

Table 1-1. *Characteristics of algal chloroplasts and storage products*

Algal class	Chl.	Phycobilins	Carotenoids	Thyl. band <sup>a</sup>	Memb. CER <sup>b</sup>	Place where storage product is found <sup>c</sup>
Cyanophyta	<i>a</i>	C-Phycocyanin, C-phycoerythrin, allophycocyanin, phycoerythrocyanin	$\beta$ -Carotene, zeaxanthin, echinenone, canthaxanthin, mutatochrome, antheraxanthin, $\beta$ -cryptoxanthin, myxoxanthophyll, aphanizophyll, oscillaxanthin	1	—	—
Prochlorophyta	<i>a, b</i>		$\beta$ -Carotene, zeaxanthin	1	—	—
Euglenophyta	<i>a, b</i>		$\beta$ -Carotene, $\gamma$ -carotene, diadinoxanthin, diatoxanthin, neoxanthin, $\beta$ -cryptoxanthin (and its 5',6'-monoepoxide), echinenone, 3-hydroxyechinenone, astaxanthin ester	3	1	—
Dinophyta	<i>a, c_2</i>		$\beta$ -Carotene, peridinin, diadinoxanthin, diatoxanthin, dinoxanthin	3	1	—
Cryptophyta	<i>a, c_2</i>	3 Phycoerythrins, 3 phycocyanins	$\alpha$ -Carotene, $\beta$ -carotene, alloxanthin, crocoxanthin, monadoxanthin	2	2	—
Raphidophyta	<i>a, c</i>		$\beta$ -Carotene, lutein epoxide, antheraxanthin	3	2	—
Chrysophyta	<i>a, c_1, c_2</i>		$\beta$ -Carotene, fucoxanthin, diatoxanthin, diadinoxanthin, echinenone	3	2	—
Prymnesiophyta	<i>a, c_1, c_2</i>		$\beta$ -Carotene, fucoxanthin, diatoxanthin, diadinoxanthin, echinenone	3	2	—
Bacillariophyta	<i>a, c_1, c_2</i>		$\beta$ -Carotene, $\alpha$ -carotene, fucoxanthin, diatoxanthin, diadinoxanthin, neoxanthin	3	2	—
Xanthophyta	<i>a, c</i>		$\beta$ -Carotene, diadinoxanthin, diatoxanthin, heteroxanthin, vaucheriaxanthin ester, neoxanthin, $\beta$ -cryptoxanthin 5',6'-monoepoxide and 5,6',5',6'-diepoxide	3	2	—
Eustigmatophyta	<i>a</i>		$\beta$ -Carotene, violaxanthin, diatoxanthin, heteroxanthin, vaucheriaxanthin ester, neoxanthin, $\beta$ -cryptoxanthin 5',6'-monoepoxide and 5,6',5',6'-diepoxide	3	2	—
Phaeophyta	<i>a, c_1, c_2</i>		$\beta$ -Carotene, fucoxanthin, violaxanthin, zeaxanthin, antheraxanthin, mutatochrome	3	2	—
Rhodophyta	<i>a, d</i>	R-Phycocyanin, R-phycoerythrin, C-phycocyanin, C-allophycocyanin, C-phycoerythrin, b-phycoerythrin, B-phycoerythrin	$\beta$ -Carotene, zeaxanthin, antheraxanthin, $\beta$ -cryptoxanthin, lutein, neoxanthin	1	0	—
Chlorophyta	<i>a, b</i>		$\beta$ -Carotene, lutein, violaxanthin, zeaxanthin, antheraxanthin, neoxanthin, $\beta$ -cryptoxanthin, lutein-5,6-epoxide, loroxanthin, pyrenoxanthin, echinenone, canthaxanthin, 3-hydroxyechinenone ester, adonirubin ester, adonixanthin ester, crustaxanthin ester, astaxanthin ester, phenocopteron	3-6	0	—

<sup>a</sup>Thylakoids per band.<sup>b</sup>Number of membranes of chloroplast endoplasmic reticulum.<sup>c</sup>Place where storage product is found: O, outside chloroplast; I, inside chloroplast; B, between chloroplast envelope and chloroplast endoplasmic reticulum.  
Source: Bisalputra (1974); Ragan (1981).