía de Abra, Madeira, Atlantic Ocean, 2002	S. Fraga
<i>O. cf. siamensis</i> Schmidt	OS3V	Almería, Spain, Mediterranean Sea, 1999	S. Fraga
<i>Protoceratium reticulatum</i> (Claparède et Lachmann) Bütschli	GG1AM	La Atunara, Cadiz, Mediterranean Sea, 1999	S. Fraga
<i>P. reticulatum</i>	CCMP404	Salton Lake, CA, USA, 1966	A. Dodson
<i>P. reticulatum</i>	CCMP1720	Biscayne Bay, Miami, FL, USA, 1994	P. Hargraves
GYMNODINIALES			
<i>Akashiwo sanguinea</i> (Hirasaka) Hansen et Moestrup	VGO138	Catalonian Coast, Mediterranean Sea, na	M. Delgado
<i>A. sanguinea</i>	VGO626	Greece, Mediterranean Sea, 2002	S. Fraga

<i>Amphidinium carterae</i> Hulburt	A01BR	Brazil, Atlantic Ocean, 2000	S. O. Lourenço
<i>A. carterae</i>	ACMK03	Maurice Island, Indian Ocean, 1996	J. Diogène
<i>A. carterae</i>	ACRN02	Reunion Island, Indian Ocean, 1992	J. Diogène
<i>A. carterae</i>	CS-212	Falmouth, MA, USA, Atlantic Ocean, 1954	R. Gillard
<i>A. cf. carterae</i>	A1V	Ría de Pontevedra, NW Spain, 1985	I. Bravo
<i>Barrufeta bravensis</i> Sampedro et Fraga	VGO859	La Fosca, Girona, Mediterranean Sea, 2005	S. Fraga
<i>B. bravensis</i>	VGO860	La Fosca, Girona, Mediterranean Sea, 2005	S. Fraga
<i>B. bravensis</i>	VGO864	La Fosca, Girona, Mediterranean Sea, 2005	S. Fraga
<i>Gymnodinium catenatum</i> Graham	GC11V	Ría de Vigo, Spain, NW Spain, 1993	I. Bravo
<i>G. catenatum</i>	GC31AM	La Atunara, Cádiz, Spain, 1999	S. Fraga
<i>G. catenatum</i>	CS-302	Hastings Bay, Tasmania, Australia, 1990	
<i>G. impudicum</i> (Fraga et Bravo) Hansen et Moestrup	GY1VA	Valencia, Mediterranean Sea, 1992	I. Bravo
<i>G. instriatum</i> (Freudenthal et Lee) Coats	VGO642	Vilanova, Barcelona, Mediterranean Sea, 2003	S. Fraga
<i>G. litoralis</i> René			
<i>G. cf. microreticulatum</i> Bolch et Hallegraeff	VGO581	La Fosca, Girona, Mediterranean Sea, 2002	S. Fraga
<i>G. nolleri</i> Ellegaard et Moestrup	DK5	Øresund, Denmark, Atlantic Ocean, 1998	M. Ellegaard
<i>Gyrodinium uncatenum</i> Hulburt	CS-289/3	Bathurst Harbor, Tasmania, Australia, 1988	S. Blackburn
<i>Karenia brevis</i> (Davis) Hansen et Moestrup	CCMP718	Florida, USA, North Atlantic Ocean, 1960	W. B. Wilson
<i>K. brevis</i>	CCMP2281	Pensacola Beach, FL, USA, North Atlantic, 2003	J. Rogers
<i>K. mikimotoi</i> (Miyake et Kominami ex Oda) Hansen et Moestrup	CCMP429	Sutton Harbour, Plymouth, UK, Atlantic Ocean, 1980	D. Harbor
<i>K. papilonacea</i> Haywood et Steidinger	VGO679	Sant Cast, Brittany, Atlantic Ocean, 2003	S. Fraga
<i>K. selliformis</i> Haywood, Steidinger et MacKenzie	VGO876	Boughrara, Tunisia, Mediterranean Sea, 2006	S. Fraga
<i>K. selliformis</i>	VGO877	Boughrara, Tunisia, Mediterranean Sea, 2006	S. Fraga
<i>K. selliformis</i>	VGO901	Boughrara, Tunisia, Mediterranean Sea, 2006	S. Fraga
<i>K. umbella</i> de Salas, Bolch et Hallegraeff	Gy2DE	Derwent River, Tasmania, Australia, 1997	C. Bolch
<i>Karlodinium armiger</i> Bergholtz, Daugberg et Moestrup	GC-2 IRTA	Alfacs Bay, Ebro Delta, Mediterranean Sea, 2000	M. Fernández
<i>K. armiger</i>	GC-3 IRTA	Alfacs Bay, Ebro Delta, Mediterranean Sea, 2000	M. Fernández
<i>K. armiger</i>	VGO260	Delta del Ebro, Tarragona, Mediterranean Sea, na	M. Delgado
<i>K. decipiens</i> de Salas, Bolch et Hallegraeff	Nervi34	Nervi34 Estuary, Biscay Bay, 2004	A. Laza-Martinez
<i>K. veneficum</i> (Ballantine) Larsen	CCMP415	59.3° N, 10.36° E, Norway, Atlantic Ocean, 1976	W. Thomas
<i>K. veneficum</i>	CCMP1974	Chesapeake Bay, USA, Atlantic Ocean, 1995	L. Aishao
<i>K. veneficum</i>	CS-310	Illawarra Lake, NSW, Australia, na	C. Bolch
<i>K. veneficum</i>	GC-4 IRTA	Alfacs Bay, Ebro Delta, Mediterranean Sea, 2000	M. Fernández
<i>K. veneficum</i>	VGO691	Bretagne, France, Atlantic Ocean, 2003	S. Fraga
<i>K. veneficum</i>	VGO870	Boughrara, Tunes, Mediterranean Sea, 2006	S. Fraga
<i>Lepidodinium chlorophorum</i> (Elbrächter et Schnepf) Hansen, Botes et de Salas	BAHME100	List / Sylt 55° 01.30' N, 08° 27.10' E, 1990	M. Elbrächter
<i>L. chlorophorum</i>	Dino16EUH	Nervion River, Biscay Bay, Atlantic Ocean, 2003	A. Laza-Martinez

<i>L. chlorophorum</i>	RCC1488	English Channel, Normandy Coast, Atlantic Ocean, year unknown	I. Probert
<i>L. chlorophorum</i>	RCC1489	English Channel, Normandy Coast, Atlantic Ocean, year unknown	I. Probert
<i>Takayama cf. helix</i> de Salas, Bolch et Hallegraeff	VGO 341	Ría de Vigo, NW Spain, 2001	S. Fraga
PERIDINIALES			
<i>Durinskia baltica</i> (= <i>Peridinium balticum</i> Levis) Lemm	CS-38	Salton Sea, CA, USA, na	A. Loeblich
<i>Heterocapsa niei</i> (Loeblich III, 1968) Morrill & Loeblich III	VGO399	Ría de Lorbé, NW Spain, 2002	S. Fraga
<i>H. triquetra</i> (Ehrenberg) Stein	VGO1053	Bahía de Fangar, Ebro Delta, Mediterranean Sea, 2005	I. Bravo
<i>Kryptoperidinium foliaceum</i> (Stein) Lindemann	CS-37	La Parguera, Puerto Rico, Atlantic Ocean, 1965	P. R. Burkholder
<i>K. foliaceum</i>	VGO556	Catoira, Ría de Arousa, NW Spain, 2002	F. Rodríguez
<i>Peridinium aciculiferum</i> Lemmermann	PAER-1	Lake Erken, Sweden, 1995	K. Rengefors
<i>P. aciculiferum</i>	PAER-2	Lake Erken, Sweden, 2004	K. Rengefors
<i>Scrippsiella hangoei</i> (Schiller) Larsen	STHV-1	Baltic Sea, near Tvarminne, Finland, 2002	A. Kremp
<i>S. hangoei</i>	STHV-4	Baltic Sea, near Tvarminne, Finland, 2002	A. Kremp
<i>S. hangoei</i>	STHV-6	Baltic Sea, near Tvarminne, Finland, 2002	A. Kremp
<i>Scrippsiella</i> sp.	S3V	Ría de Vigo, NW Spain, 1989	S. Fraga
PROROCENTRALES			
<i>Prorocentrum arenarium</i> Faust	VGO776	Tenerife, Canary Islands, Spain, 2004	S. Fraga
<i>P. belizeanum</i> Faust	PBMA01	Mayotte Island, Indian Ocean, 1992	J. Diogène
<i>P. belizeanum</i>	VGO867	La Gomera, Canary Islands, Spain, 2005	S. Fraga
<i>P. compressum</i> (Bailey) Abé ex Dodge	VGO621	Greece, Mediterranean Sea, 2002	S. Fraga
<i>P. cf. faustiae</i> Morton	VGO894	Malaysia, na	N. Noor
<i>P. levis</i> Faust, Kibler, Vandersea, Tester et Litaker	VGO777	Tenerife, Canary Islands, Spain, 2004	S. Fraga
<i>P. levis</i>	VGO957	Ebro Delta, Mediterranean Sea, na	J. Diogène
<i>P. lima</i> (Ehrenberg) Dodge	PL2V	Isl. Cies, Ría de Vigo, NW Spain, 1985	I. Bravo
<i>P. lima</i>	VGO620	Torre Mora, Spain, Mediterranean Sea, 2002	S. Fraga
<i>P. micans</i> Ehrenberg	PM1V	Ría de Vigo, NW Spain, 1985	I. Bravo
<i>P. minimum</i> (Pavillard) Schliller	VGO365	Ría de Vigo, NW Spain, 2001	S. Fraga
<i>P. minimum</i>	VGO367	Ría de Vigo, NW Spain, 2001	S. Fraga
<i>P. nux</i> Puigserver et Zingone	UTEX1008	England, North Sea, Atlantic Ocean, 1957	I. Adams
<i>P. rathymum</i> Loeblich, Shirley et Schmidt	VGO893	Malaysia, na	Norma
<i>P. rostratum</i> Stein	PR1V	Ría de Vigo, NW Spain, 1990	I. Bravo
<i>P. triestinum</i> Schliller	PT2V	Ría de Vigo, NW Spain, 1989	S. Fraga
THORACOSPHAERALES			
<i>Thoracosphaera heimii</i> (Lohm.) Kamptner	CCMP1069	23° 48.9' N, 89° 45.7' W, Gulf of Mexico, 1989	L. Brand

Table S2. Mass (w:w) pigment to chlorophyll (chl) *a* ratios and their variability in pigment-based chloroplast Type 1. Abbreviations as in Table 1 of the main text

Order and species	Strain code	Peri:chl <i>c</i> ₂	Peri:chl <i>a</i>	Chl <i>c</i> ₂ :chl <i>a</i>	Chl <i>c</i> ₁ :chl <i>a</i>	Diadino:chl <i>a</i>	Dino:chl <i>a</i>
GONYAULACALES							
<i>Alexandrium affine</i>	PA2V	4.23	0.76	0.18	0.00	0.34	0.16
<i>A. andersonii</i>	CCMP1718	3.48	0.80	0.23	0.00	0.39	0.12
<i>A. andersonii</i>	VGO664	4.64	0.98	0.21	0.00	0.42	0.06
<i>A. andersonii</i>	SZN-12	3.30	0.43	0.13	0.00	0.27	0.13
<i>A. catenella</i>	AT02	3.16	0.60	0.19	0.00	0.41	0.17
<i>A. catenella</i>	VGO609	3.11	0.59	0.19	0.00	0.28	0.28
<i>A. catenella</i>	AL96	3.00	0.45	0.15	0.00	0.18	0.10
<i>A. insuetum</i>	ICMB218	3.27	0.72	0.22	0.00	0.25	0.08
<i>A. margalefii</i>	ICMB	3.59	0.78	0.22	0.00	0.27	0.10
<i>A. margalefii</i>	VGO661	3.05	0.64	0.21	0.00	0.20	0.11
<i>A. minutum</i>	AL1V	5.23	0.95	0.18	0.00	0.26	0.12
<i>A. minutum</i>	AMAD01	3.43	0.96	0.28	0.00	0.30	0.12
<i>A. minutum</i>	CLONE4	2.78	0.76	0.27	0.00	0.28	0.14
<i>A. minutum</i>	VGO577	3.25	0.78	0.24	0.00	0.31	0.12
<i>A. ostenfeldii</i>	AOTV-A1A	3.41	0.69	0.20	0.01	0.55	0.14
<i>A. ostenfeldii</i>	AOTV-A4A	3.15	0.63	0.20	0.01	0.52	0.12
<i>A. peruvianum</i>	AM10C	5.12	0.88	0.17	0.00	0.41	0.10
<i>A. pseudogonyaulax</i>	VGO706	3.53	0.90	0.26	0.00	0.18	0.05
<i>A. tamarense</i>	CCMP1493	3.36	0.67	0.20	0.00	0.26	0.12
<i>A. tamarense</i>	MDQ1096	3.42	0.80	0.23	0.00	0.33	0.13
<i>A. tamarense</i>	PE1V	2.91	0.67	0.23	0.00	0.25	0.12
<i>A. tamarense</i>	VGO553	3.72	0.78	0.21	0.00	0.29	0.12
<i>A. tamutum</i>	VGO617	3.42	0.85	0.25	0.00	0.38	0.12
<i>A. taylori</i>	AM8V	2.24	0.39	0.18	0.00	0.44	0.18
<i>A. taylori</i>	VGO703	2.44	0.44	0.18	0.00	0.24	0.17
<i>Coolia canariensis</i>	VGO775	4.26	1.10	0.26	0.00	0.41	0.11
<i>C. canariensis</i>	VGO787	4.14	1.45	0.35	0.00	0.37	0.09
<i>C. monotis</i>	CM2V	3.25	0.72	0.22	0.00	0.38	0.12
<i>C. monotis</i>	CM6V	3.12	0.78	0.25	0.00	0.42	0.12
<i>C. monotis</i>	RIKZ4	2.58	0.76	0.29	0.00	0.38	0.13
<i>C. monotis</i>	CCMP1345	2.75	0.81	0.29	0.00	0.31	0.14
<i>Coolia</i> sp.	VGO923	3.11	0.74	0.24	0.00	0.27	0.09
<i>C. tropicalis</i>	CCMP1744	2.31	0.80	0.35	0.05	0.39	0.12

<i>Fragilidium</i> sp.	VGO692	3.16	0.68	0.21	0.00	0.44	0.14
<i>Fragilidium</i> sp.	IO 91-01	2.94	0.73	0.25	0.00	0.34	0.14
<i>Gambierdiscus excentricus</i>	VGO790	3.51	1.07	0.31	0.04	0.40	0.14
<i>Gambierdiscus</i> sp.	VGO920	2.82	0.64	0.22	0.03	0.35	0.13
<i>Gambierdiscus</i> sp.	KC81G1	2.82	0.78	0.28	0.05	0.40	0.12
<i>Lingulodinium polyedrum</i>	LP4V	3.99	0.78	0.20	0.00	0.24	0.14
<i>L. polyedrium</i>	LP9V	4.27	0.78	0.18	0.00	0.24	0.14
<i>Neoceratium furca</i>	Nfurca1	2.91	0.51	0.18	0.00	0.25	0.01
<i>Ostreopsis ovata</i>	OS01BR	3.11	0.84	0.27	0.00	0.50	0.10
<i>O. cf. ovata</i>	VGO611	3.06	0.83	0.27	0.00	0.31	0.09
<i>O. cf. siamensis</i>	OS3V	3.54	1.01	0.29	0.00	0.66	0.09
<i>O. cf. siamensis</i>	VGO613	3.62	0.97	0.27	0.00	0.48	0.10
<i>O. cf. siamensis</i>	VGO883	3.47	0.86	0.25	0.00	0.39	0.10
<i>Protoceratium reticulatum</i>	GG1AM	2.94	0.72	0.25	0.01	0.26	0.12
<i>P. reticulatum</i>	CCMP404	4.02	0.66	0.16	0.03	0.40	0.14
<i>P. reticulatum</i>	CCMP1720	4.41	0.72	0.16	0.02	0.42	0.11
GYMNODINIALES							
<i>Akashiwo sanguinea</i>	VGO138	2.28	0.48	0.21	0.00	0.44	0.14
<i>A. sanguinea</i>	VGO626	3.01	0.53	0.17	0.00	0.27	0.14
<i>Amphidinium carterae</i>	A01BR	2.11	0.83	0.39	0.00	0.59	0.07
<i>A. carterae</i>	ACMK03	1.66	0.61	0.37	0.00	0.50	0.14
<i>A. carterae</i>	ACRN02	1.88	0.77	0.41	0.00	0.46	0.05
<i>A. cf. carterae</i>	A1V	2.37	0.66	0.28	0.00	0.37	0.06
<i>Barrufeta bravensis</i>	VGO859	1.92	0.43	0.23	0.00	0.49	0.13
<i>B. bravensis</i>	VGO860	2.00	0.56	0.28	0.00	0.53	0.30
<i>B. bravensis</i>	VGO864	1.99	0.38	0.20	0.00	0.58	0.23
<i>Gymnodinium catenatum</i>	GC11V	2.49	0.51	0.20	0.00	0.40	0.20
<i>G. catenatum</i>	GC31AM	2.00	0.41	0.20	0.00	0.33	0.20
<i>G. catenatum</i>	CS-302	1.91	0.58	0.30	0.00	0.42	0.17
<i>G. impudicum</i>	GY1VA	2.01	0.47	0.24	0.00	0.38	0.21
<i>G. instriatum</i>	VGO642	2.60	0.59	0.23	0.00	0.48	0.11
<i>G. cf. microreticulatum</i>	VGO581	2.00	0.42	0.20	0.01	0.36	0.14
<i>G. nolleri</i>	DK5	2.99	0.72	0.24	0.00	0.27	0.23
<i>Gyrodinium uncatenum</i>	CS289-3	2.63	0.50	0.19	0.28	0.49	0.09
PERIDINIALES							
<i>Heterocapsa niei</i>	VGO399	1.44	0.56	0.38	0.08	0.34	0.13
<i>H. triquetra</i>	VGO1053	1.45	0.49	0.34	0.00	0.48	0.12
<i>Peridinium aciculiferum</i>	PAER-1	2.71	0.57	0.21	0.10	0.28	0.07

<i>P. aciculiferum</i>	PAER-2	2.85	0.62	0.22	0.11	0.29	0.07
<i>Scrippsiella hangoei</i>	STHV-1	2.02	0.63	0.31	0.01	0.33	0.08
<i>S. hangoei</i>	STHV-2	2.01	0.65	0.31	0.01	0.35	0.07
<i>S. hangoei</i>	STHV-5	2.11	0.57	0.26	0.01	0.29	0.06
<i>S. hangoei</i>	STHV-6	2.03	0.60	0.29	0.02	0.34	0.08
<i>Scrippsiella</i> sp.	S3V	5.04	0.83	0.16	0.00	0.35	0.07
PROROCENTRALES							
<i>Prorocentrum arenarium</i>	VGO776	7.43	0.67	0.09	0.02	0.38	0.19
<i>P. belizeanum</i>	PBMA01	19.80	1.16	0.06	0.00	0.52	0.18
<i>P. belizeanum</i>	VGO867	25.42	1.01	0.04	0.01	0.49	0.16
<i>P. compressum</i>	VGO621	4.75	0.83	0.18	0.00	0.29	0.09
<i>P. cf. faustiae</i>	VGO894	7.39	0.82	0.11	0.00	0.33	0.19
<i>P. levis</i>	VGO777	40.32	0.85	0.02	0.01	0.40	0.17
<i>P. levis</i>	VGO957	15.58	0.68	0.05	0.00	0.40	0.22
<i>P. lima</i>	PL2V	12.08	1.09	0.09	0.00	0.71	0.22
<i>P. cf. lima</i>	VGO620	3.81	0.93	0.25	0.01	0.53	0.22
<i>P. micans</i>	PM1V	7.94	0.88	0.11	0.00	0.40	0.09
<i>P. minimum</i>	VGO365	4.75	0.85	0.18	0.00	0.35	0.05
<i>P. minimum</i>	VGO367	10.68	1.16	0.11	0.00	0.28	0.06
<i>P. nux</i>	UTEX1008	3.64	1.07	0.29	0.00	0.48	0.08
<i>P. rathymum</i>	VGO893	10.30	1.12	0.11	0.00	0.42	0.12
<i>P. rostratum</i>	PR1V	18.65	1.19	0.06	0.00	0.30	0.09
<i>P. triestinum</i>	PT2V	4.28	0.95	0.22	0.00	0.42	0.10
THORACOSPHAERALES							
<i>Thoracosphaera heimii</i>	CCMP1069	2.43	0.80	0.33	0.00	0.58	0.04
Mean		4.52	0.73	0.22	0.01	0.37	0.12
SD		5.39	0.23	0.08	0.03	0.12	0.05
N		90	90	90	21	90	90

Table S3. Mass pigment ratios (w:w, accessory chls:chl *a*) in pigment-based chloroplast Types 2 and 3. Abbreviations as in Table 1 of the main text

Chloroplast Type 2 Species and strain code	Chl <i>c</i> ₃ :chl <i>a</i>	Chl <i>c</i> ₂ :chl <i>a</i>	MGDG-chl <i>c</i> ₂ :chl <i>a</i> Peak 51	MGDG-chl <i>c</i> ₂ :chl <i>a</i> Peak 56	MGDG-chl <i>c</i> ₂ :chl <i>a</i> Peak 60	Chl <i>c</i> ₃ :chl <i>c</i> ₂	Σchl <i>c</i> :chl <i>a</i>
<i>Karenia brevis</i> CCMP718	0.05	0.08	0.00	0.01	0.00	0.62	0.14
<i>K. brevis</i> CCMP2281	0.05	0.10	0.00	0.01	0.00	0.50	0.16
<i>K. mikimotoi</i> CCMP429	0.06	0.11	0.00	0.00	0.00	0.50	0.17
<i>K. papilionacea</i> VGO679	0.04	0.09	0.00	0.01	0.00	0.47	0.13
<i>K. selliformis</i> VGO875	0.06	0.11	0.00	0.00	0.00	0.55	0.17
<i>K. umbella</i> Gy2DE	0.05	0.11	0.00	0.00	0.00	0.62	0.16
Chloroplast Type 3							
<i>Karlodinium armiger</i> GC-7	0.06	0.10	0.01	0.01	0.00	0.59	0.19
<i>K. decipiens</i> Nervión34	0.05	0.15	0.00	0.00	0.00	0.35	0.20
<i>K. veneficum</i> CCMP415	0.06	0.15	0.00	0.00	0.00	0.41	0.21
<i>K. veneficum</i> CCMP1974	0.06	0.15	0.00	0.00	0.00	0.38	0.21
<i>K. veneficum</i> CS-310	0.07	0.16	0.00	0.00	0.00	0.41	0.23
<i>K. veneficum</i> GC-4	0.04	0.12	0.00	0.00	0.00	0.31	0.17
<i>K. veneficum</i> VGO691	0.05	0.13	0.00	0.00	0.00	0.41	0.18
<i>K. veneficum</i> VGO870	0.05	0.14	0.00	0.00	0.00	0.33	0.19
<i>Takayama cf. helix</i> VGO341	0.05	0.14	0.01	0.02	0.01	0.35	0.23

Table S3 (cont.)

Chloroplast Type 2 Species and strain code	But-fuco like-1	But-fuco like-2	But- fuco	Fuco	4k-hex- fuco-like	4k-hex- fuco	Hex- fuco	GyrE1 -like	GyrE2 C12:0	GyrE3 C14:0
<i>Karenia brevis</i> CCMP718	0.03	0.06	0.07	0.25	0.04	0.10	0.06	0.00	0.10	0.00
<i>K. brevis</i> CCMP2281	0.05	0.05	0.07	0.18	0.08	0.09	0.08	0.00	0.13	0.00
<i>K. mikimotoi</i> CCMP429	0.06	0.06	0.08	0.24	0.10	0.10	0.08	0.02	0.10	0.00
<i>K. papilionacea</i> VGO679	0.02	0.03	0.11	0.10	0.08	0.08	0.25	0.03	0.16	0.01
<i>K. selliformis</i> VGO875	0.07	0.08	0.07	0.20	0.09	0.11	0.07	0.01	0.11	0.01
<i>K. umbella</i> Gy2DE	0.01	0.01	0.11	0.20	0.09	0.07	0.28	0.00	0.15	0.00
Chloroplast Type 3										
<i>Karlodinium armiger</i> GC-7	0.00	0.00	0.01	0.25	0.00	0.00	0.39	0.00	0.10	0.05
<i>K. decipiens</i> Nervión34	0.00	0.00	0.21	0.16	0.00	0.00	0.38	0.00	0.13	0.09
<i>K. veneficum</i> CCMP 415	0.00	0.00	0.11	0.41	0.00	0.00	0.27	0.00	0.23	0.02
<i>K. veneficum</i> CCMP 1974	0.00	0.00	0.13	0.32	0.00	0.00	0.24	0.00	0.15	0.09
<i>K. veneficum</i> CS-310	0.00	0.00	0.15	0.55	0.00	0.00	0.29	0.00	0.19	0.04
<i>K. veneficum</i> GC-4	0.00	0.00	0.07	0.53	0.00	0.00	0.18	0.00	0.18	0.04
<i>K. veneficum</i> VGO691	0.00	0.00	0.08	0.43	0.00	0.00	0.22	0.00	0.19	0.03
<i>K. veneficum</i> VGO870	0.00	0.00	0.16	0.22	0.00	0.00	0.34	0.00	0.19	0.02
<i>Takayama cf. helix</i> VGO341	0.00	0.00	0.00	0.87	0.00	0.00	0.05	0.00	0.00	0.00

Table S4. Mass pigment to chlorophyll (chl) *a* ratios (w:w) in pigment-based chloroplast Types 4, 5 and 6; tr.: trace amounts; other abbreviations as in Table 1 of the main text

Chloroplast Type 4	Chl <i>c</i> ₂	Chl <i>c</i> ₁ -like <i>Eg.</i>	MgDVP	Chl <i>c</i> ₁	Fuco	βψ-car		
<i>Peridinium balticum</i> CS-33	0.03	0.003	0.000	0.06	0.40	tr.		
<i>Kryptoperidinium foliaceum</i> CS-37	0.04	0.006	0.001	0.07	0.38	tr.		
<i>K. foliaceum</i> VGO556	0.05	0.007	0.003	0.08	0.55	0.03		
Chloroplast Type 5	Chl <i>c</i> ₂	Alloxanthin	Crocoxanthin	βε-car				
<i>Dinophysis acuminata</i> VGO1063	0.05	1.02	0.05	0.12				
<i>D. acuta</i> VGO1065	0.06	0.85	0.04	0.11				
<i>D. caudata</i> VGO1064	0.05	0.87	0.03	0.12				
<i>D. tripos</i> VGO1062	0.06	0.84	0.03	0.09				
Chloroplast Type 6	Neo	Viola	Anth	Zea	Unk443	βε-car	ββ-car	Chl <i>b</i>
<i>Lepidodinium chlorophorum</i> Dino16EUH	0.06	0.05	0.007	0.006	0.11	0.02	0.02	0.74
<i>L. chlorophorum</i> RCC1488	0.09	0.11	0.007	0.03	0.10	0.02	0.03	0.58
<i>L. chlorophorum</i> RCC1489	0.09	0.08	0.01	0.04	0.09	0.02	0.03	0.57
<i>L. chlorophorum</i> BAH100ME	0.06	0.22	0.02	0.01	0.12	0.07	0.03	0.08

Table S5. Species of *Karenia*, *Karlodinium* and *Takayama* described to date and the available pigment information

<i>Karenia</i> spp.	Species description	HPLC pigment data
<i>K. asterichroma</i>	de Salas et al. (2004b)	–
<i>K. bicuneiformis</i>	Botes et al. (2003)	–
<i>K. bidigitata</i>	Haywood et al. (2004)	–
<i>K. brevis</i>	(C.C. Davis) Hansen & Moestrup, in Daugbjerg et al. (2000)	Millie et al. (1997), Örnólfssdóttir et al. (2003)
<i>K. brevisulcata</i>	Chang & Ryan (2004)	–
<i>K. concordia</i>	Chang & Ryan (2004)	–
<i>K. cristata</i>	Botes et al. (2003)	–
<i>K. digitata</i>	Yang et al. (2000)	–
<i>K. longicanalis</i>	Yang et al. 2001	–
<i>K. mikimotoi</i>	(Miyake et Kominami ex Oda) Hansen & Moestrup, in Daugbjerg et al. (2000)	Suzuki & Ishimaru (1992), Johnsen & Sakshaug (1993), this study
<i>K. papilonaceae</i>	Haywood et al. (2004)	Laza-Martinez et al. (2007)
<i>K. selliformis</i>	Haywood et al. (2004)	This study
<i>K. umbella</i>	de Salas et al. (2004a)	de Salas et al. (2004a), this study
<i>Karlodinium</i> spp.		
<i>K. antarcticum</i>	de Salas et al. (2008)	–
<i>K. armiger</i>	Bergholtz et al. (2006)	Bergholtz et al. (2006), Garcés et al. (2006), this study
<i>K. australe</i>	de Salas et al. (2005)	de Salas et al. (2005)
<i>K. ballantinum</i>	de Salas et al. (2008)	–
<i>K. conicum</i>	de Salas et al. (2008)	–
<i>K. corrugatum</i>	de Salas et al. (2008)	–
<i>K. corsicum</i>	Siano et al. (2009)	–
<i>K. decipiens</i>	de Salas et al. (2008)	Laza-Martinez et al. (2007), this study
<i>K. veneficum</i>	(Ballantine) Larsen, in Daugbjerg et al. (2000)	Johnsen & Sakshaug (1993), Kempton et al. (2002), Bergholtz et al. (2006), Garcés et al. (2006), Bachvaroff et al. (2009), this study
<i>Takayama</i> spp.		
<i>T. acrotrocha</i>	Siano et al. (2009)	–
<i>T. cladochroma</i>	(Larsen) de Salas, Bolch & Hallegraeff, in de Salas et al. (2003)	–
<i>T. helix</i>	de Salas et al. (2003)	de Salas et al. (2003), this study
<i>T. tasmanica</i>	de Salas et al. (2003)	de Salas et al. (2003)
<i>T. tuberculata</i>	de Salas et al. (2008)	–
<i>T. pulchella</i>	Steidinger et al. (1998)	–

Table S6. Peridinin to chlorophyll (chl) *a* molar ratios used in CHEMTAX analysis of pigment data. Original data were in mass (w:w) ratios; here data are shown as molar ratios by multiplying the ratio of chl *a* MW (894) to MW of peridinin (631) = 1.42

Peridinin to chl <i>a</i> ratio (mole:mole)	Source
0.75	Mackey et al. (1996)
0.75	Wright et al. (1996)
0.86–1.42	Mackey et al. (1998)
0.61, 0.94	Schlüter et al. (2000)
1.51	Wright & van den Enden (2000)
0.71; 0.94	Descy et al. (2000)
0.77, 1.09	Suzuki et al. (2002)
1.51	Ishikawa et al. (2002)
0.85	DiTullio et al. (2003)
0.76	Örnólfssdóttir et al. (2003)
0.76	Rodríguez et al. (2003)
0.71	Buchaca et al. (2005)
1.51	Llewellyn et al. (2005)
1.12	Lewitus et al. (2005)
0.88	DiTullio et al. (2005)
0.56–0.65	Rodríguez et al. (2006)
0.52–0.88	Schlüter et al. (2006)
0.60	Eker-Develi et al. (2008)
1.10	Lionard et al. (2008)
0.92	Wright et al. (2009)
1.16	Wright et al. (2010)
0.59–0.63	Lauridsen et al. (2011)
0.56–0.62	Laviale & Neveux (2011)
0.50–0.89	Ruivo et al. (2011)
0.99–1.06	Schlüter et al. (2011)
0.75	Suzuki et al. (2011)

Table S7. Pigment-based chloroplast types in Dinophyceae and their distribution in other algal taxa

Dinophyceae chloroplast type	Representative species	Algal taxa with similar pigment-based chloroplast	Representative species
Type 1	<i>Alexandrium minutum</i>	–	–
Type 2	<i>Karenia mikimotoi</i>	–	–
Type 3	<i>Karlodinium veneficum</i>	Haptophyta Type-8 ^a	<i>Phaeocystis</i> spp.?
Type 4	<i>Durinskia baltica</i> , <i>Kryptoperidinium foliaceum</i>	Bacillariophyceae/ Haptophyta-Type 2 ^a	<i>Pseudo-nitzschia australis</i> / <i>Pavlova gyrans</i>
Type 5	<i>Dinophysis acuminata</i>	Cryptophyceae	<i>Teleaulax</i> spp.
Type 6	<i>Lepidodinium chlorophorum</i>	Chlorophyceae/Ulvophyceae Trebouxiophyceae	–

^aHaptophyte pigment types as defined in Zapata et al. (2004)

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