

Table S1. Strains used in this study.

strain	species	origin (references)
GONIACEAE		
SAG 175.80	<i>Astrephomene gubernaculifera</i>	USA, California, San Joaquin Valley, soil
NIES 418	<i>Astrephomene gubernaculifera</i>	Japan, Kanagawa, Kaisei, Yoshidajima, paddy soil (Nozaki 1983)
NIES 564	<i>Astrephomene perforata</i>	Japan, Kanagawa, Hayama, paddy soil (Nozaki 1983)
CCAP 32/29	<i>Gonium pectorale</i>	South Africa, Krüger Park, soil (Fabry et al. 1999)
CCAP 32/30	<i>Gonium pectorale</i>	USA, Alaska, Fairbanks, soil (Fabry et al. 1999)
CCAC 0085	<i>Gonium pectorale</i>	Germany, Münster, castle moat in the park of Burg Hülshoff, squeezed material
CCAC 0791	<i>Gonium pectorale</i>	Germany, Biebergemünd-Bieber, Forschungsinstitut Senckenberg, pond near Lochmühle
SAG 12.85	<i>Gonium pectorale</i>	Germany, Göttingen, pond in the Botanical Garden of the university
SAG 13.85	<i>Gonium pectorale</i>	Germany, Göttingen, pond in the Botanical Garden of the university
SAG 32-6	<i>Gonium quadratum</i>	Italy, South Tyrol, Klausen, garden soil (Pringsheim 1959, Nozaki 1990)
CHLAMYDOMONAS		
SAG 7.73	<i>Chlamydomonas incerta</i>	Cuba, Habana, basin in Jardin Zoologico
SAG 81.72	<i>Chlamydomonas incerta</i>	Netherlands, bog pool in nature preserve Hartertse Venen (Kroes 1971)
NIES 2462	<i>Chlamydomonas incerta</i>	Japan, Yamagata, Tsuruoka, Fujisawa, soil of a bamboo grove (Nakada et al. 2010)
SAG 11-32a ⁽¹⁾ = UTEX 89 ⁽²⁾ = CCAP 11/32B ⁽³⁾	<i>Chlamydomonas reinhardtii</i>	USA, Massachusetts, soil from potato field near Amherst (Hoshaw 1965)
SAG 11-32b ⁽⁴⁾ = UTEX 90 ⁽⁵⁾ = CCAP 11/32A ⁽⁶⁾	<i>Chlamydomonas reinhardtii</i>	USA, Massachusetts, soil from potato field near Amherst (Hoshaw 1965)
SAG 54.72	<i>Chlamydomonas reinhardtii</i>	USA, Massachusetts, soil from tobacco land near South Deerfield (Hoshaw & Ettl 1966)
NIES 2463	<i>Chlamydomonas reinhardtii</i>	Japan, Kagoshima, Kirishima, Kokubumuke-cho, soil of a paddy field (Nakada et al. 2010)
NIES 2464	<i>Chlamydomonas reinhardtii</i>	Japan, Kagoshima, Kirishima, Kokubumuke-cho, soil of a paddy field (Nakada et al. 2010)
CC-1952	<i>Chlamydomonas reinhardtii</i>	USA, Minnesota, soil (Gross et al. 1988)
CC-2290	<i>Chlamydomonas reinhardtii</i>	USA, Minnesota, soil (Gross et al. 1988)
CC-2342	<i>Chlamydomonas reinhardtii</i>	USA, Pennsylvania, soil (Spanier et al. 1992)
CC-2343	<i>Chlamydomonas reinhardtii</i>	USA, Florida, soil (Spanier et al. 1992)
CC-2344	<i>Chlamydomonas reinhardtii</i>	USA, Pennsylvania, soil (Spanier et al. 1992)
CC-2931	<i>Chlamydomonas reinhardtii</i>	USA, North Carolina, garden soil (Pröschold et al. 2005)
CC-2932	<i>Chlamydomonas reinhardtii</i>	USA, North Carolina, garden soil (Pröschold et al. 2005)
CC-2935	<i>Chlamydomonas reinhardtii</i>	Canada, Quebec, soil (Sack et al. 1994)
CC-2936	<i>Chlamydomonas reinhardtii</i>	Canada, Quebec, soil (Sack et al. 1994)
CC-2937	<i>Chlamydomonas reinhardtii</i>	Canada, Quebec, soil (Sack et al. 1994)
CC-2938	<i>Chlamydomonas reinhardtii</i>	Canada, Quebec, soil (Sack et al. 1994)
CC-3268	<i>Chlamydomonas reinhardtii</i>	USA, North Carolina, garden soil
NIVA CHL13	<i>Chlamydomonas reinhardtii</i>	unknown
SAG 2484	<i>Chlamydomonas schloesseri</i>	Kenya, Lake Nakuru National Park, Rhinopool, soil from the shore of a small dam
SAG 2485	<i>Chlamydomonas schloesseri</i>	Kenya, Lake Nakuru National Park, Rhinopool, soil from the shore of a small dam
SAG 2486	<i>Chlamydomonas schloesseri</i>	Kenya, Lake Nakuru National Park, Rhinopool, soil from the shore of a small dam

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strain	species	origin (references)
EDAPHOCHLAMYS		
SAG 14.93	<i>Edaphochlamys debaryana</i>	Germany, Göttingen, pond in the Botanical Garden of the university
SAG 46.86	<i>Edaphochlamys debaryana</i>	Germany, Göttingen, Botanical Garden of the university, basin in the greenhouse
SAG 11-1	<i>Edaphochlamys debaryana</i>	Czech Republic, Bohemia, pool near Großteich (Máchovo jezero), Hirschberg (Doksy)
SAG 4.72	<i>Edaphochlamys debaryana</i>	Japan, Kobe
SAG 15.72	<i>Edaphochlamys debaryana</i>	Czech Republic, Nordmähren, soil from beech forest (Ettl 1965)
SAG 26.72	<i>Edaphochlamys debaryana</i>	Japan, Kobe
SAG 22.79	<i>Edaphochlamys debaryana</i>	Thailand
SAG 11-55a	<i>Edaphochlamys debaryana</i>	Mexico, Chitmatma, soil from cornfield near Dolores
SAG 11-55b	<i>Edaphochlamys debaryana</i>	Mexico, Chitmatma, soil from cornfield near Dolores
SAG 14.72	<i>Edaphochlamys debaryana</i>	Mexico, Babicora Flats, soil
CCAP 11/130	<i>Edaphochlamys debaryana</i>	Germany, Göttingen, Botanical Garden of the university, basin in the greenhouse
SAG 6.79	<i>Edaphochlamys debaryana</i>	United States, Arizona, soil
SAG 7.79	<i>Edaphochlamys debaryana</i>	United States, Arizona, soil
TETRABAENACEAE		
CCAC 0145	<i>Basichlamys sacculiferum</i>	Germany, Eifel; bog (Heidemoor) near Dahlem
SAG 32-2a	<i>Tetrabaena socialis</i>	United Kingdom, pond in Cherry Hinton, Cambridge
SAG 32-2b	<i>Tetrabaena socialis</i>	United Kingdom, Jesus Creek in Jesus College, Cambridge
SAG 32-3	<i>Tetrabaena socialis</i>	Germany, Berlin, freshwater
CCAC 0033	<i>Tetrabaena socialis</i>	Germany, Bergisch-Gladbach, Diepeschrather Mühle
NIES 571	<i>Tetrabaena socialis</i>	Japan, Kanagawa, Yokohama, Kohoku-ku, pond sediment (Nozaki 1986)
VOLVOCEAE		
NIES 3388	<i>Colemanosphaera charkoviensis</i>	Japan, small pond near Lake Isanuma, Kawagoe-shi, Saitama (Nozaki et al. 2014)
NIES 725	<i>Eudorina peripherialis</i>	USA, Ohio, soil (Goldstein 1964, Yamada et al. 2008)
SAG 60-1c	<i>Pandorina morum</i>	United Kingdom, Lilley Pond in Clare College, Cambridge
CCAC 2817	<i>Pandorina morum</i>	Russia, freshwater, Vladivostok
NIES 728	<i>Platydorina caudata</i>	USA, Kansas, pond water
CCAC 2320	<i>Pleodorina indica</i>	Austria, Danubian backwater near Gießgang Greifenstein (Lower Austria)
UTEX 2804	<i>Pleodorina thompsonii</i>	USA, Texas, small muddy stream near College Park, south of College Station (Nozaki et al. 2006)
UTEX 2712	<i>Volvox capensis</i>	South Africa, near Kimberley, soil (Starr et al. 1980)
UTEX 1885	<i>Volvox carteri</i>	Japan, Kobe (Starr 1969)
NIES 867	<i>Volvox gigas</i>	South Africa
SAG 199.80	<i>Volvox globator</i>	USA, Massachusetts, freshwater pond, Woods Hole
CCAC 2662	<i>Volvox globator</i>	Austria, Swamp, proving ground, Biocenter, Vienna (Biocenter)
NIES 544	<i>Volvox tertius</i>	Japan, Kisofukushima, Nagano, paddy water
SAG 90-1	<i>Volvulina steinii</i>	South Africa, soil from De Klip, Cape Province
NIES 666	<i>Yamagishiella unicocca</i>	Japan, Nobi Kanagawa, pond water

Table S1. Strains used in this study.

strain	species	origin (references)
Others		
SAG 70.81	<i>'Chlamydomonas' cf. latifrons</i>	Czech Republic, Brno
SAG 11-10	<i>Vitreochlamys nekrassovii</i>	Czech Republic, shore of River Elbe near Celakovice
UTEX 167	<i>Paulschulzia pseudovolvox</i>	Finland, Tvärminne

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Table S1. Strains used in this study.

strain	accession # SSU	accession # ITS	accession # rbcL
GONIACEAE			
SAG 175.80	MF677991	MF677991	-
NIES 418	LC086347	U66937	D63428
NIES 564	LC086348	U66939	D63429
CCAP 32/29	MF677984	MF677984	MF687233
CCAP 32/30	MF677985	MF677985	MF687234
CCAC 0085	MF677986	MF677986	-
CCAC 0791	MF677987	MF677987	MG650070
SAG 12.85	MF677989	MF677989	MG650071
SAG 13.85	MF677990	MF677990	MG650072
SAG 32-6	MF677988	MF677988	-
CHLAMYDOMONAS			
SAG 7.73	MF678030	MF678030	MF687239
SAG 81.72	MF678031	MF678031	MF687240
NIES 2462	MF678032	MF678032	AB511848
SAG 11-32a ⁽¹⁾ = UTEX 89 ⁽²⁾ = CCAP 11/32B ⁽³⁾	MF678013 ⁽¹⁾ MF678015 ⁽²⁾ MF678012 ⁽³⁾	MF678013 ⁽¹⁾ MF678015 ⁽²⁾ MF678012 ⁽³⁾	MG650073 ⁽¹⁾ - ⁽²⁾ - ⁽³⁾
SAG 11-32b ⁽⁴⁾ = UTEX 90 ⁽⁵⁾ = CCAP 11/32A ⁽⁶⁾	MF678014 ⁽⁴⁾ MF678016 ⁽⁵⁾ MF678005 ⁽⁶⁾	MF678014 ⁽⁴⁾ MF678016 ⁽⁵⁾ MF678005 ⁽⁶⁾	MG650074 ⁽⁴⁾ AB511845 ⁽⁵⁾ - ⁽⁶⁾
SAG 54.72	MF678022	MF678022	MF687238
NIES 2463	MF678007	MF678007	AB511846
NIES 2464	MF678008	MF678008	MG650075
CC-1952	MF678009	MF678009	MF687241
CC-2290	MF678010	MF678010	MF687242
CC-2342	MF678023	MF678023	MF687243
CC-2343	MF678011	MF678011	MF687244
CC-2344	MF678006	MF678006	MF687245
CC-2931	MF678024	MF678024	MF687246
CC-2932	MF678025	MF678025	MF687247
CC-2935	MF678017	MF678017	MF687248
CC-2936	MF678018	MF678018	MF687249
CC-2937	MF678019	MF678019	MF687250
CC-2938	MF678020	MF678020	MF687251
CC-3268	MF678026	MF678026	MG650076
NIVA CHL13	MF678021	MF678021	MG650077
SAG 2484	MF678028	MF678028	MF687236
SAG 2485	MF678029	MF678029	MF687237
SAG 2486	MF678027	MF678027	MF687235

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strain	accession # SSU	accession # ITS	accession # rbcL
EDAPHOCHLAMYS			
SAG 14.93	MF677992	MF677992	MG650078
SAG 46.86	MF677993	MF677993	MG650079
SAG 11-1	MF677994	MF677994	MG650080
SAG 4.72	MF677995	MF677995	MG650081
SAG 15.72	MF677996	MF677996	MG650082
SAG 26.72	MF677997	MF677997	MG650083
SAG 22.79	MF677998	MF677998	MG650084
SAG 11-55a	MF677999	MF677999	MG650085
SAG 11-55b	MF678000	MF678000	MG650086
SAG 14.72	MF678001	MF678001	MG650087
CCAP 11/130	MF678002	MF678002	-
SAG 6.79	MF678003	MF678003	MG650088
SAG 7.79	MF678004	MF678004	MG650089
TETRABAENACEAE			
CCAC 0145	MF678037	MF678037	MG650094
SAG 32-2a	MF678033	MF678033	MG650090
SAG 32-2b	MF678034	MF678034	MG650091
SAG 32-3	MF678035	MF678035	MG650092
CCAC 0033	MF678036	MF678036	MG650093
NIES 571	LC086361	U66977	D63443
VOLVOACEAE			
NIES 3388	LC086350		AB905591
NIES 725	LC086354	AF486525	D63434
SAG 60-1c	MG650096	MG650096	-
CCAC 2817	MG650097	MG650097	-
NIES 728	LC086357	HG422794	D86828
CCAC 2320	MG650098	MG650098	-
UTEX 2804	LC086360	AF486540	AB214408
UTEX 2712	MG650099	MG650099	-
UTEX 1885	X53904	HG422807	AB076099
NIES 867	LC086363	HG422814	AB076084
SAG 199.80	MG650100	MG650100	D86836
CCAC 2662	MG650101	MG650101	-
NIES 544	LC086364	AB592344	AB076098
SAG 90-1	MG650102	MG650102	MG650095
NIES 666	LC086367	HG422775	D86823

Table S1. Strains used in this study.

strain	accession # SSU	accession # ITS	accession # rbcL
Others			
SAG 70.81	MF678038	MF678038	-
SAG 11-10	MG650103	MG650103	AB050494
UTEX 167	AF408246	AF182428	D86837