

957 **List of Supplementary Figures**

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960 **Supplementary Figure S1.** Phylogenetic tree of the partial 18S rRNA gene sequence for the
961 Pedinellales strains isolated during the MALINA cruise. 434 unambiguously aligned positions
962 were considered from an alignment of 37 nucleotide sequences. The evolutionary history was
963 inferred by using the Maximum Likelihood method based on the Kimura 2-parameter model (Nei
964 and Kumar, 2000). Please note that the sequences with a code starting with ZZ are not available in
965 Genbank but are deposited in the RCC database and available at [http://www.sb-](http://www.sb-roscoff.fr/Phyto/RCC)
966 [roscoff.fr/Phyto/RCC](http://www.sb-roscoff.fr/Phyto/RCC). The tree with the highest log likelihood (-2090.1471) is shown. The
967 percentage of trees in which the associated taxa clustered together is shown next to next to the
968 branches from left (ML, 1000 replicates) to right (NJ, 1000 replicates). Initial tree(s) for the
969 heuristic search were obtained automatically as follows. A discrete Gamma distribution was used to
970 model evolutionary rate differences among sites [5 categories (+G, parameter = 0.4258)]. The tree
971 is drawn to scale, with branch lengths measured in the number of substitutions per site.

972 Evolutionary analyses were conducted in MEGA5 (Tamura 2011). The tree was rooted with
973 Chrysophyceae (*Paraphysomonas foraminifera*, *Dinobryon sociale* and *Spumella danica*) as
974 outgroups. The tree has been edited and includes ML and NJ bootstrap values as described in
975 Figure 2.

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977 **Supplementary Figure S2.** Rarefaction curve for the strains isolated during the Leg 2b of the
978 MALINA cruise indicating the number of distinct genotypes found as function of the number of
979 strains sequenced. The curve is based on partial 18S rRNA gene sequences.

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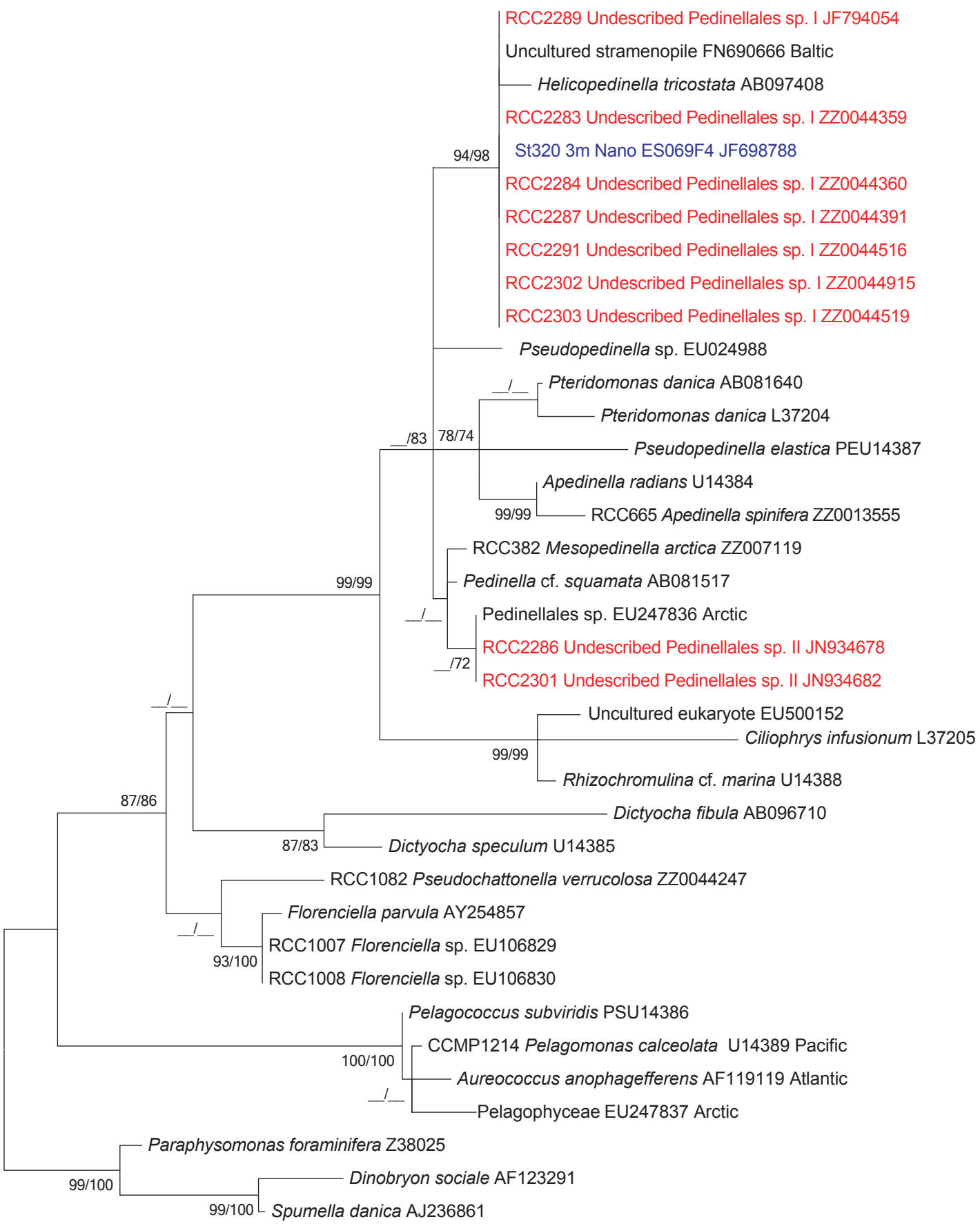
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1 **Supplementary Tables**

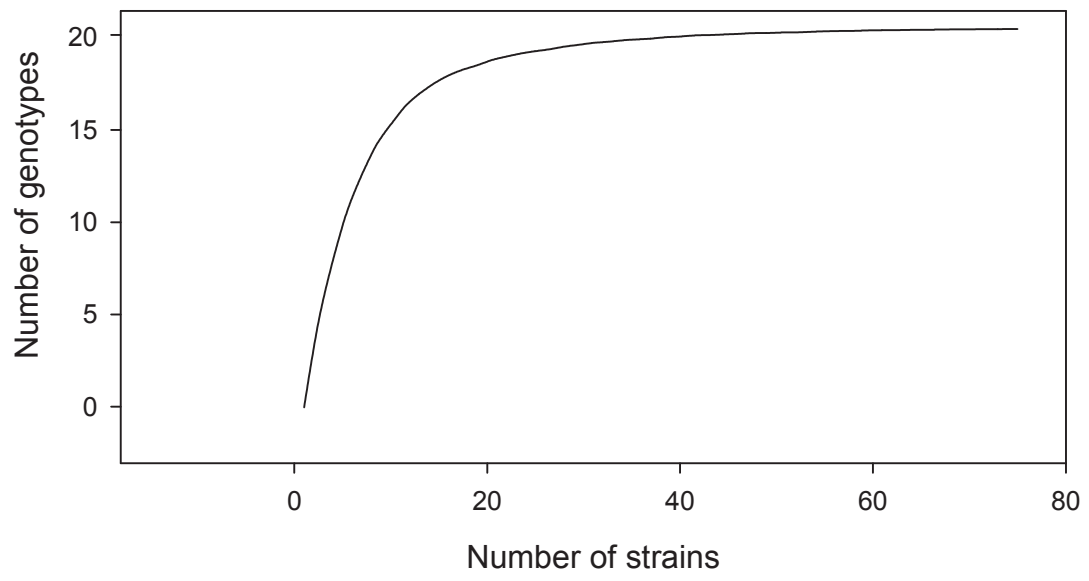
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3 **Supplementary Table S1.** List of strains isolated during the MALINA cruise and deposited to the
4 Roscoff Culture Collection (RCC). Cultures were enriched by Tangential Flow Filtration (TFF) or
5 medium enrichment. Flow Cytometry Sorting targets were defined on cytograms of side scatter (a
6 function of cell size) vs. red fluorescence (a function of chlorophyll content). Size corresponds to
7 average cell diameter of the cultures.

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0.02



Division	Class	Order	Putative identification	RCC #	Strain name	Lost	Enrichment step*	Isolation technique	Purified by single CTD	Station	Depth	Size (µm)	Morphology	Partial 18S *	full 18S	28S	ITS	
Alveolata	Dinophyceae	Lophodiales	<i>Baccharera cincta</i>	2013	MALINA FT56.6 PG2		TFF concentrated	Micropipette	1 F/2	56	110 3 m		15 LM, SEM, TEM		JF784059		JQ413373	
Alveolata	Dinophyceae	Lophodiales	<i>Baccharera cincta</i>	2013	MALINA FT56.6 PG8	yes	TFF concentrated	Micropipette	1 F/2	56	110 3 m			Z20044543	JN934687		JQ413374	
Chlorophyta	Chlorophyceae	Volvocales	<i>Carneria</i> sp.	2487	MALINA FT99.6 PG8		TFF concentrated	Micropipette	1 F/2	39	620 3 m		20 LM		JN934685			
Chlorophyta	Chlorophyceae	Volvocales	<i>Chlamydomonas</i> sp. I	2488	MALINA FT89.6 PG5		TFF concentrated	Micropipette	1 K/2	89	670 3 m		10 LM		JN934686			
Chlorophyta	Chlorophyceae	Volvocales	<i>Chlamydomonas</i> sp. II	2041	MALINA FT34.3 PG2		TFF concentrated	Micropipette	1 K/2	35	680 40 m		15 LM		JN934674			
Chlorophyta	Chlorophyceae	Volvocales	<i>Chlamydomonas</i> sp. II	2512	MALINA FT34.3 PG4		TFF concentrated	Micropipette	1 K/2	35	680 40 m			Z20044526			Z20044994	
Chlorophyta	Mamiellophyceae	Mamielliales	<i>Arctic Micromonas</i>	2259	MALINA S666		Pico sorting	Pico sorting	200 K/2	191	236 3 m			Z20044411			Z20045002	
Chlorophyta	Mamiellophyceae	Mamielliales	<i>Arctic Micromonas</i>	2310	MALINA S664		Pico sorting	Pico sorting	200 K/2	191	236 3 m			Z20044437			Z20044995	
Chlorophyta	Mamiellophyceae	Mamielliales	<i>Bathycoccus prasinos</i>	2318	MALINA S625	yes	Pico sorting	Pico sorting	200 K/2	125	345 70 m				JF784058			
Chlorophyta	Mamiellophyceae	Mamielliales	<i>Arctic Micromonas</i>	2318	MALINA S625		Pico sorting	Pico sorting	100 K/2	125	345 70 m			Z20044561			Z20045007	
Chlorophyta	Mamiellophyceae	Mamielliales	<i>Arctic Micromonas</i>	2307	MALINA S544		Nano sorting	Pico sorting	20 K/2	38	394 3 m			Z20044271				
Chlorophyta	Mamiellophyceae	Mamielliales	<i>Arctic Micromonas</i>	2307	MALINA S544		Pico sorting	Pico sorting	20 K/2	106	430 65 m			Z20044429				
Chlorophyta	Mamiellophyceae	Mamielliales	<i>Arctic Micromonas</i>	2317	MALINA S596C		Pico sorting	Pico sorting	100 K/2	138	430 65 m			Z20044521			Z20045008	
Chlorophyta	Mamiellophyceae	Mamielliales	<i>Arctic Micromonas</i>	2308	MALINA S623		Pico sorting	Pico sorting	20 K/2	145	460 56 m		2 LM		JN934683			Z20045000
Chlorophyta	Mamiellophyceae	Mamielliales	<i>Arctic Micromonas</i>	2309	MALINA S625		Pico sorting	Pico sorting	100 K/2	145	460 56 m			Z20044531			JQ413371	
Chlorophyta	Mamiellophyceae	Mamielliales	<i>Arctic Micromonas</i>	2309	MALINA S625		Pico sorting	Pico sorting	100 K/2	145	460 56 m			Z20044436				
Chlorophyta	Mamiellophyceae	Mamielliales	<i>Arctic Micromonas</i>	2514	MALINA S664	yes	Pico sorting	Pico sorting	100 K/2	134	540 70 m			Z20044561				
Chlorophyta	Mamiellophyceae	Mamielliales	<i>Arctic Micromonas</i>	2253	MALINA S463		Pico sorting	Pico sorting	5000 K/2	99	620 0 m		2 LM				Z20044988	
Chlorophyta	Mamiellophyceae	Mamielliales	<i>Arctic Micromonas</i>	2254	MALINA S464		Pico sorting	Pico sorting	5000 K/2	99	620 3 m			Z20044372			Z20044989	
Chlorophyta	Mamiellophyceae	Mamielliales	<i>Arctic Micromonas</i>	2311	MALINA FT93.1P1		TFF concentrated	Pico sorting	800 K/2	99	620 65 m			Z20044416				
Chlorophyta	Mamiellophyceae	Mamielliales	<i>Arctic Micromonas</i>	2314	MALINA S448		Pico sorting	Pico sorting	1000 K/2	99	620 65 m			Z20044515			Z20045005	
Chlorophyta	Mamiellophyceae	Mamielliales	<i>Arctic Micromonas</i>	2314	MALINA S448	yes	Pico sorting	Pico sorting	5000 K/2	99	620 3 m			Z20044373				
Chlorophyta	Mamiellophyceae	Mamielliales	<i>Arctic Micromonas</i>	2314	MALINA S448		Pico sorting	Pico sorting	5000 K/2	99	620 3 m			Z20044374				
Chlorophyta	Mamiellophyceae	Mamielliales	<i>Arctic Micromonas</i>	2314	MALINA S466		Pico sorting	Pico sorting	5000 K/2	99	620 3 m			Z20044404				
Chlorophyta	Mamiellophyceae	Mamielliales	<i>Arctic Micromonas</i>	2314	MALINA S466	yes	Pico sorting	Pico sorting	5000 K/2	99	620 65m			Z20044404				
Chlorophyta	Mamiellophyceae	Mamielliales	<i>Arctic Micromonas</i>	2312	MALINA S412		Pico sorting	Pico sorting	10000 K/2	89	670 70 m			Z20044510			Z20045003	
Chlorophyta	Mamiellophyceae	Mamielliales	<i>Arctic Micromonas</i>	2313	MALINA S413		Pico sorting	Pico sorting	10000 K/2	89	670 70 m			Z20044511			Z20045004	
Chlorophyta	Mamiellophyceae	Mamielliales	<i>Arctic Micromonas</i>	2251	MALINA S172		Pico sorting	Pico sorting	20 K/2	31	690 3 m			Z20044357			Z20044986	
Chlorophyta	Mamiellophyceae	Mamielliales	<i>Arctic Micromonas</i>	2252	MALINA S493		Pico sorting	Pico sorting	5000 K/2	106	760 3 m			Z20044377			Z20044990	
Chlorophyta	Mamiellophyceae	Mamielliales	<i>Arctic Micromonas</i>	2256	MALINA S494		Pico sorting	Pico sorting	5000 K/2	106	760 3 m		2 LM				Z20044991	
Chlorophyta	Mamiellophyceae	Mamielliales	<i>Arctic Micromonas</i>	2257	MALINA S609		Pico sorting	Pico sorting	100 K/2	106	760 3 m			Z20044388			JQ413367	
Chlorophyta	Mamiellophyceae	Mamielliales	<i>Arctic Micromonas</i>	2258	MALINA S643		Pico sorting	Pico sorting	100 K/2	106	760 3 m			Z20044382			Z20044992	
Chlorophyta	Mamiellophyceae	Mamielliales	<i>Arctic Micromonas</i>	2304	MALINA S479		Pico sorting	Pico sorting	10000 K/2	106	760 70 m			Z20044421				
Chlorophyta	Mamiellophyceae	Mamielliales	<i>Arctic Micromonas</i>	2305	MALINA S482		Pico sorting	Pico sorting	10000 K/2	106	760 70 m			Z20044428				
Chlorophyta	Mamiellophyceae	Mamielliales	<i>Arctic Micromonas</i>	2315	MALINA S484		Pico sorting	Pico sorting	10000 K/2	106	760 70 m			Z20044570			Z20045006	
Chlorophyta	Mamiellophyceae	Mamielliales	<i>Arctic Micromonas</i>	2315	MALINA S484	yes	Pico sorting	Pico sorting	5000 K/2	106	760 3 m			Z20044378				
Chlorophyta	Mamiellophyceae	Mamielliales	<i>Arctic Micromonas</i>	2315	MALINA S484		Pico sorting	Pico sorting	5000 K/2	106	760 3 m			Z20044379				
Chlorophyta	Mamiellophyceae	Mamielliales	<i>Arctic Micromonas</i>	2252	MALINA E31.N1		Medium enrichment (ESM2 + Ge)	Nano sorting	5000 K/2				2 LM				JQ413366	
Chlorophyta	Mamiellophyceae	Mamielliales	<i>Arctic Micromonas</i>	2262	MALINA E31.M1		Medium enrichment (ESM2 + Ge)	Micro sorting	400 K/2					ARC1107094.0 m			Z20044478	
Chlorophyta	Mamiellophyceae	Mamielliales	<i>Arctic Micromonas</i>	2243	MALINA S88		Pico sorting	Pico sorting	20 K/2					ARC1207094.0 m			Z20044985	
Chlorophyta	Mamiellophyceae	Mamielliales	<i>Arctic Micromonas</i>	2244	MALINA S89		Pico sorting	Pico sorting	20 K/2				2 LM				Z20044983	
Chlorophyta	Mamiellophyceae	Mamielliales	<i>Arctic Micromonas</i>	2244	MALINA S89	yes	Pico sorting	Pico sorting	20 K/2					ARC1207094.0 m			Z20044982	
Chlorophyta	Mamiellophyceae	Mamielliales	<i>Arctic Micromonas</i>	2245	MALINA S109		Pico sorting	Pico sorting	20 K/2					BEA1307094.0 m			Z20044355	
Chlorophyta	Mamiellophyceae	Mamielliales	<i>Arctic Micromonas</i>	2245	MALINA S110		Pico sorting	Pico sorting	20 K/2				2 LM				Z20044356	
Chlorophyta	Mamiellophyceae	Mamielliales	<i>Arctic Micromonas</i>	2247	MALINA S115		Pico sorting	Pico sorting	20 K/2					BEA1307094.0 m			Z20044352	
Chlorophyta	Mamiellophyceae	Mamielliales	Undescribed Mamiellophyceae	2285	MALINA E43.N1		Medium enrichment (ESM2 + Ge)	Nano sorting	2000 K/2				LM		JF784053		JQ413368	
Chlorophyta	Mamiellophyceae	Mamielliales	<i>Arctic Micromonas</i>	2248	MALINA S126		Pico sorting	Pico sorting	20 K/2					BEA1407094.0 m			Z20044680	
Chlorophyta	Mamiellophyceae	Mamielliales	<i>Arctic Micromonas</i>	2249	MALINA S130		Pico sorting	Pico sorting	20 K/2					BEA1407094.0 m			Z20044986	
Chlorophyta	Mamiellophyceae	Mamielliales	Undescribed Mamiellophyceae	2288	MALINA E47.P2		Pico sorting	Pico sorting	20000 K/2					BEA1407094.0 m			Z20044354	
Chlorophyta	Mamiellophyceae	Mamielliales	Undescribed Mamiellophyceae	2407	MALINA E47.P1		Medium enrichment (JM2 + Ge)	Pico sorting	2000 K/2				4 LM		JN934679		JQ413369	
Chlorophyta	Mamiellophyceae	Mamielliales	<i>Arctic Micromonas</i>	2242	MALINA S51		Medium enrichment (JM2 + Ge)	Pico sorting	20 K/2					BEA1407094.0 m			Z20044402	
Chlorophyta	Mamiellophyceae	Mamielliales	<i>Arctic Micromonas</i>	2242	MALINA S51		Pico sorting	Pico sorting	20 K/2					BER1007094.0 m			Z20044369	
Chlorophyta	Nephroselmidiophyceae	Nephroselmidiales	<i>Nephroselmis pyriformis</i>	2490	MALINA E28.N1.P20C6		Medium enrichment (K2 + Ge)	Pico sorting	1 K/2	yes			3 LM				Z20044917	
Chlorophyta	Nephroselmidiophyceae	Nephroselmidiales	<i>Nephroselmis pyriformis</i>	2490	MALINA E28.N1.P20C7		Medium enrichment (K2 + Ge)	Pico sorting	1 K/2	yes			4 LM		JN934688			
Chlorophyta	Nephroselmidiophyceae	Nephroselmidiales	<i>Nephroselmis pyriformis</i>	2490	MALINA E28.N1.P20C8		Medium enrichment (K2 + Ge)	Pico sorting	1 K/2	yes			3 LM				Z20044523	
Chlorophyta	Prasinophyceae	Pyramimonadales	<i>Pyramimonas</i> sp. II	2015	MALINA FT56.6 PG4		TFF concentrated	Micropipette	1 F/2	56	110 3 m		8 LM		JF784048			
Chlorophyta	Prasinophyceae	Pyramimonadales	<i>Pyramimonas</i> sp. II	2047	MALINA FT56.6 PG5		TFF concentrated	Micropipette	1 F/2	56	110 3 m		9 LM				Z20044506	
Chlorophyta	Prasinophyceae	Pyramimonadales	<i>Pyramimonas</i> sp. III	1987	MALINA FT42.3 PG8		TFF concentrated	Micropipette	1 F/2	42	280 30 m				JN934670			
Chlorophyta	Prasinophyceae	Pyramimonadales	<i>Pyramimonas</i> sp. II	2048	MALINA FT99.6 PG4		TFF concentrated	Micropipette	1 F/2	56	620 3 m			Z20044508				
Chlorophyta	Prasinophyceae	Pyramimonadales	<i>Pyramimonas</i> sp. II	2502	MALINA FT99.6 PG6		TFF concentrated	Micropipette	1 F/2	39	620 3 m			Z20044421				
Chlorophyta	Prasinophyceae	Pyramimonadales	<i>Pyramimonas</i> sp. IV	2500	MALINA E62.P1		Medium enrichment (F2)	Micropipette	1 F/2	31	690 29 m		6 LM		JN934689			
Chlorophyta	Prasinophyceae	Pyramimonadales	<i>Pyramimonas</i> sp. IV	2501	MALINA E62.P5		Medium enrichment (F2)	Micropipette	1 F/2	31	690 29 m		5 LM				Z20044442	
Chlorophyta	Prasinophyceae	Pyramimonadales	<i>Pyramimonas</i> sp. I	2009	MALINA FT161.6.P1		TFF concentrated	Micropipette	1 K/2	106	760 3 m		7 LM		JF784047			
Chlorophyta	Prasinophyceae	Pyramimonadales	<i>Pyramimonas</i> sp. II	2286	MALINA E36.2.P18.E8		Medium enrichment (K2 + Ge)	Pico sorting	1 K/2	yes				ARC1207094.0 m			Z20044489	
Chlorophyta	Prasinophyceae	Pyramimonadales	<i>Pyramimonas</i> sp. II	2287	MALINA E36.2.P18.F10		Medium enrichment (K2 + Ge)	Pico sorting	1 K/2	yes				BEA1307094.0 m			Same as above	
Chlorophyta	Prasinophyceae	Pyramimonadales	<i>Pyramimonas</i> sp. II	2295	MALINA E43.MP18D1		Medium enrichment (K2 + Ge)	Micro sorting	1 K/2	yes			8 LM				Z20044914	
Cryptophyta	Cryptophyceae	Rhodomonadales	<i>Rhodomonas</i> sp.	2044	MALINA FT42.3 PG12		TFF concentrated	Micropipette	1 F/2	42	280 30 m		15 LM				Z20044504	
Cryptophyta	Cryptophyceae	Rhodomonadales	<i>Rhodomonas</i> sp.	2045	MALINA FT42.3 PG13		TFF concentrated	Micropipette	1 F/2	42	280 30 m						Z20044470	
Cryptophyta	Cryptophyceae	Rhodomonadales	<i>Rhodomonas</i> sp.	2503	MALINA FT99.6 PG7		TFF concentrated	Micropipette	1 F/2	39	620 3 m			Z20044567				
Cryptophyta	Cryptophyceae	Rhodomonadales	<i>Rhodomonas</i> sp.	2019	MALINA FT34.4 PG1		TFF concentrated	Micropipette	1 F/2	35	680 3 m		12 LM				Z20044458	
Cryptophyta	Cryptophyceae	Rhodomonadales	<i>Rhodomonas</i> sp.	2020	MALINA FT34.4 PG2		TFF concentrated											