Article

Morpho- and chemotyping of holopelagic Sargassum species causing massive strandings in the Caribbean region

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Supplementary Materials

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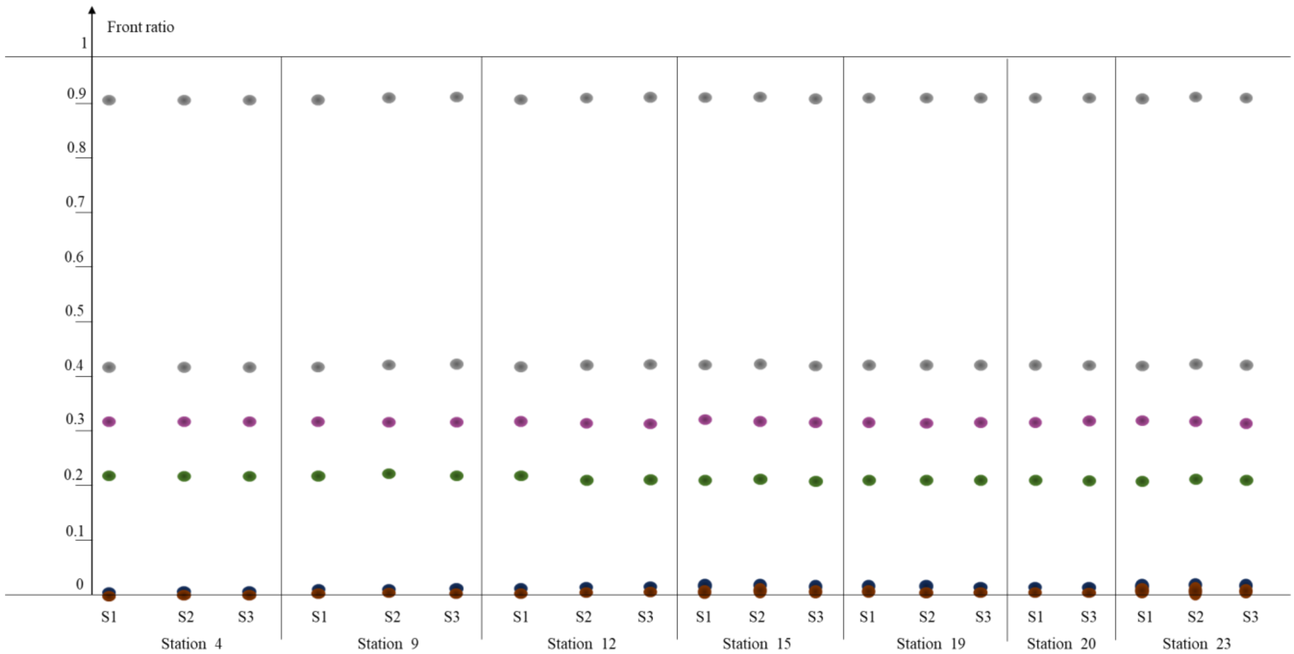

Figure S1. Thin Layer Chromatography of terpene extracts from different floating specimens of the three holopelagic *Sargassum* morphotypes across several stations within the Central Atlantic Ocean.

Table S1. Pigment level (µg.mg^{-1} DW) of the three *Sargassum* morphotypes (S1: *Sargassum natans* var. *wingei*; S2: *Sargassum natans* var. *natans*; S3: *Sargassum fluitans* var. *fluitans*) sampled during the Caribbean cruise. < LOQ = under the limit of quantification; ND = not detected. CD = Chlorophyll *a* degradation rate; AC = Accessory pigments to Chlorophyll *a*; XC = Xanthophyll cycle pigments to Chlorophyll *a*. Mean ± SD; n=3.

Station	Morphotype	Chlorophyll *a* (µg.mg^{-1} DW)	Pheophytin *a* (µg.mg^{-1} DW)	Chlorophyll *c* (µg.mg^{-1} DW)	Fucoxanthin (µg.mg^{-1} DW)	β-carotene (µg.mg^{-1} DW)	Violaxanthin (µg.mg^{-1} DW)	Zeaxanthin (µg.mg^{-1} DW)	CD ratio	AC ratio	XC ratio
4	S1	0.459 ± 0.013	< LOQ	0.041 ± 0.003	0.122 ± 0.009	0.009 ± 0.000	0.015 ± 0.001	ND	1.000 ± 0.000	0.375 ± 0.015	0.032 ± 0.001
	S2	0.650 ± 0.045	ND	0.064 ± 0.001	0.199 ± 0.013	0.019 ± 0.001	0.033 ± 0.001	ND	1.000 ± 0.000	0.433 ± 0.010	0.051 ± 0.002
	S3	0.910 ± 0.089	< LOQ	0.090 ± 0.009	0.301 ± 0.034	0.022 ± 0.002	0.036 ± 0.004	ND	1.000 ± 0.000	0.453 ± 0.008	0.039 ± 0.001
9	S1	0.657 ± 0.030	< LOQ	0.064 ± 0.004	0.212 ± 0.012	0.015 ± 0.000	0.019 ± 0.002	ND	1.000 ± 0.000	0.443 ± 0.005	0.028 ± 0.001
	S2	1.167 ± 0.051	ND	0.115 ± 0.006	0.383 ± 0.021	0.023 ± 0.002	0.059 ± 0.003	ND	1.000 ± 0.000	0.446 ± 0.005	0.050 ± 0.000
	S3	1.258 ± 0.045	ND	0.127 ± 0.004	0.483 ± 0.018	0.021 ± 0.001	0.059 ± 0.003	ND	1.000 ± 0.000	0.501 ± 0.002	0.047 ± 0.001
12	S1	0.625 ± 0.032	< LOQ	0.053 ± 0.005	0.192 ± 0.015	0.024 ± 0.003	< LOQ	ND	0.000 ± 0.000	0.000 ± 0.014	0.000 ± 0.009
	S2	1.169 ± 0.021	0.182 ± 0.003	0.097 ± 0.004	0.374 ± 0.011	0.036 ± 0.003	0.030 ± 0.001	ND	0.865 ± 0.001	0.433 ± 0.008	0.026 ± 0.000
	S3	1.181 ± 0.023	0.086 ± 0.001	0.103 ± 0.007	0.365 ± 0.022	0.026 ± 0.002	0.033 ± 0.003	ND	0.929 ± 0.005	0.419 ± 0.022	0.028 ± 0.002
23	S1	0.793 ± 0.025	0.227 ± 0.10	0.077 ± 0.003	0.245 ± 0.010	0.032 ± 0.002	0.030 ± 0.001	ND	0.777 ± 0.003	0.447 ± 0.004	0.038 ± 0.000
	S2	1.340 ± 0.013	0.074 ± 0.001	0.105 ± 0.001	0.373 ± 0.003	0.046 ± 0.001	0.058 ± 0.000	ND	0.947 ± 0.001	0.391 ± 0.002	0.043 ± 0.000
	S3	1.218 ± 0.021	0.112 ± 0.002	0.119 ± 0.002	0.396 ± 0.009	0.036 ± 0.000	0.059 ± 0.002	ND	0.916 ± 0.002	0.452 ± 0.002	0.048 ± 0.001
15	S1	0.780 ± 0.018	0.076 ± 0.002	0.047 ± 0.002	0.171 ± 0.006	0.032 ± 0.001	0.010 ± 0.002	ND	0.912 ± 0.001	0.320 ± 0.006	0.013 ± 0.003
	S2	0.908 ± 0.224	0.204 ± 0.216	0.078 ± 0.019	0.234 ± 0.064	0.035 ± 0.008	0.037 ± 0.010	ND	0.828 ± 0.174	0.389 ± 0.105	0.040 ± 0.005
	S3	0.994 ± 0.041	0.093 ± 0.009	0.090 ± 0.005	0.232 ± 0.015	0.024 ± 0.001	0.040 ± 0.003	ND	0.914 ± 0.006	0.349 ± 0.007	0.041 ± 0.001
19	S1	0.134 ± 0.017	0.186 ± 0.021	0.009 ± 0.000	0.011 ± 0.001	0.009 ± 0.001	< LOQ	ND	0.000 ± 0.057	0.000 ± 0.032	0.000 ± 0.000
	S2	0.425 ± 0.080	0.322 ± 0.077	0.053 ± 0.003	0.156 ± 0.009	0.024 ± 0.001	0.019 ± 0.001	0.003 ± 0.001	0.569 ± 0.104	0.559 ± 0.104	0.054 ± 0.007
	S3	0.044 ± 0.005	0.277 ± 0.006	0.013 ± 0.000	0.028 ± 0.002	0.022 ± 0.002	< LOQ	< LOQ	0.000 ± 0.014	0.000 ± 0.136	0.000 ± 0.004

Table S2: Results of statistical analyses (Sheirer-Hare tests and post-hoc test when needed) on pigment contents except zeaxanthin due to low occurrence and pigment ratios. S1: *S. natans* var. *wingei*; S2: *S. natans* var. *natans*; S3: *S. fluitans* var. *fluitans*; CDR = Chlorophyll *a* degradation rate; AC = Accessory pigments to Chlorophyll *a*; XC = Xanthophyll cycle pigments to Chlorophyll *a*.

Pigments	Factor	p-value	Post-hoc test
Chlorophyll *a*	Morphotype	**0.001**	S2 = S3 > S1
	Station	**< 0.001**	23≥9=12=15≥4≥19
	Interaction	0.687	
Phaeophytin *a*	Morphotype	**0.002**	S2 ≥ S3 ≥ S1
	Station	**0.038**	19≥15=12≥23=4=9
	Interaction	**0.004**	
Chlorophyll *c*	Morphotype	**< 0.001**	S2 = S3 > S1
	Station	**< 0.001**	9=12=23≥4=15≥19
	Interaction	0.974	
Fucoxanthin	Morphotype	**< 0.001**	S2 = S3 > S1
	Station	**< 0.001**	9=12=23≥4=15≥19
	Interaction	0.958	
β-carotene	Morphotype	**0.035**	S2 ≥ S3 ≥ S1
	Station	**< 0.001**	23=15≥12≥9=19≥4
	Interaction	0.919	
Violaxanthin	Morphotype	**0.020**	S2 = S3 > S1
	Station	0.067	
	Interaction	**< 0.001**	
CD ratio	Morphotype	0.966	
	Station	**< 0.001**	4=9≥12=23≥15=19
	Interaction	0.653	
AC ratio	Morphotype	**0.007**	S3 ≥ S2 ≥ S1
	Station	**0.010**	9=19≥4=12=23≥15
	Interaction	**0.020**	
XC ratio	Morphotype	**< 0.001**	S2 = S3 > S1
	Station	**0.004**	9=23≥4=15=19≥12
	Interaction	0.212	