

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

Entry number	Species ^(a)	DNA amount					Original ref. for C-value ^(e)	Original ref. for C- species ^(f)	Standard Method ^(g)				
		2n ^(b)	Original ref. for 2n	1C (Mbp) ^(c)	1C (pg) ^(d)	2C (pg) ^(d)							
BACILLARIOPHYCEAE													
CYMATOSIRALES													
Cymatosiraceae													
<i>Minutocellus polymorphus</i> (Hargraves et Guillard)													
Hasle, von stosch et Syvertsen													
NAVICULALES													
Naviculaceae													
<i>Navicula pelliculosa</i> (Brebisson ex Kützing) Hilse													
THALASSIOPHYSALES													
Phaeodactylaceae													
<i>Phaeodactylum tricornutum</i> Bohlin													
<i>Phaeodactylum tricornutum</i>													
MEDIOPHYCEAE													
CHAETOCERALES													
Chaetoceraceae													
<i>Chaetoceros muellerii</i> Lemmerman													
THALASSIOSIRALES													
Skeletonemataceae													
<i>Skeletonema costatum</i> (Greville) Cleve													
Stephanodiscaceae													
<i>Cyclotella meneghiniana</i> Kützing													
Thalassiosiraceae													
<i>Thalassiosira fluviatilis</i>													
<i>Thalassiosira pseudonana</i> Hasle et Heimdal													
<i>Thalassiosira pseudonana</i>													
<i>Thalassiosira weissflogii</i> (Grunow) Fryxell et Hasle													
CHrysophyceAE													
CHROMULINALES													
Chromulinaceae													
<i>Ochromonas danica</i> Pringsheim													
<i>Paraphysomonas</i>													

EUSTIGMATOPHYCEAE											
MISCHOCOCCALES											
Monopsidaceae											
<i>Nannochloropsis salina</i> Hibberd						0.002*			21a		
Pleurochloridaceae											
<i>Polyedriella helvetica</i> Vischer et Pascher						0.25*			2a		
PELAGOPHYCEAE											
PELAGOMONADALES											
Pelagomonadaceae											
<i>Pelagomonas calceolata</i> Andersen et Saunders						0.02*			21a		
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. Müler) Lamouroux	c.44	16			416	0.4	0.8	1.7*	unp	Gallus	MI:DAPI
DICTYOTALES											
Dictyotaceae											
<i>Dictyota ciliolata</i> Kützing							1.4*				MI:DAPI ⁽¹⁾
<i>Dictyota ciliolata</i>											MI:DAPI ⁽¹⁾
<i>Dictyota ciliolata</i>											MI:DAPI ⁽¹⁾
6a <i>Dictyota menstrualis</i> (Hoyt) Schnetter, Horning et Weber-Peukert	32	18			539	0.5	1.1	2.2*	unp	Gallus	MI:DAPI
6b <i>Dictyota menstrualis</i>							1.65*				MI:DAPI ⁽¹⁾
<i>Dictyopteris delicatula</i> Lamouroux							1.48*				MI:DAPI ⁽¹⁾
<i>Dictyopteris delicatula</i>							1.5*	2.7*			MI:DAPI ⁽¹⁾
<i>Dictyopteris delicatula</i>								NV =13.2*			NV
<i>Dictyopteris hoytii</i> Taylor							2.3*				MI:DAPI ⁽¹⁾
<i>Dictyopteris hoytii</i>							2.0*				MI:DAPI
7a <i>Dictyopteris polypodioides</i> (De Candolle) Lamouroux	28-32	6			637	0.6	1.3*	2.6	unp	Gallus	MI:DAPI

7b	<i>Dictyopteris polypodioides</i>						3.1*			MI:DAPI ⁽¹⁾
8	<i>Padina durvillaei</i> Bory		637	0.7	1.3*	2.6	unp	Gallus	MI:DAPI	
9a	<i>Padina gymnospora</i> (Kützing) Sonder		882	0.9	1.8	3.5*	unp	Gallus	MI:DAPI	
9b	<i>Padina gymnospora</i>					4.9*			MI:DAPI ⁽¹⁾	
10	<i>Padina jamaicensis</i> (Collins) Papenfuss		539	0.5	1.1	2.2*	unp	Gallus	MI:DAPI	
11	<i>Padina japonica</i> Yamada		588	0.6	1.2	2.4*	unp	Gallus	MI:DAPI	
	<i>Zonaria tournefortii</i> (Lamouroux) Montagne					2.1*			MI:DAPI ⁽¹⁾	
ECTOCARPALES ¹										
12	<i>Acinetospora crinita</i> (Harvey) Kornmann	47	13	245	0.3	0.5	1.0*	unp	Gallus	MI:DAPI
13	<i>Cladosiphon occidentalis</i> Kylin			172	0.2	0.3	0.7*	unp	Gallus	MI:DAPI
14	<i>Colpomenia sinuosa</i> (Mertens ex Roth) Derbès et Solier		294	0.3	0.6*	1.2	unp	Gallus	MI:DAPI	
	<i>Colpomenia sinuosa</i>					0.32*			MI:DAPI ⁽¹⁾	
15	<i>Colpomenia phaeodactyla</i> (Dawson) Norris et Wynne		245	0.2	0.5*	1.0	unp	Gallus	MI:DAPI	
16a	<i>Ectocarpus siliculosus</i> (Dillwyn) Lyngbye	42-50	19	245	0.2	0.5*	1.0	unp	Gallus	MI:DAPI
16b	<i>E. siliculosus</i>					1.0*	unp	Gallus	MI:DAPI	
17a	<i>Hinksi a irregularis</i> (Kützing) Amsler (<i>=Ectocarpus irregularis</i> Kützing)		98	0.1	0.2*	0.4	unp	Gallus	MI:DAPI	
17b	<i>H. irregularis</i>		98	0.1	0.2	0.4*	unp	Gallus	MI:DAPI	
18a	<i>Hinksi a mitchelliae</i> (Harvey) Silva in Silva, Meñez et Moe (<i>=Giffordia mitchelliae</i> (Harvey) Hamel)	36-44	12	343	0.3	0.7*	1.4	unp	Gallus	MI:DAPI
18b	<i>H. mitchelliae</i>			441	0.4	0.8	1.6*	unp	Gallus	MI:DAPI
19	<i>Hummia onusta</i> (Kützing) 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) Kuntze			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>Scytoniphon 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 Sargassaceae	64	2	529	0.5	1.1	2.2*	unp	Gallus	MI:DAPI

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
	<i>Sargassum filipendula</i>						1.4*			MI:DAPI ⁽¹⁾
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> Kützing	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
	<i>Sporochnus pedunculatus</i> (Hudson) C. Agardh					0.8*				MI:DAPI ⁽¹⁾
	<i>Sporochnus pedunculatus</i>							1.7*		MI:DAPI ⁽¹⁾

PINGUIPHYCEAE

- ? *Phaeomonas*
- ? *Pinguiochrysis*
- ? *Pinguiococcus*

SYNUROPHYCEAE

- ? *Mallomonas*
- ? *Synura*

XANTHOPHYCEAE

BOTRYDIALES

Botrydiaceae						
<i>Botrydium cystosum</i> Vischer			0.4*		RBC	MI:DAPI
MISCHOCOCCALES						
Botryochloridaceae						
<i>Sphaerosorus composita</i>			0.5*		RBC	MI:DAPI
Ophiocytiaeae						
<i>Ophiocytium arbuscula</i> (A.Brown) Rabenhorst			0.6*		RBC	MI:DAPI
<i>Ophiocytium capitatum</i> Wolle			0.6*		RBC	MI:DAPI
Pleurochloridaceae						
<i>Polyedriella helvetica</i> Vischer et Pascher			0.25*	2a		
TRIBONEMATALES						
Heteropediaceae						
<i>Heterococcus brevicellularis</i> Vischer			0.5*		RBC	MI:DAPI
<i>Heterococcus chodatii</i> Vischer			0.3*		RBC	MI:DAPI
<i>Heterococcus crassulus</i> Vischer			0.3*		RBC	MI:DAPI
<i>Heterococcus fuornensis</i> Vischer			0.3*		RBC	MI:DAPI
<i>Heterococcus protonematooides</i> Vischer			0.4*		RBC	MI:DAPI
<i>Pseudobumilleriopsis pyrenoidosa</i> Deason et Bold			0.5*		RBC	MI:DAPI
Tribonemataceae						
<i>Tribonema regulare</i>			0.5*		RBC	MI:DAPI
<i>Tribonema ulotrichoides</i> Pascher	30	17a	0.2*		RBC	MI:DAPI
<i>Xanthonema solidum</i> (Vischer) P. C. Silva			0.2*		RBC	MI:DAPI
<i>Xanthonema</i> sp.			0.3*		RBC	MI:DAPI
VAUCHERIALES						
Vaucheriaceae						
<i>Vaucheria repens</i> Hassall			0.3*		RBC	MI:DAPI
<i>Vaucheria synandra</i> Woronin			0.6*		RBC	MI:DAPI

¹ The Ectocarpales, Scytophionales, 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.

