

Table 2. List of phytoplankton pigments and their distributions in algae classes, abbreviations and formulas.

Abbreviation	Name	Characteristic of the pigment	Present in/ Index of/Formula
PSC	Photosynthetic carotenoid	Light harvesting	All algae
PPC	Photoprotective carotenoid	Photoprotection	All algae
PPP	Photosynthetic pigment	Light harvesting	All algae
But-fuco	19'-butanoyloxyfucoxanthin	PSC	Prymnesiophytes, crysophytes and dinoflagellates Type 2* (lacking Peridin)
Hex-fuco	19'-hexanoyloxyfucoxanthin	PSC	Major in prymnesiophytes and dinoflagellates Type 2* (lacking Peridin)
Allo	Alloxanthin	PPC	Cryptophytes
α -Car	α -carotene	PPC	Dominant in prochlorophytes, rhodophyte and cryptophyte
β -Car	β -carotene	PPC	Dominant in cyanobacteria, prochlorophytes, chlorophytes, prasinophytes, euglenophytes and diatoms
Chl <i>b</i>	Chlorophyll <i>b</i>	PPP	Chlorophytes, prasinophytes, euglenophytes
Chl <i>c</i> ₁ + <i>c</i> ₂	Chlorophyll <i>c</i> ₁ + <i>c</i> ₂	PPP	Diatoms, prymnesiophytes, dinoflagellates, cryptophytes, chrysophytes and raphidophytes
Chl <i>c</i> ₃	Chlorophyll <i>c</i> ₃	PPP	Prymnesiophytes, chrysophytes and dinoflagellates Type 2* (lacking Peridin)
Chlide α	Chlorophyllide <i>a</i>	Degradation product of Chl <i>a</i>	Senescent phytoplankton
DD	Diadinoxanthin	PPC	Diatoms, prymnesiophytes, dinoflagellates, chrysophytes and raphidophytes
DT	Diatoxanthin	PPC	Diatoms, prymnesiophytes, dinoflagellates, chrysophytes and raphidophytes
Fuco	Fucoxanthin	PSC	Diatoms, prymnesiophytes, chrysophytes, pelagophytes and dinoflagellates Type 2* (lacking Peridin)
Chl <i>a</i>	Chlorophyll <i>a</i>	PPP	All phytoplankton except <i>Prochlorococcus</i>
Peri	Peridinin	PSC	Dinoflagellates Type 1*
Pras	Prasinoxanthin	PPC	Prasinophytes Type 1**
Viola	Violaxanthin	PPC	Chlorophytes, prasinophytes and eustigmatophytes
Zea + Lut	Zeaxanthin + Lutein	PPC	Cyanobacteria, <i>Prochlorococcus</i> , chlorophytes and prasinophytes Type 2**
TChl <i>a</i>	Total chlorophyll <i>a</i>		Chl <i>a</i> + Chlide α
TC	Total carotenoids	Include all carotenoids	But-fuco + Hex-fuco + Allo + α -Car + β -Car + DD + DT + Fuco + Peri + Pras + Viola + Zea
AP	Accessory pigments	Include all pigments except CHLA	TC + Chl <i>b</i> + Chl <i>c</i> ₁ + <i>c</i> ₂ + Chl <i>c</i> ₃

According to Jeffrey et al (1997) or *Higgins et al (2011) or **Vidussi et al (2004).

Table 3 - Initial ratio matrix of accessory pigment to chlorophyll *a* for distinct algal classes for each cluster group. *Ref refers to the literature where the pigment ratios were extracted. See explanation of each group in the methods section.

Region I & II (Eastern Labrador Sea)											
Class / Pigment	Chl <i>b</i>	Chl <i>c</i> ₃	Fuco	Peri	Zea + Lut	Allo	But-fuco	Hex-fuco	Pras	Chl <i>a</i>	*Ref
Prasinophyte 1	0.512	0	0	0	0	0	0	0	0.075	1	2
Prasinophyte 2	0.738	0	0	0	0.008	0	0	0	0	1	2
CHLORO-1	0.339	0	0	0	0.047	0	0	0	0	1	4
Dinoflagellates	0	0	0	0.600	0	0	0	0	0	1	5
Cryptophytes	0	0	0	0	0	0.673	0	0	0	1	2
<i>Phaeocystis</i>	0	0.208	0.350	0	0	0	0	0	0	1	1
HAPTO-6	0	0.155	0.195	0	0	0	0.019	1.054	0	1	4
Chryso/Pelagophyte	0	0.114	0.398	0	0	0	0.595	0	0	1	2
Cyanobacteria	0	0	0	0	0.232	0	0	0	0	1	3
Diatoms	0	0	1.229	0	0	0	0	0	0	1	2
Region III & V (Central Labrador Sea)											
Class / Pigment	Chl <i>b</i>	Chl <i>c</i> ₃	Fuco	Peri	Zea + Lut	Allo	But-fuco	Hex-fuco	Pras	Chl <i>a</i>	*Ref
Prasinophyte 1	0.512	0	0	0	0	0	0	0	0.075	1	2
Prasinophyte 2	0.738	0	0	0	0.008	0	0	0	0	1	2
CHLORO-1	0.339	0	0	0	0.047	0	0	0	0	1	4
Dinoflagellates	0	0	0	0.600	0	0	0	0	0	1	5
Dino-2	0	0.179	0.300	0	0	0	0.081	0.194	0	1	4
Cryptophytes	0	0	0	0	0	0.673	0	0	0	1	2
HAPTO-6	0	0.155	0.195	0	0	0	0.019	1.054	0	1	4
Chryso/Pelagophyte	0	0.114	0.398	0	0	0	0.595	0	0	1	2
Cyanobacteria	0	0	0	0	0.232	0	0	0	0	1	3
Diatoms	0	0	1.229	0	0	0	0	0	0	1	2
Region IV (Western Labrador Sea)											
Class / Pigment	Chl <i>b</i>	Chl <i>c</i> ₃	Fuco	Peri	Zea + Lut	Allo	But-fuco	Hex-fuco	Pras	Chl <i>a</i>	*Ref
Prasinophyte 1	0.512	0	0	0	0	0	0	0	0.075	1	2
Prasinophyte 2	0.738	0	0	0	0.008	0	0	0	0	1	2
CHLORO-1	0.339	0	0	0	0.047	0	0	0	0	1	4
Dino-2	0	0.179	0.300	0	0	0	0.081	0.194	0	1	4
Dinoflagellates	0	0	0	0.600	0	0	0	0	0	1	5
Cryptophytes	0	0	0	0	0	0.673	0	0	0	1	2
Prymnesiophyte 1	0	0.038	0.416	0	0	0	0	1.108	0	1	2
Chryso/Pelagophyte	0	0.114	0.398	0	0	0	0.595	0	0	1	2
Diatoms	0	0	1.229	0	0	0	0	0	0	1	2

¹(Antajan et al., 2004), ²(Vidussi et al., 2004), ³(Muyllaert et al., 2006), ⁴(Higgins et al., 2011), ⁵(Coupel et al., 2015)

Supplemental Material - Table S1. Final ratio matrix of accessory pigment to chlorophyll *a* for distinct algal classes for each cluster group. The root mean square error (RMSE) for the best output runs were < 10%.

Region	I & II (Eastern Labrador Sea)									
Class / Pigment	Chl <i>b</i>	Chl <i>c</i> ₃	Fuco	Peri	Zea + Lut	Allo	But- fuco	Hex- fuco	Pras	Chl <i>a</i>
Prasinophyte 1	0.459	0	0	0	0	0	0	0	0.075	1
Prasinophyte 2	0.650	0	0	0	0.008	0	0	0	0	1
CHLORO-1	0.168	0	0	0	0.040	0	0	0	0	1
Dinoflagellates	0	0	0	0.609	0	0	0	0	0	1
Cryptophytes	0	0	0	0	0	0.785	0	0	0	1
<i>Phaeocystis</i>	0	0.167	0.188	0	0	0	0	0	0	1
HAPTO-6	0	0.199	0.270	0	0	0	0.021	1.261	0	1
Chryso/Pelagophyte	0	0.120	0.454	0	0	0	0.589	0	0	1
Cyanobacteria	0	0	0	0	0.262	0	0	0	0	1
Diatoms	0	0	0.328	0	0	0	0	0	0	1
Region	III & V (Central Labrador Sea)									
Class / Pigment	Chl <i>b</i>	Chl <i>c</i> ₃	Fuco	Peri	Zea +	Allo	But-	Hex-	Pras	Chl <i>a</i>
Prasinophyte 1	0.316	0	0	0	0	0	0	0	0.129	1
Prasinophyte 2	0.716	0	0	0	0.008	0	0	0	0	1
CHLORO-1	0.171	0	0	0	0.025	0	0	0	0	1
Dinoflagellates	0	0	0	0.681	0	0	0	0	0	1
Dino-2	0	0.290	0.348	0	0	0	0.060	0.168	0	1
Cryptophytes	0	0	0	0	0	0.674	0	0	0	1
HAPTO-6	0	0.081	0.202	0	0	0	0.018	1.549	0	1
Chryso/Pelagophyte	0	0.049	0.184	0	0	0	0.264	0	0	1
Cyanobacteria	0	0	0	0	0.142	0	0	0	0	1
Diatoms	0	0	0.512	0	0	0	0	0	0	1
Region	IV (Western Labrador Sea)									
Class / Pigment	Chl <i>b</i>	Chl <i>c</i> ₃	Fuco	Peri	Zea +	Allo	But-	Hex-	Pras	Chl <i>a</i>
Prasinophyte 1	0.216	0	0	0	0	0	0	0	0.078	1
Prasinophyte 2	1.081	0	0	0	0.012	0	0	0	0	1
CHLORO-1	0.113	0	0	0	0.045	0	0	0	0	1
Dino-2	0	0	0	0.785	0	0	0	0	0	1
Dinoflagellates	0	0.028	0.049	0	0	0	0.018	0.040	0	1
Cryptophytes	0	0	0	0	0	0.703	0	0	0	1
Prymnesiophyte 1	0	0.030	0.389	0	0	0	0	1.218	0	1
Chryso/Pelagophyte	0	0.056	0.470	0	0	0	0.613	0	0	1
Diatoms	0	0	0.343	0	0	0	0	0	0	1

Supplemental Material - Figure S1. Mean relative (transformed) concentration (%) of each of the selected pigments (e.g. Fuco) to the total selected pigments (i.e. sum of Fuco + Chl *c*₃ + Hex-fuco + Chl *b* + Peri + Allo + But-fuco + Pras + Zea+Lut). (a). Pigment abbreviations are described in Table 2. Spatial distribution of each cluster (I - V) along the section (km) and throughout the years (2005 – 2014), showing the distance from the star in Figure 3a (b).

