Emiliania huxleyi CCMP 1516																					
Salinity			26.6	26.6	26.6	26.6	29.1	29.1	29.1	29.1	32	32.1	32	32.1	35.2	35.2	35.2	35.3	37.3	37.4	37.3	37.5
Replicate			A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
Water			-11	-10	-9	-12	-6	-6	-5	-5	0	-3	0	-1	2	3	3	2	7	7	6	6
SD			1	1	2	2	2	1	1	1	1	2	2	2	0	1	1	2	2	2	1	2
Reference	Lipid																					
M'Boule et al. (2014)	C_{37}	δ^2H ‰	-208	-210	-218	-207	-203	-202	-211	-200	-195	-194	-197	-187	-185	-180	-182	-180	-176	-173	-176	-174
		SD	5	3	1	1	1	1	6	2	3	2	3	2	2	1	7	4	1	2	3	3
		alpha	0.802	0.798	0.789	0.802	0.802	0.803	0.792	0.805	0.805	0.809	0.803	0.814	0.813	0.818	0.811	0.818	0.818	0.821	0.819	0.822
		SD	0.006	0.003	0.003	0.003	0.003	0.002	0.006	0.002	0.004	0.004	0.003	0.004	0.002	0.002	0.006	0.004	0.002	0.003	0.003	0.004
This study	Sterol	δ^2H ‰	-318	-324	-334	-332	-312	-336	-327	-314	-325	-316	-320	-317	-	-309	-289	-310	-308	-301	-285	-310
		SD	20	1	4	4	1	1	1	4	8	1	1	1	-	7	0	3	2	1	16	0
		alpha	0.690	0.683	0.672	0.675	0.693	0.669	0.676	0.689	0.675	0.687	0.681	0.684	-	0.689	0.709	0.689	0.687	0.693	0.710	0.686
		SD	0.014	0.004	0.006	0.006	0.004	0.003	0.003	0.006	0.009	0.003	0.003	0.003	-	0.008	0.002	0.006	0.005	0.004	0.014	0.002
This study	Phytol	δ^2H ‰	-387	-387	-406	-382	-396	-411	-404	-375	-405	-382	-395	-384	-	-389	-407	-375	-393	-390	-398	-381
		SD	20	13	1	7	2	0	1	6	3	2	2	2	-	8	1	10	0	3	4	1
		alpha	0.620	0.619	0.600	0.625	0.608	0.593	0.599	0.629	0.595	0.620	0.605	0.616	-	0.609	0.591	0.624	0.603	0.605	0.598	0.615
		SD	0.007	0.006	0.002	0.005	0.003	0.002	0.002	0.004	0.003	0.003	0.003	0.003	-	0.005	0.002	0.005	0.002	0.003	0.004	0.002
This study	$C_{14:0}$	δ^2H ‰	-246	-	-	-	-240	-	-	-	-229	-	-	-	-	-	-	-	-204	-	-	-
		SD	1	-	-	-	1	-	-	-	0	-	-	-	-	-	-	-	1	-	-	-
		alpha	0.762	-	-	-	0.764	-	-	-	0.771	-	-	-	-	-	-	-	0.791	-	-	-
		SD	0.002	-	-	-	0.003	-	-	-	0.001	-	-	-	-	-	-	-	0.002	-	-	-
This study	$C_{16:0}$	δ^2H ‰	-214	-	-	-	-211	-	-	-	-207	-	-	-	-	-	-	-	-180	-	-	-
		SD	2	-	-	-	1	-	-	-	0	-	-	-	-	-	-	-	1	-	-	-
		alpha	0.795	-	-	-	0.793	-	-	-	0.793	-	-	-	-	-	-	-	0.814	-	-	-
		SD	0.007	-	-	-	0.004	-	-	-	0.002	-	-	-	-	-	-	-	0.005	-	-	-
This study	$C_{18:1}$	δ^2H ‰	-166	-	-	-	-149	-	-	-	-135	-	-	-	-	-	-	-	-122	-	-	-
		SD	2	-	-	-	2	-	-	-	1	-	-	-	-	-	-	-	2	-	-	-
		alpha	0.844	-	-	-	0.856	-	-	-	0.865	-	-	-	-	-	-	-	0.872	-	-	-
		SD	0.02	-	-	-	0.002	-	-	-	0.001	-	-	-	-	-	-	-	0.002	-	-	-

Isochrysis galbana CCMP 1323																				
Salinity			10.3	10.2	10.3	15.3	15.3	15.3	20.3	20.3	20.3	25.2	25.2	25.2	30.3	30.3	30.3	35.6	35.6	35.6
Replicate			A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Water			-29	-30	-30	-22	-22	-22	-17	-17	-16	-9	-11	-10	-3	-3	-2	4	5	5
SD			1	1	2	1	1	1	2	2	2	2	1	1	2	1	1	2	1	1
Reference	Lipid																			
M'Boule et al. (2014)	C_{37}	δ^2H ‰	-172	-172	-170	-158	-157	-158	-142	-140	-144	-122	-126	-121	-111	-106	-109	-97	-99	-98
		SD	1	2	1	1	1	1	3	1	3	1	1	1	1	1	2	2	3	5
		alpha	0.853	0.853	0.856	0.861	0.863	0.86	0.873	0.875	0.871	0.886	0.883	0.889	0.892	0.896	0.893	0.9	0.896	0.898
		SD	0.002	0.003	0.002	0.002	0.002	0.002	0.004	0.002	0.004	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.006
This study	Sterol	δ^2H ‰	-296	-300	-	-279	-	-285	-264	-276	-	-255	-241	-236	-	-	-	-	-	-
		SD	2	2	-	3	-	6	8	3	-	1	5	5	-	-	-	-	-	-
		alpha	0.724	0.720	-	0.736	-	0.731	0.748	0.736	-	0.752	0.766	0.771	-	-	-	-	-	-
		SD	0.004	0.003	-	0.004	-	0.009	0.011	0.005	-	0.002	0.007	0.006	-	-	-	-	-	-
This study	Phytol	δ^2H ‰	-430	-405	-	-424	-	-430	-414	-421	-	-404	-395	-393	-	-	-	-	-	-
		SD	5	4	-	5	-	4	5	4	-	2	4	1	-	-	-	-	-	-
		alpha	0.586	0.612	-	0.588	-	0.583	0.596	0.589	-	0.601	0.611	0.613	-	-	-	-	-	-
		SD	0.008	0.007	-	0.009	-	0.008	0.008	0.008	-	0.004	0.007	0.002	-	-	-	-	-	-
Heinzelmann et al. (2015)	$C_{14:0}$	δ^2H ‰	-290	-269	-261	-284	-266	-245	-272	-231	-239	-254	-237	-224	-242	-224	-214	-234	-211	-193
		SD	0	1	1	1	1	2	1	6	0	5	2	3	0	0	2	1	1	1
		alpha	0.731	0.732	0.740	0.753	0.761	0.763	0.752	0.749	0.780	0.771	0.777	0.785	0.758	0.770	0.772	0.780	0.784	0.799
		SD	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.004	0.002	0.004	0.002	0.002	0.002	0.001	0.002	0.002	0.002	0.002
Heinzelmann et al. (2015)	$C_{16:0}$	δ^2H ‰	-281	-262	-256	-271	-259	-248	-259	-237	-236	-241	-231	-221	-230	-218	-207	-229	-201	-193
		SD	2	2	1	1	2	1	3	1	2	6	2	2	2	1	1	0	1	1
		alpha	0.740	0.746	0.754	0.766	0.772	0.767	0.758	0.756	0.775	0.776	0.784	0.795	0.762	0.767	0.775	0.783	0.791	0.800
		SD	0.003	0.003	0.001	0.001	0.003	0.001	0.004	0.001	0.003	0.008	0.003	0.003	0.003	0.001	0.001	0.000	0.001	0.001
Heinzelmann et al. (2015)	$C_{18:1}$	δ^2H ‰	-216	-229	-215	-204	-219	-213	-184	-217	-207	-170	-203	-196	-163	-188	-181	-145	-175	-177
		SD	1	2	1	1	0	0	2	1	1	6	2	1	1	1	3	4	1	1
		alpha	0.808	0.814	0.830	0.838	0.839	0.851	0.793	0.797	0.795	0.805	0.814	0.821	0.805	0.803	0.804	0.808	0.818	0.816
		SD	0.001	0.003	0.001	0.001	0.000	0.000	0.002	0.001	0.001	0.007	0.003	0.001	0.001	0.001	0.004	0.005	0.001	0.001

Ruttnera lamellosa CCMP 1307																				
Salinity			10.2	10.2	10.2	15.3	15.3	15.3	20.4	20.4	20.3	25	25	25	30	30	30	35	34.9	35
Replicate			A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Water			-29	-31	-33	-23	-26	-25	-18	-16	-19	-11	-9	-11	-6	-6	-3	4	3	5
SD			1	2	2	1	2	1	2	2	2	1	2	1	2	2	2	2	2	3
Reference	Lipid																			
Chivall et al. (2014)	C_{37}	δ^2H ‰	-183	-184	-187	-178	-181	-182	-173	-171	-171	-161	-162	-162	-148	-152	-150	-136	-136	-134
		SD	2	1	1	2	2	2	1	1	1	3	2	1	1	1	1	3	1	1
		alpha	0.842	0.843	0.840	0.841	0.841	0.839	0.842	0.842	0.844	0.849	0.846	0.847	0.857	0.853	0.853	0.860	0.861	0.862
		SD	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.002	0.001	0.002	0.002	0.002	0.003	0.002	0.002
This study	Sterol	δ^2H ‰	-293	-300	-294	-294	-294	-290	-290	-294	-285	-280	-250	-276	-274	-268	-265	-254	-224	-258
		SD	2	2	17	5	6	14	12	6	8	7	19	7	10	2	1	4	11	0
		alpha	0.728	0.723	0.730	0.723	0.725	0.728	0.723	0.717	0.728	0.728	0.757	0.732	0.730	0.737	0.737	0.743	0.774	0.739
		SD	0.003	0.003	0.017	0.005	0.006	0.014	0.013	0.006	0.008	0.007	0.018	0.007	0.010	0.003	0.002	0.005	0.010	0.003
This study	Phytol	δ^2H ‰	-413	-405	-411	-417	-416	-419	-407	-406	-399	-398	-396	-402	-391	-396	-393	-380	-379	-387
		SD	0	4	12	2	3	2	5	3	5	7	13	1	8	4	7	1	2	3
		alpha	0.604	0.614	0.609	0.597	0.600	0.596	0.604	0.604	0.612	0.608	0.609	0.605	0.612	0.608	0.608	0.617	0.619	0.610
		SD	0.002	0.005	0.015	0.003	0.004	0.003	0.007	0.005	0.006	0.008	0.015	0.002	0.009	0.005	0.008	0.002	0.003	0.005

Supplementary Table 1: Hydrogen isotope ratios (δ^2H_{C37}) and fractionation factor α_{C37} values for lipids from *Emiliania huxleyi*, *Isochrysis galbana* and *Ruttnera lamellosa*. Alkenones from *E. huxleyi* and *I. galbana* previously published in M'Boule et al. (2014). Fatty acids from *I. galbana* are from Heinzelmann et al. (2015). Alkenones from *R. lamellosa* were previously published in Chivall et al. (2014).