

Supplementary Information

Gains and losses of metabolic function inferred from a phylotranscriptomic analysis of algae

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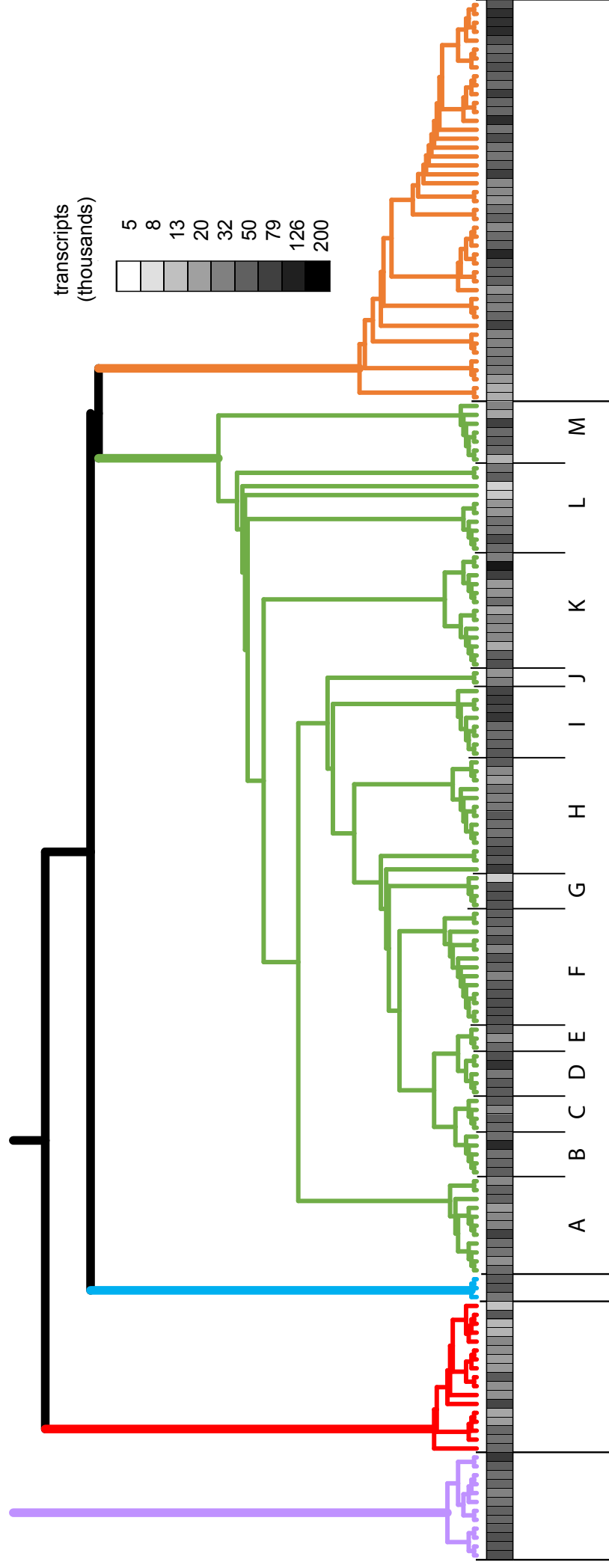
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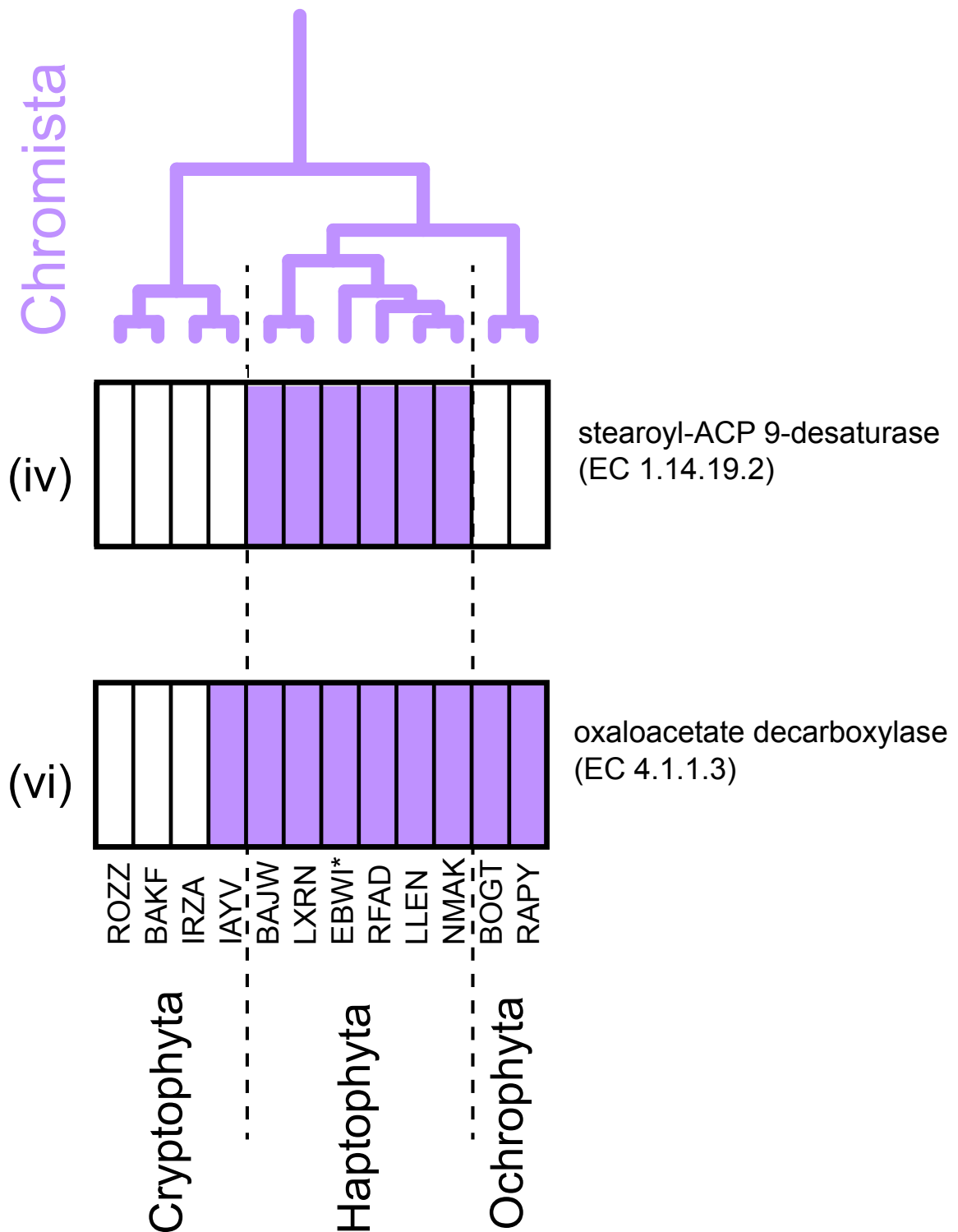
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Supplementary Figure S1

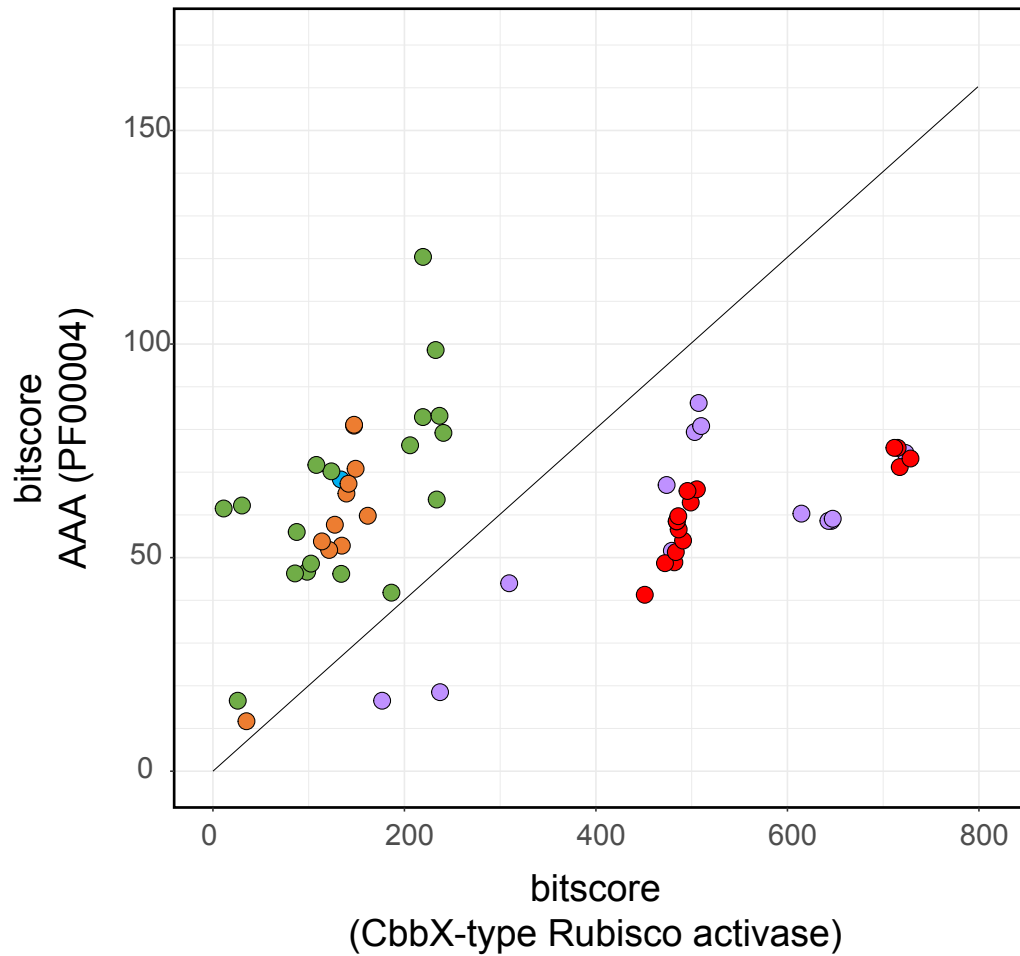


Supp Figure 1: Phylogenetic tree with transcript numbers and chlorophyte cluster labels. The number of transcript scaffolds assembled for each of the samples in the tree is indicated in the heatmap. Long vertical lines below the heatmap demarcate the five major clades. Shorter lines demarcate the 13 clusters of Chlorophyta defined as described in Methods. Clusters are labeled A-M.

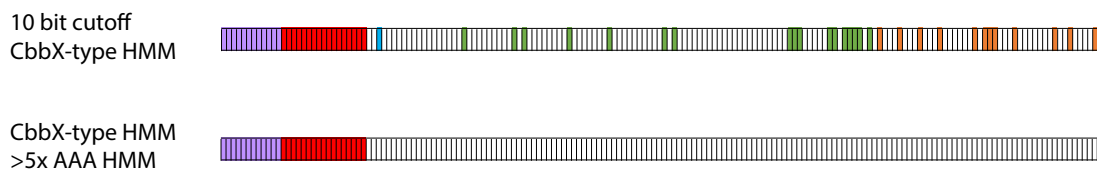


Supp Figure S2: This is essentially a close-up of the Chromista region from Fig 1A in the paper, and Fig 1B, HMMs iv and vi. This closeup provides the OneKP codes for the 12 chromista samples. Dashed lines help distinguish the three main clades as defined by the tree. These clades correspond very closely to the traditional taxonomic classification, given by the labels at the bottom. (There is only one sample - EBWI, indicated by an asterisk - whose placement is suspect). Note that all six samples that have hits to EC 1.14.19.2 (a fatty acid desaturase) are in the clade labeled as Haptophyta; conversely all of the samples in the clade have the sequence. Oxaloacetate decarboxylase is absent in only three of the twelve Chromista, but all three of the samples in which it is missing are cryptophytes.

A



B



Supp Figure S3: Alternative criteria for defining the presence of CbbX-type Rubisco activase sequences. (A) Plot of all samples for which a hit was found to an HMM for CbbX-type Rubisco activase at a threshold of 10 bits. The y-axis value is the bit-score for the same scaffold run against the Pfam HMM PF00004 (AAA). Samples are color coded in the same way as figures in the manuscript: purple are Chromista; red are rhodophytes; green are chlorophytes; and orange are streptophyte algae. The diagonal line has an intercept of 0 and a slope of 0.2; points to the right of this line have bitscores for CbbX-type Rubisco activase that are at least 5x higher than for the AAA HMM. (B) Representation of CbbX-type positive samples based on only the 10 bit threshold criterion (top) and for the criterion used in the paper, which is the same 10 bit threshold, plus a bitscore for CbbX-type HMM at least 5-fold higher than for the AAA HMM.

Supplementary Table S1

Data in columns A-I were downloaded from http://www.onekp.com/samples/list.php .								additional annotations						
1Kp Sample [sample codes]	Clade	Order	Family	Species	Tissue Type	Voucher Data [culture collection strain names]	Sample Provider	Notes [appended to bottom]	order (left to right) in tree figs	#scaffolds in assembly	Chlorophyte class (based on Algaebase)	Chlorophyte cluster (see Methods, fig S1)	prasinophytes	
ROZZ	Chromista (Algae)	Pyrenomonadales	Chroomonadaceae	Chroomonas sp.	algal cells	M1312	M. Melkonian		1	62685				
BAKF	Chromista (Algae)	Cryptomonadales	Cryptomonadaceae	Cryptomonas curvata	algal cells	CCAC 0006 (M0420)	M. Melkonian		2	56233				
IRZA	Chromista (Algae)	Pyrenomonadales	Geminigeraceae	Proteomonas sulcata	algal cells	CCMP 704	M. Melkonian		3	62109				
IAYV	Chromista (Algae)	Pyrenomonadales	Pyrenomonadaceae	Rhodomonas sp.	algal cells	M1630	M. Melkonian		4	51627				
BAIW	Chromista (Algae)	Isochrysidales	Isochrysidaceae	Isochrysis sp.	algal cells	CCAP 927/14	M. Melkonian		5	45228				
LXRN	Chromista (Algae)	Prymnesiales	Prymnesiaceae	Prymnesium parvum	algal cells	SAG 127.79	M. Melkonian		6	48769				
EBWI	Chromista (Algae)	Chromulinales	Chromulinaceae	Ochromonas sp.	algal cells	M1920	M. Melkonian		7	37616				
RFAD	Chromista (Algae)	Pavloviales	Pavloviaceae	Pavlova lutheri CCAC 0028	algal cells	CCAC 0028 (M1025)	M. Melkonian		8	30689				
LLEN	Chromista (Algae)	Pavloviales	Pavloviaceae	Pavlova lutheri SAG 926-1	algal cells	SAG 926-1	M. Melkonian		9	45335				
NMAK	Chromista (Algae)	Pavloviales	Pavloviaceae	Pavlova lutheri	cells grown on F/2	UTEX LB 1293	N. Clarke		10	38916				
BOGT	Chromista (Algae)	Synurales	Mallomonadaceae	Mallomonas sp.	algal cells	CCAC 0094	M. Melkonian		11	51201				
RAPY	Chromista (Algae)	Laminariales	Laminariaceae	Saccharina sculpera	blades	Tao Liu 201107019	Jun Yu		12	88085				
LLXI	Red Algae	Stylonematales	Stylonemataceae	Chroodactylon ornatum	algal cells	CCAP 1364/1	M. Melkonian		13	43085				
JJZR	Red Algae	Rhodochaetales	Rhodochaetaeaceae	Rhodochaete parvula	algal cells	SAG 8.99	M. Melkonian		14	37895				
RSOF	Red Algae	Glaucosphaerales	Glaucosphaeraceae	Glaucosphaera vacuolata	algal cells	SAG 13.82	M. Melkonian		15	43879				
PVGP	Red Algae	Porphyridiales	Porphyridiaceae	Porphyridium purpureum	algal cells	SAG 1380-1c	M. Melkonian		16	20562				
OBUY	Red Algae	Porphyridiales	Porphyridiaceae	Porphyridium cruentum	cells grown on F/2	UTEX 161	N. Clarke		17	18242				
ZULJ	Red Algae	Bangiales	Bangiaceae	Pyropia yezoensis	blades	Tao Liu 201104053	Jun Yu		18	72975				
XAXW	Red Algae	Ceramiales	Rhodomelaceae	Neosiphonia japonica	branches and blades	Tao Liu 201104042	Jun Yu		19	24378				
JEBK	Red Algae	Gigartinales	Solieriaceae	Eucluma denticulatum	branches	Tao Liu 201010021	Jun Yu		20	25026				
IHYU	Red Algae	Gigartinales	Solieriaceae	Kappaphycus alvarezii	branches	Tao Liu 201103110	Jun Yu		21	54853				
CXFX	Red Algae	Gigartinales	Phylloporaceae	Ahnfeltiopsis flabelliformis	branches and blades	Tao Liu 201108707	Jun Yu		22	21987				
SBLT	Red Algae	Gigartinales	Endocladaceae	Gloiopeltis furcata	branches and blades	Tao Liu 201104135	Jun Yu		23	20185				
UGPM	Red Algae	Gigartinales	Gigartineae	Chondrus crispus	blades	Tao Liu 201104049	Jun Yu		24	25527				
PYDB	Red Algae	Halymeniales	Halymeniaceae	Grateloupia catenata	branches and blades	Tao Liu 201108705	Jun Yu		25	28270				
URSB	Red Algae	Halymeniales	Halymeniaceae	Grateloupia turururu	blades	Tao Liu 201104125	Jun Yu		26	15114				
IKIZ	Red Algae	Halymeniales	Halymeniaceae	Grateloupia livida	blades	Tao Liu 201104057	Jun Yu		27	14255				
ZIOJ	Red Algae	Halymeniales	Halymeniaceae	Grateloupia filicina	branches and blades	Tao Liu 201104047	Jun Yu		28	56235				
FTRP	Red Algae	Gracilariales	Gracilariaceae	Gracilaria chouae	blades	Tao Liu 201104180	Jun Yu		29	12073				
QFND	Glaucophyta (Algae)	Glaucocystales	Glaucocystaceae	Cyanophora paradoxa CCAC 0074 (M1106/1)	algal cells	CCAC 0074 (M0763)	M. Melkonian		30	36658				
POOW	Glaucophyta (Algae)	Glaucocystales	Glaucocystaceae	Glaucocystis cf. nostochinearum	algal cells	CCAC 0088 (M1106/1)	M. Melkonian		31	58140				
POED	Glaucophyta (Algae)	Glaucocystales	Glaucocystaceae	Gloeochaete wittrockiana	algal cells	SAG 46.84	M. Melkonian		32	54785				
CBNG	Green Algae	Ultrichales	Borodiniaceae	Planophila laetevirens	algal cells	SAG 2008	M. Melkonian		33	41649	Ulvothyceae	A		
LETF	Green Algae	Ultrichales	Borodiniaceae	Planophila terrestris	algal cells	SAG 32.98	M. Melkonian		34	25194	Ulvothyceae	A		
AJAU	Green Algae	Chaetophorales	Chaetophoraceae	Helicodictyon planctonicum	algal cells	UTEX LB 1570	M. Melkonian		35	37626	Chlorophyceae	A		
JJWJ	Green Algae	Ultrichales	Ultrichaceae	Acrosiphonia sp.	algal cells	SAG 127.80	M. Melkonian		36	41151	Ulvothyceae	A		
COQP	Green Algae	Ulvales	Ulveae	Ochlochaete sp.	algal cells	CCMP 2390	M. Melkonian	1	37	77098	Ulvothyceae	A		
OAEZ	Green Algae	Ulvales	Ulveae	Percusaria percurva	algal cells	M1835	M. Melkonian		38	30043	Ulvothyceae	A		
NQYP	Green Algae	Chaetophorales	Chaetophoraceae	Pirula salina	algal cells	SAG 1.95	M. Melkonian		39	28302	Chlorophyceae	A		
GIJY	Green Algae	Sphaeropleales	Neochloridaceae	Neochloris sp.	algal cells	UTEX LB 1445	M. Melkonian		40	21703	Chlorophyceae	A		
KADG	Green Algae	Ultrichales	Ultrichaceae	Ignatius tetrasporus	algal cells	UTEX 2012	M. Melkonian		41	47187	Ulvothyceae	A		
VBHL	Green Algae	Cladophorales	Cladophoraceae	Cladophora glomerata	algal cells	CPCC 13	M. Melkonian		42	47161	Ulvothyceae	A		
YDCQ	Green Algae	Trentepohliales	Trentepohliaceae	Cephaleuros virescens	algal cells	SAG 28.93	M. Melkonian		43	27954	Ulvothyceae	A		
ZDIZ	Green Algae	Volvocales	Dunaliellaceae	Dunaliella tertiolecta	algal cells	CCMP 364	H. Sederoff		44	51322	Chlorophyceae	B		
WDWX	Green Algae	Volvocales	Dunaliellaceae	Dunaliella tertiolecta	algal cells	UTEX LB 1000	H. Sederoff	2	45	45761	Chlorophyceae	B		
RHVC	Green Algae	Volvocales	Dunaliellaceae	Dunaliella salina	algal cells	SAG 42.88	M. Melkonian		46	38926	Chlorophyceae	B		
UKUC	Green Algae	Volvocales	Dunaliellaceae	Dunaliella salina	algal cells	UTEX LB 200	H. Sederoff		47	109228	Chlorophyceae	B		
SYJM	Green Algae	Volvocales	Dunaliellaceae	Dunaliella viridis dumsi	algal cells	UTEX LB 1644	H. Sederoff	3	48	41020	Chlorophyceae	B		
QRTH	Green Algae	Volvocales	Chlamydomonadaceae	Chlorococcum microstigmatum	algal cells	SAG 11.43	M. Melkonian		4	49	43057	Chlorophyceae	C	
PRIQ	Green Algae	Pleurastrales	Pleurastraceae	Chlorococcum oleofaciens	algal cells	SAG 30.93	M. Melkonian		5	50289	Chlorophyceae	C		
ZLQE	Green Algae	Volvocales	Haematococcaceae	Stephanosphaera pluvialis	algal cells	SAG 78-1a	M. Melkonian		51	28849	Chlorophyceae	C		
GUBD	Green Algae	Volvocales	Chlamydomonadaceae	Brachiomonas submarina	algal cells	CCAC 0069 (M1823)	M. Melkonian		52	51744	Chlorophyceae	C		
MULF	Green Algae	Volvocales	Chlamydomonadaceae	Chlamydomonas bialatus	algal cells	SAG 7.72	M. Melkonian		53	53577	Chlorophyceae	D		
VALZ	Green Algae	Volvocales	Chlamydomonadaceae	Chlamydomonas noctigama	algal cells	SAG 36.72	M. Melkonian		54	54524	Chlorophyceae	D		
JRGJ	Green Algae	Volvocales	Chlamydomonadaceae	Chlamydomonas moewusii	algal cells	SAG 1.98	M. Melkonian		55	36079	Chlorophyceae	D		
GFUR	Green Algae	Volvocales	Chlamydomonadaceae	Chloromonas subdivisa	algal cells	SAG 67.72	M. Melkonian		56	95867	Chlorophyceae	D		
TSBQ	Green Algae	Volvocales	Chlamydomonadaceae	Chlamydomonas sp.	algal cells	M2762	M. Melkonian		57	61904	Chlorophyceae	D		
ACRY	Green Algae	Volvocales	Phacotaceae	Pteromonas sp.	algal cells	M2761	M. Melkonian		58	43687	Chlorophyceae	E		
LNIL	Green Algae	Volvocales	Phacotaceae	Pteromonas angulosa	algal cells	M2612	M. Melkonian		59	25461	Chlorophyceae	E		
ZIVZ	Green Algae	Volvocales	Phacotaceae	Phacotus lenticularis	algal cells	SAG 61-1	M. Melkonian		60	52103	Chlorophyceae	E		
WRSL	Green Algae	Volvocales	Volvoxaceae	Volvox aureus	algal cells	M2242	M. Melkonian		61	62468	Chlorophyceae	F		
JWGT	Green Algae	Volvocales	Volvoxaceae	Volvox aureus	algal cells	M1028	M. Melkonian		62	63713	Chlorophyceae	F		
RJXJ	Green Algae	Volvocales	Volvoxaceae	Pandorina morum	algal cells	CCAC 0063	M. Melkonian		63	64557	Chlorophyceae	F		
RNAT	Green Algae	Volvocales	Volvoxaceae	Eudorina elegans	algal cells	CCAC 0011	M. Melkonian		64	59712	Chlorophyceae	F		
ISPU	Green Algae	Volvocales	Volvoxaceae	Volvox globator	algal cells	ASW 05075	M. Melkonian		65	52127	Chlorophyceae	F		
IHOI	Green Algae	Volvocales	Chlamydomonadaceae	Chloromonas oogama	algal cells	SAG 9.79	M. Melkonian		66	30344	Chlorophyceae	F		
BCYF	Green Algae	Volvocales	Chlamydomonadaceae	Chlamydomonas cribrum	algal cells	SAG 13.72	M. Melkonian		67	47025	Chlorophyceae	F		
JKKI	Green Algae	Volvocales	Chlamydomonadaceae	Lobomonas rostrata	algal cells	SAG 45-1	E. Kazamia		68	58095	Chlorophyceae	F		
USIX	Green Algae	Chlorosarcinales	Chlorosarcinaceae	Neochlorosarcina sp.	clonal culture, veg	M 2315	M. Melkonian		69	30224	Chlorophyceae	F		
QWRA	Green Algae	Volvocales	Chlamydomonadaceae	Vitreochlamys sp.	algal cells	M2074	M. Melkonian		70	59097	Chlorophyceae	F		
IRYH	Green Algae	Volvocales	Chlamydomonadaceae	Heterochlamydomonas inaequalis	algal cells	SAG 4.75	M. Melkonian		71	37353	Chlorophyceae	F		
OFUE	Green Algae	Volvocales	Chlamydomonadaceae	Lobochlamys segnis	algal cells	SAG 50.84	M. Melkonian		72	47755	Chlorophyceae	F		
XDLL	Green Algae	Volvocales	Chlamydomonadaceae	Oogamochlamys gigantea	algal cells	SAG 44.91	M. Melkonian		73	50148	Chlorophyceae	F		
AJUU	Green Algae	Volvocales	Chlamydomonadaceae	Chloromonas rosae	algal cells	UTEX SNO 47	M. Melkonian		74	58510	Chlorophyceae	G		
LBRP	Green Algae	Volvocales	Chlamydomonadaceae	Chloromonas reticulata	algal cells	SAG 26.86	M. Melkonian		75	63012	Chlorophyceae	G		
AOUJ	Green Algae	Volvocales	Chlamydomonadaceae	Chlamydomonas sp.	algal cells	M2779	M. Melkonian		76	57048	Chlorophyceae	G		
UTRE	Green Algae	Volvocales	Chlamydomonadaceae	Chloromonas tughillensis	algal cells	UTEX SNO 88	M. Melkonian		77	10300	Chlorophyceae	G		
FXHG	Green Algae	Volvocales	Dunaliellaceae	Hafniomonas reticulata	algal cells	M0530/1	M. Melkonian		78	82903	Chlorophyceae	H		
RUIF	Green Algae	Volvocales	Carteriaceae	Carteria obtusa	algal cells	SAG 39.84	M. Melkonian		79	54689	Chlorophyceae	H		
VIAU	Green Algae	Volvocales	Carteriaceae	Carteria crucifera	algal cells	SAG 8-7a	M. Melkonian		80	64474	Chlorophyceae	H		
XTON	Green Algae	Chlorococcales	Hydrodictyaceae	Pediastrum duplex CCAC 0147	algal cells	CCAC 0147	M. Melkonian		81	50064	Chlorophyceae	H		
XKWQ	Green Algae	Chlorococcales	Hydrodictyaceae	Pediastrum duplex CCAC 0012	algal cells	CCAC 0012 (M0549)	M. Melkonian		82	38322	Chlorophyceae	H		
VIDZ	Green Algae	Trebouxiiales	Botryococcaceae	Botryococcus sudeticus	algal cells	UTEX 2629	N. Clarke		83	41539	Trebouxiophyceae	H		
PZIF	Green Algae	Chlorococcales	Scenedesmeceae	Scenedesmus dimorphus	cells grown on 3N	UTEX 746	N. Clarke		84	56356	Chlorophyceae	H		
MWAN	Green Algae	Chlorococcales	Chlorellaceae	Chlorella minutissima	cells grown on F/2	UTEX 2219	N. Clarke		85	36163	Trebouxiophyceae	H		
OTQG	Green Algae	Sphaeropleales	Ankistrodesmaceae	Ankistrodesmus sp.	algal cells	M3332	M. Melkonian		86	31799	Chlorophyceae	H		
BZSH	Green Algae	Chlorococcales	Golenkinaceae	Golenkinia longispicula	algal cells	SAG 73.80	M. Melkonian		87	37735	Chlorophyceae	H		
ENAU	Green Algae	Volvocales	Chlamydomonadaceae	Spermatozopsis similis	algal cells	CCAC 0013 (M0563/1)	M. Melkonian		88	21774	Chlorophyceae	H		
MXDS	Green Algae	Volvocales	Chlamydomonadaceae	Spermatozopsis exsultans	algal cells	M0562	M. Melkonian		89	27853	Chlorophyceae	H		
DZPJ	Green Algae	Ultrichales	Cylindrocapsaceae	Cylindrocapsa geminella	algal cells	SAG 3.87	M. Melkonian		90	54221	Ulvothyceae	H		
JMUI	Green Algae	Chaetophorales	Chaetophoraceae	Stigeoclonium helveticum	algal cells	SAG 477-1	M. Melkonian		91	56140	Chlorophyceae	I		
VFIV	Green Algae	Chaetophorales	Chaetophoraceae	Fritschiella tuberosa	algal cells	SAG 112.8	M. Melkonian		92	48720	Chlorophyceae	I		
ISGT	Green Algae	Chaetophorales	Chaetophoraceae	Uronema sp.	algal cells	CCAP 334/1	M. Melkonian	6	93	41559	Chlorophyceae	I		

RAWF	Green Algae	Chaetophorales	Chaetophoraceae	Uronema belkae	algal cells	SAG 34.86	M. Melkonian		94	43871	Chlorophyceae	I	
IJMT	Green Algae	Chaetophorales	Aphanochaetaceae	Aphanochaete repens	algal cells	M2226	M. Melkonian		95	92039	Chlorophyceae	I	
SDPC	Green Algae	Oedogoniales	Oedogoniaceae	Oedogonium foveolatum	algal cells	UTEX LB 933	M. Melkonian		96	71612	Chlorophyceae	I	
DVYE	Green Algae	Oedogoniales	Oedogoniaceae	Oedogonium cardiacum	algal cells	SAG 575-1a	M. Melkonian		97	80265	Chlorophyceae	I	
BAZF	Green Algae	Chaetopeltidales	Chaetopeltidaceae	Chaetopeltis orbicularis	algal cells	SAG 21.98	M. Melkonian		98	72685	Chlorophyceae	I	
JTIG	Green Algae	Bryopsidales	Bryopsidaceae	Bryopsis plumosa	algal cells	KU 272	M. Melkonian	7	99	33234	Ulvothycidae	J	
GYBH	Green Algae	Bryopsidales	Codiaceae	Codium fragile	algal cells	KU 654	M. Melkonian		100	23572	Ulvothycidae	J	
ETGN	Green Algae	Trebouxiiales	Botryococcaceae	Botryococcus braunii	cells grown on 3N	UTEX 2441	N. Clarke		101	62493	Trebouxiophyceae	K	
QXYX	Green Algae	Trebouxiiales	Botryococcaceae	Botryococcus terribilis	algal cells	ASW 05049	M. Melkonian		102	49754	Trebouxiophyceae	K	
GXBM	Green Algae	Chlorococcales	Coccomyxaaceae	Coccomyxa pringsheimii	algal cells	SAG 216-7	M. Melkonian		103	17042	Chlorophyceae	K	
NKXU	Green Algae	Trebouxiiales	Trebouxiaceae	Trebouxia arboricola	algal cells	SAG 219-1a	M. Melkonian		104	28139	Trebouxiophyceae	K	
ZNUM	Green Algae	Chlorellales	Leptosiraceae	Leptosira obovata	algal cells	SAG 445-1	M. Melkonian		105	26849	Trebouxiophyceae	K	
WXRI	Green Algae	Prasiolales	Prasiolaceae	Stichococcus bacillaris	algal cells	CCAC 0076 (M1897/1)	M. Melkonian		106	30268	Trebouxiophyceae	K	
WCLV	Green Algae	Prasiolales	Prasiolaceae	Prasiola crispa	algal cells	SAG 43.96	M. Melkonian		107	19130	Trebouxiophyceae	K	
EJJO	Green Algae	Volvocales	incertae sedis	Neochloris oleoabundans	cells grown on 3N	UTEX 1185	N. Clarke	8	108	40853	Chlorophyceae	K	
AKCR	Green Algae	Chlorellales	Chlorellaceae	Parachlorella kesslerii	algal cells	SAG 10.80	M. Melkonian		109	24207	Trebouxiophyceae	K	
BILC	Green Algae	Chlorellales	Chlorellaceae	Prototheca wickerhamii	algal cells	SAG 263-11	M. Melkonian		110	21751	Trebouxiophyceae	K	
JQFK	[Chromista (Algae)	[Eustigmatales]	[Monodopsidaceae]	Picochlorum atomus	cells grown on F/2	UTEX LB 1998	N. Clarke	9	111	80376	Trebouxiophyceae	K	
MNCB	Green Algae	Chlorellales	Oocystaceae	Eremosphaera viridis	algal cells	M0511b	M. Melkonian		112	37155	Trebouxiophyceae	K	
MFYC	Green Algae	Chlorellales	Chlorellaceae	Nannochloris atomus	algal cells	SAG 14.87	M. Melkonian		113	32696	Trebouxiophyceae	K	
HXXJ	Green Algae	Chlorodendrales	Chlorodendraceae	Tetraselmis striata	algal cells	PLY 443	M. Melkonian		114	42711	Chlorodendrophyceae	L	
HVNO	Green Algae	Chlorodendrales	Chlorodendraceae	Tetraselmis chui	cells grown on F/2	UTEX LB 232	N. Clarke		115	66049	Chlorodendrophyceae	L	
DUMA	Green Algae	Chlorodendrales	Chlorodendraceae	Tetraselmis cordiformis	algal cells	CCAC 0051 (M1608/1)	M. Melkonian		116	36828	Chlorodendrophyceae	L	
FMBV	Green Algae	Chlorodendrales	Chlorodendraceae	Scherffelia dubia	algal cells	CCAC 0019 (M0795)	M. Melkonian		117	38398	Chlorodendrophyceae	L	
PUAN	Green Algae	Pedinomonadales	Pedinomonadaceae	Pedinomonas tuberculata	algal cells	CCAC 1965/2	M. Melkonian		118	22957	Pedinophyceae	L	
RRSV	Green Algae	Pedinomonadales	Pedinomonadaceae	Pedinomonas minor	algal cells	SAG 1965-3	M. Melkonian		119	23185	Pedinophyceae	L	
AYPS	Green Algae	incertae sedis	incertae sedis	unidentified species	algal cells	CCMP 1205	M. Melkonian		120	11362		L	
TGNL	Green Algae	incertae sedis	incertae sedis	Picocystis salinarum	algal cells	CCMP 1897	M. Melkonian		121	9806		L	
MMKU	Green Algae	Nephroselmiales	Nephroselmidiaceae	Nephroselmis olivacea	algal cells	CCAC 0105	M. Melkonian		122	51161	Nephrophyceae	L	+
ISIM	Green Algae	Nephroselmiales	Nephroselmidiaceae	Nephroselmis pyriformis	algal cells	CCMP 717	M. Melkonian		123	37155	Nephrophyceae	L	+
MCPK	Green Algae	Mamiellales	Mamiellaceae	Bathycoccus prasinos	algal cells	SCCAP K-0417	M. Melkonian		124	15089	Mamiellophyceae	M	+
QX5Z	Green Algae	Mamiellales	Mamiellaceae	Mantiella squamata	algal cells	CCAP 1965/1	M. Melkonian		125	43084	Mamiellophyceae	M	+
BTFM	Green Algae	Mamiellales	Monomastixaceae	Monomastix opisthostigma	algal cells	CCAC 0206 (M2844/1)	M. Melkonian		126	51094	Mamiellophyceae	M	+
XOAL	Green Algae	Dolichomastigales	Dolichomastigaceae	Dolichomastix tenuilepis	algal cells	M1680	M. Melkonian		127	45061	Mamiellophyceae	M	+
TNAW	Green Algae	Pyramimonadales	Pyramimonadaceae	Pyramimonas parkeae	algal cells	CCAC 0082 (M1663/1)	M. Melkonian		128	78788	Pyramimonadophyceae	M	+
JMTE	Green Algae	Pseudoscurfieldiales	Pseudoscurfieldiaceae	Pseudoscurfieldia marina	algal cells	SCCAP K-0017	M. Melkonian		129	18581	Pyramimonadophyceae	M	+
EGNB	Green Algae	Scourfieldiales	Scourfieldiaceae	Scourfieldia sp.	algal cells	M0560/2	M. Melkonian		130	30256	Pedinophyceae	M	
HYHN	Green Algae	Prasinococcales	Prasinococcaceae	Prasinoderma coloniale	algal cells	CCMP 1413	M. Melkonian		131	16559			
XMCL	Green Algae	Prasinococcales	Prasinococcaceae	Prasinococcus capsulatus	algal cells	CCMP 1194	M. Melkonian		132	16474			
AZZW	Green Algae	Klebsormidiales	Klebsormidiaceae	Chlorokybus atmophyticus	clonal culture, veg	M 2923	M. Melkonian		133	21920			
NNHQ	Green Algae	Zygnematales	Mesotaeniaceae	Spirotaenia minuta	clonal culture, veg	M 2661	M. Melkonian		134	34193			
KYIO	Green Algae	Mesostigmatales	Mesostigmataceae	Mesostigma viride	clonal, axenic cult	SAG 50-1	M. Melkonian		135	37189			
FQLP	Green Algae	Klebsormidiales	Klebsormidiaceae	Klebsormidium subtile	clonal, axenic cult	M 1894/1 (CCAC 0119)	M. Melkonian		136	33647			
FPCC	Green Algae	Ulotrichales	Ulotrichaceae	Interfilum paradoxum	algal cells	SAG 338-1	M. Melkonian		137	30434			
BFIK	Green Algae	Klebsormidiales	Klebsormidiaceae	Entansia fimbriata	algal cells	UTEX LB 2353	M. Melkonian		138	31044			
MWXT	Green Algae	Charales	Characeae	Chara vulgaris	clonal culture, veg	M 3183	M. Melkonian		139	76087			
VOBJ	Green Algae	Coleochaetales	Coleochaetaceae	Coleochaete scutata	clonal, axenic cult	SAG 110.80M (M 1311)	M. Melkonian		140	45338			
QPDY	Green Algae	Coleochaetales	Coleochaetaceae	Coleochaete irregularis	algal cells	UTEX LB 2790	M. Melkonian		141	31619			
DRGY	Green Algae	Coleochaetales	Chaetosphaeriidae	Chaetosphaeridium globosum	clonal, axenic cult	M 1311 (CCAC 0044)	M. Melkonian		142	37188			
HAOX	Green Algae	Zygnematales	Zygnemataceae	Spirogyra sp.	clonal culture, veg	M 1810	M. Melkonian		143	25273			
WSJO	Green Algae	Zygnematales	Mesotaeniaceae	Mesotaenium braunii	algal cells	M2214	M. Melkonian		144	49049			
WDCW	Green Algae	Zygnematales	Mesotaeniaceae	Mesotaenium endlicherianum	algal cells	SAG 12.97	M. Melkonian		145	48633			
YOXI	Green Algae	Zygnematales	Mesotaeniaceae	Cylindrocystis brebissonii	algal cells	M2213	M. Melkonian		146	56995			
RPLG	Green Algae	Zygnematales	Mesotaeniaceae	Cylindrocystis brebissonii	algal cells	M2853	M. Melkonian		147	114760			
HKZW	Green Algae	Zygnematales	Mesotaeniaceae	Mesotaenium caldariorum	algal cells	SAG 648-1	M. Melkonian		148	48636			
JOJQ	Green Algae	Zygnematales	Zygnemataceae	Cylindrocystis cushleackae	algal cells	M2158	M. Melkonian		149	41982			
MFZO	Green Algae	Zygnematales	Zygnemataceae	Zygnemopsis sp.	algal cells	CCAP 699/1	M. Melkonian		150	27548			
FFGR	Green Algae	Zygnematales	Mesotaeniaceae	Netrium digitus	clonal, axenic cult	M 1322/1 (CCAC 0148)	M. Melkonian		151	47993			
KMNX	Green Algae	Zygnematales	Mesotaeniaceae	Nucleotaenium eifelense	algal cells	M3006	M. Melkonian		152	38154			
SNOX	Green Algae	Zygnematales	Mesotaeniaceae	Planotaenium ohtanii	algal cells	M 2697	M. Melkonian		153	24792			
XRTZ	Green Algae	Zygnematales	Mesotaeniaceae	Roya obtusa	algal cells	M2403	M. Melkonian		154	27653			
KEYW	Green Algae	Zygnematales	Gonatozygaceae	Gonatozygon kinahani	algal cells	M2935	M. Melkonian		155	28183			
DRFX	Green Algae	Zygnematales	Closteriaceae	Closterium lunula	algal cells	M2156	M. Melkonian		156	81203			
AEKF	Green Algae	Zygnematales	Peniaceae	Penium margaritaceum	algal cells	SAG 22.82	M. Melkonian		157	48819			
YSOT	Green Algae	Zygnematales	Peniaceae	Penium exiguum	algal cells	CCAC 0142 (M2159/1)	M. Melkonian		158	36931			
RPOV	Green Algae	Zygnematales	Desmidiaceae	Phymatodocis nordstedtiana	algal cells	SVCK 327	M. Melkonian		159	37309			
HIDG	Green Algae	Zygnematales	Desmidiaceae	Cosmarium broomei	clonal, axenic cult	M 2075/1 (CCAC 0143)	M. Melkonian	10	160	66229			
RQFE	Green Algae	Zygnematales	Desmidiaceae	Cosmocladium cf. constrictum	algal cells	ASW 07118 (M1361)	M. Melkonian		161	38344			
GYRP	Green Algae	Zygnematales	Desmidiaceae	Euastrum affine	algal cells	ASW 07012	M. Melkonian		162	104323			
MNNM	Green Algae	Zygnematales	Desmidiaceae	Cosmarium granatum	algal cells	CCAC 0137 (M2127/1)	M. Melkonian		163	44947			
ISHC	Green Algae	Zygnematales	Desmidiaceae	Staurastrum sebaldi	algal cells	M1129	M. Melkonian		164	46452			
QWVJ	Green Algae	Zygnematales	Desmidiaceae	Bambusina borrieri	algal cells	CCAC 0045 (M1320)	M. Melkonian		165	83393			
DFDS	Green Algae	Zygnematales	Desmidiaceae	Desmidium aptogonum	algal cells	ASW 07112	M. Melkonian		166	41347			
GGWH	Green Algae	Zygnematales	Desmidiaceae	Onychonema laeve	algal cells	CCAC 0151 (M2246/1)	M. Melkonian		167	49390			
WCQU	Green Algae	Zygnematales	Desmidiaceae	Staurodesmus convergens	algal cells	M2558	M. Melkonian		168	63206			
BHKB	Green Algae	Zygnematales	Desmidiaceae	Cosmarium tinctum	algal cells	M2301	M. Melkonian		169	51220			
RPRU	Green Algae	Zygnematales	Desmidiaceae	Staurodesmus omearii	algal cells	M0751	M. Melkonian		170	43362			
MCHJ	Green Algae	Zygnematales	Desmidiaceae	Micrasterias fimbriata	algal cells	ASW 07026 (M1188)	M. Melkonian		171	64972			
GBGT	Green Algae	Zygnematales	Desmidiaceae	Xanthidium antilopaeum	algal cells	M1229	M. Melkonian		172	105757			
MOYY	Green Algae	Zygnematales	Desmidiaceae	Pleurotaenium trabecula	algal cells	CCAC 0163	M. Melkonian		173	99058			
STKJ	Green Algae	Zygnematales	Desmidiaceae	Cosmarium ochthodes	algal cells	M1384	M. Melkonian		174	99850			
WDGV	Green Algae	Zygnematales	Desmidiaceae	Cosmarium submedium	algal cells	M3067	M. Melkonian		175	56528			
MXEZ	Green Algae	Pseudoscurfieldiales	Pycnococcaceae	Pycnococcus provasolii	algal cells	CCMP 1203	M. Melkonian		176	15322			
MJMQ	Chromista (Algae)	Pyrenomonadales	Chroomonadaceae	Hemiselmis virescens	algal cells	M1635	M. Melkonian		-	42834			
YTYU	Glaucochyta (Algae)	Glaucochytales	Glaucochytaeaceae	Cyanophora paradoxa CCAC 0091 (N	algal cells	CCAC 0091 M0507/1	M. Melkonian		-	34058			
DXNY	Green Algae	Microthamniales	Microthamniaceae	Microthamnia kuetzingiana	algal cells	CCAC 0054 (M0423)	M. Melkonian		-	43557			
AGIO	Green Algae	Volvocales	Haematococcaceae	Haematococcus pluvialis	algal cells	CCAC 0055 (M0716/1)	M. Melkonian		-	61126			
ODXI	Green Algae	Volvocales	Haematococcaceae	Haematococcus pluvialis	algal cells (red)	CCAC 0055	M. Melkonian		-	82149			
NTLE	Green Algae	Volvocales	Asteromonadaceae	Asteromonas gracilis	algal cells	CCAC 0049 (M1491)	M. Melkonian		-	53714			
HVMV	Green Algae	Zygnematales	Desmidiaceae	Cosmarium ochthodes	algal cells	ASW 07133	M. Melkonian		-	111788			

Notes from OneKP site:

- 1 weak RNA
- 2 originally submitted as D. primolecta, but appears to be identical to ZDIZ/CCMP 364
- 3 Originally submitted as UTEX LB 1644 D. salina, but the sequence was matched to S. viridis
- 4 was Chloromonas perforata (see doi:10.1111/jpy.12343)
- 5 was Pleurastrum insigne (see doi: 10.1111/jpy.12343)
- 6 originally recorded as Hormidiella sp.
- 7 weak RNA
- 8 was synonym Neochloris oleoabundans
- 9 was originally Nannochloropsis oculata
- 10 resent; few big contigs

Supp. Table 2:				-log(p-val) ³	
HMM name ¹	functional group ²	sub-group		5 major clades	most sig. Chlorophyte
ec2.7.1.19	carbon assimilation			0.3	1.6
ec4.1.1.39	carbon assimilation			0.1	0.5
ec4.1.2.13	carbon assimilation			0.0	0.8
ec5.1.3.1	carbon assimilation			0.0	0.0
ec5.3.1.6	carbon assimilation			0.1	1.2
PF00016	carbon assimilation			0.0	0.8
PF00101	carbon assimilation			0.2	0.5
PF00194	carbon assimilation			6.6	1.6
PF00484	carbon assimilation			11.3	1.0
PF02788	carbon assimilation			0.9	0.5
Rubisco_activase	carbon assimilation			33.0	0.0
ec1.1.1.157	central carbon			0.6	0.3
ec1.1.1.30	central carbon			0.0	0.0
ec1.1.1.37	central carbon			0.0	0.0
ec1.1.1.38	central carbon			0.0	0.8
ec1.1.1.40	central carbon			0.2	0.9
ec1.1.5.3	central carbon			0.3	0.9
ec1.2.1.12	central carbon			0.0	0.0
ec1.2.1.13	central carbon			0.4	0.0
ec1.2.1.9	central carbon			0.4	0.9
ec2.3.1.9	central carbon			0.0	0.9
ec2.3.3.1	central carbon			0.5	0.9
ec2.3.3.9	central carbon			11.4	6.3
ec2.7.2.3	central carbon			0.1	0.6
ec2.7.9.1	central carbon			0.8	4.0
ec3.1.3.11	central carbon			0.0	0.9
ec3.1.3.37	central carbon			0.6	0.9
ec4.1.1.3	central carbon			20.0	2.1
ec4.1.1.32	central carbon			6.9	0.8
ec4.1.1.49	central carbon			8.3	1.9
ec4.1.3.1	central carbon			8.9	6.3
ec5.3.1.1	central carbon			0.4	0.9
ec6.2.1.1	central carbon			0.0	0.6
ec6.4.1.3	central carbon			0.3	1.2
ec6.4.1.4	central carbon			0.0	0.9
oxoglutarate-malate transporter	central carbon			30.2	0.9
ec1.1.1.101	mebrane lipid	backbone		0.9	0.8
ec1.1.1.94	mebrane lipid	backbone		3.9	1.0
ec2.3.1.23	mebrane lipid	backbone		1.5	1.3
ec2.3.1.51	mebrane lipid	backbone		0.0	0.9
ec2.7.1.107	mebrane lipid	backbone		6.4	1.8
ec2.7.1.30	mebrane lipid	backbone		0.1	0.7
ec2.7.7.41	mebrane lipid	backbone		0.2	0.9
ec2.7.8.5	membrane lipid	backbone		1.1	0.7
ec3.1.1.5	membrane lipid	backbone		0.8	0.7
ec3.1.3.27	membrane lipid	backbone		0.0	0.9
ec3.1.3.4	membrane lipid	backbone		3.5	1.9
ec3.1.4.3	membrane lipid	backbone		9.1	0.7
PF03062	membrane lipid	backbone		0.9	0.9
acyl carrier protein	membrane lipid	fatty acid		0.0	0.8
ec1.1.1.100	membrane lipid	fatty acid		0.0	0.0
ec1.14.19.1	membrane lipid	fatty acid		2.5	0.6
ec1.14.19.2	membrane lipid	fatty acid		26.2	0.0
ec1.14.19.3	membrane lipid	fatty acid		3.2	1.7
ec1.14.19.4	membrane lipid	fatty acid		11.6	1.9
ec1.14.99.33	membrane lipid	fatty acid		0.6	1.0

ec1.3.1.38	membrane lipid	fatty acid		1.6	1.5
ec1.3.1.9	membrane lipid	fatty acid		1.1	0.6
ec1.3.3.6	membrane lipid	fatty acid		5.5	0.9
ec1.3.99.3	membrane lipid	fatty acid		0.3	0.8
ec2.3.1.16	membrane lipid	fatty acid		0.0	0.9
ec2.3.1.179	membrane lipid	fatty acid		0.0	0.0
ec2.3.1.180	membrane lipid	fatty acid		6.7	0.6
ec2.3.1.181	membrane lipid	fatty acid		0.7	1.7
ec2.3.1.39	membrane lipid	fatty acid		0.4	0.6
ec3.1.2.14	membrane lipid	fatty acid		12.2	2.1
ec3.1.2.20	membrane lipid	fatty acid		2.5	1.8
ec3.1.2.22	membrane lipid	fatty acid		15.1	0.3
ec4.2.1.17	membrane lipid	fatty acid		0.0	0.4
ec4.2.1.60	membrane lipid	fatty acid		0.5	0.5
ec6.2.1.3	membrane lipid	fatty acid		0.0	0.0
ec6.4.1.2	membrane lipid	fatty acid		0.0	0.9
ec2.1.1.103	membrane lipid	headgroup		2.5	4.7
ec2.3.1.50	membrane lipid	headgroup		0.5	0.9
ec2.7.1.32	membrane lipid	headgroup		3.1	1.8
ec2.7.1.82	membrane lipid	headgroup		4.1	1.8
ec2.7.7.14	membrane lipid	headgroup		1.4	1.6
ec2.7.7.15	membrane lipid	headgroup		4.9	1.4
ec2.7.8.1	membrane lipid	headgroup		2.2	1.1
ec2.7.8.11	membrane lipid	headgroup		0.3	0.5
ec2.7.8.2	membrane lipid	headgroup		2.1	1.1
ec2.7.8.24	membrane lipid	headgroup		17.4	0.6
ec3.1.3.75	membrane lipid	headgroup		4.0	2.6
ec3.13.1.1	membrane lipid	headgroup		0.0	0.9
PF04191	membrane lipid	headgroup		22.3	0.8
PF11899	membrane lipid	headgroup		12.1	3.5
ec2.4.1.241	membrane lipid	headgroup		2.9	1.9
ec2.4.1.46	membrane lipid	headgroup		0.1	2.1
ec2.3.1.158	triacylglyceride			1.9	1.5
ec2.3.1.20	triacylglyceride			2.9	2.1
ec3.1.1.3	triacylglyceride			0.1	1.2
PF03982	triacylglyceride			8.1	1.6
ec2.5.1.1	terpenoid	downstream from IPP		0.4	0.0
ec2.5.1.10	terpenoid	downstream from IPP		0.4	0.0
ec2.5.1.29	terpenoid	downstream from IPP		0.2	0.4
ec2.5.1.32	terpenoid	downstream from IPP		0.0	0.6
ec5.3.3.2	terpenoid	downstream from IPP		0.6	1.6
ec1.1.1.267	terpenoid	MEP/DOXP		0.6	0.8
ec1.17.1.2	terpenoid	MEP/DOXP		0.2	0.9
ec1.17.7.1	terpenoid	MEP/DOXP		0.3	1.2
ec2.2.1.7	terpenoid	MEP/DOXP		0.2	0.6
ec2.7.1.148	terpenoid	MEP/DOXP		1.9	0.7
ec2.7.7.60	terpenoid	MEP/DOXP		14.5	0.5
ec4.6.1.12	terpenoid	MEP/DOXP		2.0	0.0
ec1.1.1.34	terpenoid	MVA		18.2	0.9
ec1.1.1.88	terpenoid	MVA		1.1	0.0
ec2.3.3.10	terpenoid	MVA		10.0	4.5
ec2.7.1.36	terpenoid	MVA		1.0	0.8
ec2.7.4.2	terpenoid	MVA		13.7	0.8
ec4.1.1.33	terpenoid	MVA		28.1	1.4
ec2.1.1.14	vitamin	B12		1.4	2.0
PF00809	vitamin	B12		0.2	1.1
PF01717	vitamin	B12		1.5	2.3
PF02310	vitamin	B12		0.4	1.5
PF02574	vitamin	B12		0.2	0.4
PF02607	vitamin	B12		0.1	0.9
PF02965	vitamin	B12		0.1	1.2

PF08267	vitamin	B12		1.5	1.5
ec1.1.1.65	vitamin	B6		0.2	0.4
ec1.2.1.72	vitamin	B6		0.2	0.9
ec1.4.3.5	vitamin	B6		5.3	4.3
ec2.3.1.47	vitamin	B6		0.0	0.9
ec2.6.1.52	vitamin	B6		0.0	0.9
ec2.7.1.35	vitamin	B6		0.9	1.2
ec3.1.3.74	vitamin	B6		1.7	0.8
ec4.2.3.1	vitamin	B6		0.0	0.6
PF01174	vitamin	B6		0.4	1.0
ec2.6.1.62	vitamin	biotin		1.0	0.7
ec2.8.1.6	vitamin	biotin		0.6	0.6
ec6.2.1.14	vitamin	biotin		5.3	1.5
ec6.3.3.3	vitamin	biotin		2.0	1.2
ec6.3.4.10	vitamin	biotin		3.6	3.0
ec6.3.4.11	vitamin	biotin		3.6	3.0
ec6.3.4.15	vitamin	biotin		0.8	1.4
ec6.3.4.9	vitamin	biotin		3.6	3.0
ec1.4.3.19	vitamin	thiamine		0.7	2.3
ec2.5.1.3	vitamin	thiamine		0.5	0.8
ec2.7.1.49	vitamin	thiamine		1.6	1.2
ec2.7.1.50	vitamin	thiamine		6.3	2.3
ec2.7.4.16	vitamin	thiamine		0.3	1.2
ec2.7.4.7	vitamin	thiamine		1.8	1.2
ec2.7.6.2	vitamin	thiamine		0.7	0.9
ec2.8.1.7	vitamin	thiamine		0.0	0.9
ec3.5.99.2	vitamin	thiamine		3.6	2.2
ec3.6.1.15	vitamin	thiamine		0.2	1.2
ec3.6.1.28	vitamin	thiamine		7.0	3.0
PF00899	vitamin	thiamine		0.0	0.0
PF01946	vitamin	thiamine		10.5	1.1
PF01964	vitamin	thiamine		4.4	2.6
PF02110	vitamin	thiamine		4.9	3.4
PF00636	misc	RNA silencing		2.2	1.8
PF02170	misc	RNA silencing		4.9	1.1
PF02171	misc	RNA silencing		4.7	0.9
PF03368	misc	RNA silencing		1.0	1.3
PF05183	misc	RNA silencing		0.2	0.6
PF02301	misc	meiosis		1.2	1.3
PF03962	misc	meiosis		1.8	2.0
PF07106	misc	meiosis		0.8	1.3
SPO11	misc	meiosis		8.8	1.5
PF00078	misc	misc		3.3	0.7
PF00270	misc	misc		0.0	0.0
PF00271	misc	misc		0.0	0.0
PF00493	misc	misc		0.1	1.1
PF02889	misc	misc		17.0	0.8
PF08241	misc	misc		1.1	0.0
PF08423	misc	misc		4.2	1.3
PF13489	misc	misc		1.1	0.0

1: Pfam code:name or EC number from which HMM was generated; for the four HMM names that are not prefaced by PF (Pfam) or ec (constructed by us from KEGG equence alignments for that EC number) the HMM was constructed from sequence alignments obtained using PSI-BLAST, from sequences described in the text

2: Thes are subjective and in some cases fairly arbitrary categories

3: These are the Fisher exact test p-values for the distribution of HMM hits across the five major clades or the best of the branches along the Chlorophyte lineage. Coloring is from white (p-val = 1) 0 to darkest green (p-val is the lowest in that column. Colors are interpolated by Excel based on the values shown in the cells.

Supplementary Table S4: strains analyzed for DGTS by mass spectrometry

1kP_Sample	species	strain name	media	DUF3419 positive?	DGTS by MS?
IRZA	<i>Proteomonas sulcata</i>	CCMP 704	f/2-Si	+	+
NMAK	<i>Pavlova lutheri</i>	UTEX LB 1293	F/2 media	+	+
OBUY	<i>Porphyridium cruentum</i>	UTEX 161	F/2 media	-	-
RHVC	<i>Dunaliella salina</i>	SAG 42.88	ASP-12 + soil extra	+	+
QRTH	<i>Chlorococcum microstigmaticum</i>	SAG 11.43	Waris-H	+	+
PRIQ	<i>Chlorococcum oleofaciens</i>	SAG 30.93	Waris-H	+	+
ZLQE	<i>Stephanosphaera pluvialis</i>	SAG 78-1a	Waris-H	+	+
VALZ	<i>Chlamydomonas noctigama</i>	SAG 36.72	Waris-H	+	+
JRGZ	<i>Chlamydomonas moewusii</i>	SAG 1.98	Waris-H	+	+
IHOI	<i>Chloromonas oogama</i>	SAG 9.79	Waris-H	+	+
BCYF	<i>Chlamydomonas cribrum</i>	SAG 13.72	Waris-H	+	+
IRYH	<i>Heterochlamydomonas inaequalis</i>	SAG 4.75	Waris-H	+	+
LBRP	<i>Chloromonas reticulata</i>	SAG 26.86	Waris-H	+	+
VJDZ	<i>Botryococcus sudeticus</i>	UTEX 2629	3N-BBM-V media	+	+
PZIF	<i>Scenedesmus dimorphus</i>	UTEX 746	3N-BBM-V media	+	+
MWAN	<i>Chlorella minutissima</i>	UTEX 2219	F/2 media	+	+
ETGN	<i>Botryococcus braunii</i>	UTEX 2441	3N-BBM-V media	-	+
EEJO	<i>Neochloris oleoabundans</i>	UTEX 1185	3N-BBM-V media	-	-
JQFK	<i>Picochlorum atomus</i>	UTEX LB 1998	F/2 media	+	+
HVNO	<i>Tetraselmis chui</i>	UTEX LB 232	F/2 media	+	+
PUAN	<i>Pedinomonas tuberculata</i>	CCAP 1965/2	Waris-H	+	+
AYPS	unidentified species	CCMP 1205	ASP-12	+	+
TGNL	<i>Picocystis salinarum</i>	CCMP 1897	ASP-12	+	-
HYHN	<i>Prasinoderma coloniale</i>	CCMP 1413	ASP-12	+	+
KYIO	<i>Mesostigma viride</i>	NIES 476	Waris-H	-	-
MXEZ	<i>Pycnococcus provasolii</i>	CCMP 1203	ASP-12	+	+