

Appendix I. Chromosome numbers and nuclear DNA contents in Heterokont algae

Entry number	Species ^(a)	Original ref. for 2n ^(b)	DNA amount				Original ref. for C- value ^(e)	Standard species ^(f)	Method ^(g)
			1C (Mbp) ^(c)	1C (pg) ^(d)	2C (pg) ^(d)	4C (pg) ^(d)			
	BACILLARIOPHYCEAE								
	CHAETOCERALES								
	Chaetoceraceae								
	<i>Chaetoceros muellerii</i> Lemmerman								
	CYMATOSIRALES								
	Cymatosiraceae								
	<i>Minutocellus polymorphus</i> (Hargraves <i>et</i> Guillard)								
	Hasle, von Stosch <i>et</i> Syvertsen								
	NAVICULALES								
	Naviculaceae								
	<i>Navicula pelliculosa</i> (Brebisson <i>ex</i> Kützinger) Hilse								
	Phaeodactylaceae								
	<i>Phaeodactylum tricornutum</i> Bohlin								
	<i>Phaeodactylum tricornutum</i>								
	THALASSIOSIRALES								
	Skeletonemataceae								
	<i>Skeletonema costatum</i> (Greville) Cleve								
	Stephanodiscaceae								
	<i>Cyclotella meneghiniana</i> Kützinger								
	<i>Mitocellus polymorphus</i>								
	Thalassiosiraceae								
	<i>Thalassiosira fluviatilis</i>								
	<i>Thalassiosira pseudonana</i> Hasle <i>et</i> Heimdal								
	<i>Thalassiosira pseudonana</i>								
	<i>Thalassiosira weissflogii</i> (Grunow) Fryxell <i>et</i> Hasle								
	EUSTIGMATOPHYCEAE								
	MISCHOCOCCALES								
	Monopsidaceae								
	<i>Nannochloropsis salina</i> Hibberd								
	Pleurochloridaceae								
	<i>Polyedriella helvetica</i> Vischer <i>et</i> Pascher								
	PELAGOPHYCEAE								

PELAGOMONADALES

Pelagomonadaceae

Pelagomonas calceolata Andersen et Saunders

PHAEOPHYCEAE

CUTLERIALES

Cutleriaceae

1	<i>Cutleria hancockii</i> Dawson			392	0.4	0.8*	1.6	unp	Gallus	MI:DAPI
2	<i>Cutleria multifida</i> (Smith) Greville	50	10	490	0.5	1.0*	2.0	unp	Gallus	MI:DAPI

DESMARESTIALES

Arthrocladiaceae

3a	<i>Arthrocladia villosa</i> (Hudson) Duby	46-54	14	245	0.2	0.5*	1.0	unp	Gallus	MI:DAPI
3b	<i>A. villosa</i>			270	0.3	0.5	1.1*	unp	Gallus	MI:DAPI

Desmarestiaceae

4	<i>Desmarestia aculeata</i> (Linnaeus) Lamouroux			392	0.4	0.8	1.6*	unp	Gallus	MI:DAPI
5	<i>Desmarestia viridis</i> (O. F. Müller) Lamouroux	c.44	16	416	0.4	0.8	1.7*	unp	Gallus	MI:DAPI

DICTYOTALES

Dictyotaceae

6	<i>Dictyota menstrualis</i> (Hoyt) Schnetter, Horning et Weber-Peukert	32	18	539	0.5	1.1	2.2*	unp	Gallus	MI:DAPI
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(=*Dictyota dichotoma* (Hudson) Lamouroux)

7	<i>Dictyopteris polypodioides</i> (De Candolle) Lamouroux (= <i>Dictyopteris membranacea</i> (Stackhouse) Batters)	28-32	6	637	0.6	1.3*	2.6	unp	Gallus	MI:DAPI
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8	<i>Padina durvillaei</i> Bory			637	0.7	1.3*	2.6	unp	Gallus	MI:DAPI
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9	<i>Padina gymnospora</i> (Kützinger) Sonder			882	0.9	1.8	3.5*	unp	Gallus	MI:DAPI
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10	<i>Padina jamaicensis</i> (Collins) Papenfuss			539	0.5	1.1	2.2*	unp	Gallus	MI:DAPI
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11	<i>Padina japonica</i> Yamada			588	0.6	1.2	2.4*	unp	Gallus	MI:DAPI
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ECTOCARPALES¹

12	<i>Acinetospora crinita</i> (Harvey) Kornmann	47	13	245	0.3	0.5	1.0*	unp	Gallus	MI:DAPI
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13	<i>Cladosiphon occidentalis</i> Kylin			172	0.2	0.3	0.7*	unp	Gallus	MI:DAPI
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14	<i>Colpomenia sinuosa</i> (Mertens ex Roth) Derbès et Solier			294	0.3	0.6*	1.2	unp	Gallus	MI:DAPI
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15	<i>Colpomenia phaeodactyla</i> (Dawson) Norris et Wynne			245	0.2	0.5*	1.0	unp	Gallus	MI:DAPI
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16a	<i>Ectocarpus siliculosus</i> (Dillwyn) Lyngbye	42-50	19	245	0.2	0.5*	1.0	unp	Gallus	MI:DAPI
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16b	<i>E. siliculosus</i>						1.0*	unp	Gallus	MI:DAPI
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17a	<i>Hinksia irregularis</i> (Kützinger) Amsler (= <i>Ectocarpus irregularis</i> Kützinger)			98	0.1	0.2*	0.4	unp	Gallus	MI:DAPI
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17b	<i>H. irregularis</i>			98	0.1	0.2	0.4*	unp	Gallus	MI:DAPI
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18a	<i>Hinksia mitchelliae</i> (Harvey) Silva in Silva, Meñez et Moe	36-44	12	343	0.3	0.7*	1.4	unp	Gallus	MI:DAPI
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Table 1. Species of the phylum Rhodophyta (continued)										
	Number of specimens	Number of collections	Number of individuals	Number of collections	Number of individuals	Number of collections	Number of individuals	Number of collections	Number of individuals	Number of collections
(= <i>Giffordia mitchelliae</i> (Harvey) Hamel)										
18b <i>H. mitchelliae</i>			441	0.4	0.8	1.6*	unp	Gallus	MI:DAPI	
19 <i>Hummia onusta</i> (Kützting) Fiore	26	5	294	0.3	0.6	1.1*	unp	Gallus	MI:DAPI	
20 <i>Hydroclathrus clathratus</i> (C. Agardh) Howe			441	0.4	0.9*	1.8	unp	Gallus	MI:DAPI	
21 <i>Petalonia fascia</i> (O. F. Müller) Kützting			245	0.2	0.5*	1.0	unp	Gallus	MI:DAPI	
22 <i>Pilayella littoralis</i> (Linnaeus) Kjellman			250 [†]	0.3	0.52*	1.0	8	Gallus	FC:EB	
23 <i>Punctaria tenuissima</i> (C. Agardh) Greville (= <i>Desmotrichum undulatum</i> (J. Agardh) Reinke)			98	0.1	0.2	0.45*	unp	Gallus	MI:DAPI	
24 <i>Rosenvingea orientalis</i> (J. Agardh) Børgesen			196	0.2	0.4*	0.8	unp	Gallus	MI:DAPI	
25 <i>Scytosiphon lomentaria</i> (Lyngbye) C. Agardh	44	7	245	0.2	0.5*	1.0	unp	Gallus	MI:DAPI	
26a <i>Stilophora rhizodes</i> (Turner) J. Agardh	28-32	17	98	0.1	0.2*	0.4	unp	Gallus	MI:DAPI	
26b <i>S. rhizodes</i>			98	0.1	0.2	0.3*	unp	Gallus	MI:DAPI	
27 <i>Striaria attenuata</i> (C. Agardh) Greville	20	1	147	0.1	0.3	0.6*	unp	Gallus	MI:DAPI	
FUCALES										
Fucaceae										
28 <i>Ascophyllum nodosum</i> (Linnaeus) Le Jolis	64	9	784	0.8	1.7	3.3*	unp	Gallus	MI:DAPI	
29 <i>Fucus vesiculosus</i> Linnaeus	64	2	529	0.5	1.1	2.2*	unp	Gallus	MI:DAPI	
Sargassaceae										
30 <i>Sargassum echinocarpum</i> J. Agardh			319	0.3	0.7	1.3*	unp	Gallus	MI:DAPI	
31 <i>Sargassum filipendula</i> C. Agardh			196	0.2	0.4	0.8*	unp	Gallus	MI:DAPI	
32 <i>Sargassum fluitans</i> Børgesen			196	0.2	0.4	0.8*	unp	Gallus	MI:DAPI	
33 <i>Turbinaria ornata</i> (Turner) J. Agardh			196	0.2	0.4	0.8 *	unp	Gallus	MI:DAPI	
LAMINARIALES										
Alariaceae										
34 <i>Alaria esculenta</i> (Linnaeus) Greville	56	4	686	0.7	1.2	2.5*	unp	Gallus	MI:DAPI	
35 <i>Ecklonia radiata</i> (C. Agardh) J. Agardh			588	0.6	1.3	2.6*	unp	Gallus	MI:DAPI	
36 <i>Undaria pinnatifida</i> (Harvey) Suringar			580 [†]	0.6	1.3*	2.6	8	Gallus	FC:EB	
Laminariaceae										
37 <i>Agarum clathratum</i> Dumortier	c.44	16	588	0.6	1.2	2.0*	unp	Gallus	MI:DAPI	
38a <i>Laminaria digitata</i> (Hudson) Lamouroux	62	4	686	0.7	1.4	2.7*	unp	Gallus	MI:DAPI	
38b <i>L. digitata</i>			640 [†]	0.7	1.4*	2.8	8	Gallus	FC:EB	
38c <i>L. digitata</i>			490	0.5*	1.0	2.0	20		RK	
39a <i>Laminaria saccharina</i> (Linnaeus) Greville	62	3	588	0.6	1.3*	2.6	unp	Gallus	MI:DAPI	
39b <i>L. saccharina</i>			720 [†]	0.8	1.6*	3.2	8	Gallus	FC:EB	
SPHACELARIALES										
40 <i>Sphacelaria rigidula</i> Kützting	50-60	21	882	0.9	1.8*	3.6	unp	Gallus	MI:DAPI	
41 <i>Sphacelaria</i> sp.			775 [†]	0.8	1.7*	3.4	8	Gallus	FC:EB	
42 <i>Sphacelaria</i> sp. 4315			882	0.9*	1.8	3.6	unp	Gallus	MI:DAPI	
SPOROCHNALES										

43	<i>Carpomitra costata</i> (Stackhouse) Batters	c.30	11	392	0.4	0.8	1.6*	unp	Gallus	MI:DAPI
44	<i>Perithalia caudata</i> (Labillardière) Womersley	31-43	15	466	0.5	0.9	1.9	unp	Gallus	MI:DAPI

SYNUROPHYCEAE

CHROMULINALES

Chromulinaceae

Ochromonas danica Pringsheim

XANTHOPHYCEAE

BOTRYDIALES

Botrydiaceae

Botrydium cystosum Vischer

0.4*

RBC

MI:DAPI

MISCHOCOCCALES

Botryochloridaceae

Sphaerosorus composita

0.5*

RBC

MI:DAPI

Ophiocytaceae

Ophiocytium arbuscula (A.Brown) Rabenhorst

0.6*

RBC

MI:DAPI

Ophiocytium capitatum Wolle

0.6*

RBC

MI:DAPI

Pleurochloridaceae

Polyedriella helvetica Vischer et Pascher

0.25*

Charles '77

TRIBONEMATALES

Heteropediaceae

Heterococcus brevicellularis Vischer

0.5*

RBC

MI:DAPI

Heterococcus chodatii Vischer

0.3*

RBC

MI:DAPI

Heterococcus crassulus Vischer

0.3*

RBC

MI:DAPI

Heterococcus fuornensis Vischer

0.3*

RBC

MI:DAPI

Heterococcus protonematoides Vischer

0.4*

RBC

MI:DAPI

Pseudobumilleriopsis pyrenoidosa Deason et Bold

0.5*

RBC

MI:DAPI

Tribonemataceae

Tribonema regulare

0.5*

RBC

MI:DAPI

Tribonema ulotrichoides Pascher

0.2*

RBC

MI:DAPI

Xanthonema solidium (Vischer) P. C. Silva

0.2*

RBC

MI:DAPI

Xanthonema sp.

0.3*

RBC

MI:DAPI

VAUCHERIALES

Vaucheriaceae

Vaucheria repens Hassall

0.3*

RBC

MI:DAPI

Vaucheria synandra Woronin

0.6*

RBC

MI:DAPI

¹ The Ectocarpales, Scytosiphonales, Chordariales and Dictyosiphonales are paraphyletic with respect to each other, forming a highly interwoven clade (Siemer *et al.*, 1998; Kogame *et al.*, 1999). Recently, a formal circumscription of these orders into the Ectocarpales *sensu lato* was proposed (Rousseau and Reviers, 1999a; Rousseau *et al.*, 2001) which left many taxa in strange alliances or as outliers (Draisma *et al.*, 2001). In the present study, taxa were not assigned to specific families as phylogenetic relationships in this order remain unresolved.