Appendix I. Chromsome number and nuclear DNA content in species of Chlorophyta

Entry number	Species[a]	2*n*[b]	Original ref. for 2*n*	DNA amount 1C (Mbp)[c]	1C (pg)[d]	2C (pg)[d]	4C (pg)[d]	Original ref. for C-value[e]	Standard species[f]	Method[g]
	Charophycean Green Algae									
	CHARALES									
	Characeae									
1	*Chara aspera* Detharding *ex* Willdenow	28	44	7056	7.2*	14.4	28.8	44	*Allium*	Fe
2	*Chara contraria* Kützing	56	44	19208	19.6*	39.2	78.4	44	*Allium*	Fe
3	*Chara fragilis* Desvaux	56	44	18914	19.3*	38.6	77.2	44	*Allium*	Fe
4a	*Chara tomentosa* Linnaeus	28	44	7252	7.4*	14.8	29.6	44	*Allium*	Fe
4b	*Chara tomentosa* (male)	28	Kun 2001	7252	7.4*	14.8	29.6	Kun 2001	*Chara*	MI:EB
4c	*Chara tomentsoa* (female)	28	Kun 2001	6860	7.0*	14.0	28.0	Kun 2001	*Chara*	MI:EB
5	*Chara vulgaris* Linnaeus	56	44	13230	13.5*	27	54	44	*Allium*	Fe
	CHLOROKYBALES									
6	*Chlorokybus atmosphyticus* Geitler			98	0.1	0.2*	0.4	43		
	COLEOCHAETALES									
	Coleochaetaceae									
7	*Chaetosphaeridium globosum* (Nordstedt) Klebahn					1.2*		*	*Gallus*	MI:DAPI
8	*Coleochaete nitellarum* Jost	84	49	343	0.35	0.7	1.4*	*	*Gallus*	MI:DAPI
9a	*Coleochaete orbicularis* Pringsheim	48	49	98	0.1	0.20*	0.4	43		
9b	*C. orbicularis*			686	0.7	1.5	3.0*	*	*Gallus*	MI:DAPI
10	*Coleochaete scutata* Brébisson			1287	1.3	2.7	5.5*	*	*Gallus*	MI:DAPI
	DESMIDIALES[1]									
	Closteriaceae									
11	*Closterium ehrenbergii* Meneghini *ex* Ralfs	60	19	1323	1.40*	2.70*	5.4	19	*Mus*	MI:DAPI
	Desmidiaceae									
12	*Cosmarium cucumis* Corda	44	39	1960	2.0	4.0*	8	28	*Gallus*	MI:DAPI
13	*Cosmarium subcostatum* Nordstedt	10	16	539	0.6	1.1*	2.2	28	*Gallus*	MI:DAPI
14	*Desmidium swartzii* (C. Agardh) C. Agardh *ex* Ralfs	28	39	735	0.8	1.5*	3	28	*Gallus*	MI:DAPI
15	*Micrasterias americana* Ehrenberg *ex* Ralfs	93	8	10143	10.4[(1)]	20.7*	41.4	28	*Gallus*	MI:DAPI
16	*Micrasterias rotata* Ralfs	160	38	1470	1.5	3.0*	5.3*	28	*Gallus*	MI:DAPI
	KLEBSORMIDIALES									
17a	*Entransia fimbriata* Hughes			245	0.25	0.5*	1.0	43		
17b	*E. fimbriata*			539	0.55	1.1*	2.2	*	*Gallus*	MI:DAPI
18a	*Klebsormidium flaccidum* (Kützing)P.C. Silva, K. Mattox	44	13	98	0.1	0.2*	0.4	43		

	et W.Blackwell									
18b	*K. flaccidum*			198	0.2	0.4*	0.8	*	*Gallus*	MI:DAPI
	MESOSTIGMATALES									
	Mesostigmataceae									
19	*Mesostigma viride* Lauterborn			98	0.1	0.2*	0.4	43		
	Mesostigma viride					0.7*		*	*Gallus*	MI:DAPI
	ZYGNEMATALES									
	Mesotaeniaceae									
20	*Mesotaenia kramstae* Lemmermann			539	0.55	1.1*		*	*Gallus*	MI:DAPI
	Zygnemataceae									
21	*Sirogonium strictum* (J. E. Smith) Kützing	48	54	2058	2.1	4.2*	8.4	28	*Gallus*	MI:DAPI
22a	*Spirogyra communis* (Hassall) Kützing UTEX 2465	24	23	2009	2.1	4.1*	8.2	28	*Gallus*	MI:DAPI
22b	*Spirogyra communis* (Hassall) Kützing UTEX 2466	12	23	1960	2.0	4.0*	8	28	*Gallus*	MI:DAPI
23	*Zygnema circumcarcinatum* Czurda	c.19	47	245	0.25	0.5*	1	28	*Gallus*	MI:DAPI
24	*Zygnema cylindricum* Transeau	70	47	343	0.35	0.7*	1.4	28	*Gallus*	MI:DAPI
	Chlorophycean Green Algae									
	CHLOROCOCCALES									
	Coccomyxaceae									
	Nannochloris atomus Butcher									
25	*Nannochloris bacillaris* Naumann	14	1	98	0.1	0.2*		1		PFGE
	Scenedesmaceae									
26	*Scenedesmus obliquus* (Turpin) Kuetzing	12	49	196	0.2	0.40*		12		MFA
	VOLVOCALES[2]									
	Chlamydomonaceae									
	Brachiomonas sp.									
27	*Chlamydomonas reinhardtii* P. A. Dangeard	16	9	88	0.09	0.19*		10		
28	*Dunaliella tertiolecta* Butcher			294	0.3	0.6*		22		
	Dunaliella tertiolecta									
	Volvocaceae									
29	*Pleodorina californica* Shaw			78	0.08	0.17*		53		
	(=Eudorina californica)	28	11							
30	*Volvox carterii* F. Stein	c.44	11	98	0.1	0.2*		43		
	Prasinophycean Green Algae									
	CHLORODENDRALES									
	Halosphaeraceae									
	Micromonas pusilla (Butcher) Manton et Parke				0.06	0.03*		49a		FC
	Micromonas pusilla				0.054	0.027*		53a		FC

	MAMIELLALES									
	Mamiellaceae									
	Bathycoccus prasinos Eikrem *et* Throndsen				0.04	0.02		49a		FC
31	*Ostreococcus tauri* C.Courties *et* M.-J.Chretiennot-Dinet	28	16	102†	0.05	0.1		16		PFGE
	Prasinophyceae									
32	*Pyramimonas parkeae* Norris *et* Pearson			67	0.07	0.15*		*	*Gallus*	MI:DAPI
33	*Tetraselmis striata* Butcher			98	0.1	0.2*		43		
34	*Tetraselmis suecica* (Kylin) Butcher			343	0.35	0.7*		*	*Gallus*	MI:DAPI
	Trebouxiophycean Green Algae									
	CHLORELLALES[3]									
	Trebouxiophyceae									
35	**Chlorella ellipsoidea* Gerneck	18	20	400†	0.41	0.82		20		PFGE
36	*Chlorella fusca var. vacuolata* Shihira *et* Krauss			521†	0.53	1.06		17		RK
37	*Chlorella homosphaera* Skuja			418†	0.2	0.4		17		RK
38	*Chlorella kessleri* Fott *et* Nováková			196†	0.2	0.4		17		RK
39	*Chlorella lobophora* Andreeva			426†	0.43	0.86		17		RK
40	**Chlorella luteoviridis* Chodat			593†	0.6	1.2		17		RK
41	**Chlorella minutissima* Fott *et* Novakova			126†	0.13	0.26		17		RK
42	**Chlorella mirabilis* Andreeva			98†	0.1	0.2*		17		RK
43	*Chlorella protothecoides* Krüger			195†	0.2	0.4		17		RK
44	**Chlorella saccharophila var. ellipsoidea (Gerneck)* Fott *et* Nováková			808†	0.8	1.6		17		RK
45	*Chlorella saccharophila var. saccharophila (*Krüger) Migula, Fott *et* Nováková			394†	0.4	0.8		17		RK
46a	*Chlorella sorokiana* Shihira *et* Krauss			49	0.05	0.11*		10		MFA
46b	*Chlorella sorokiana*			597†	0.61	1.2		17		RK
47a	*Chlorella vulgaris* M. Beijerinck	16	20	400†	0.41	0.82		20		
47b	*Chlorella vulgaris*			140†	0.14	0.28		17		RK
48	**Chlorella zofingiensis* Dönz			413†	0.4	0.8		17		RK
	Nanochlorum eucaryotum Wilhem, Eisenbeis, Wild *et* Zahn				0.06*			56a		FC
49	*Prototheca wickerhamii* Soneda *et* Tubaki			196	0.2	0.4*		43		
	PRASIOLALES									
	Prasiolaceae									
	Prasiola stipitata Suhr *in* Jessen	16	C&A'63			0.45	0.9*	*	Gallus	MI:DAPI
	Ulvophycean Green Algae									
	CAULERPALES									
	Bryopsidaceae									
50	*Bryopsis hypnoides* Lamouroux	20	36	490	0.5	1.0*	2	36	*Imp.*	MI:H

51	*Bryopsis pennata* Lamouroux	20	36	343	0.35	0.7*	1.4	36	*Imp.*	MI:H
52	*Bryopsis plumosa* (Hudson) C. Agardh	20	36	343	0.4	0.8*	1.6	28	*Gallus*	MI:DAPI
53	*Derbesia marina* (Lyngbye) Solier	16	45	197	0.2	0.4	0.9*	28	*Gallus*	MI:DAPI
54	*Derbesia tenuissima* (De Notaris) Crouan frat.	16	45	197	0.2	0.4	0.8*	28	*Gallus*	MI:DAPI
55	*Ostreobium queketii* Bornet *et* Flahault				0.2	0.4	0.9*	28	*Gallus*	MI:DAPI
56	*Pedobesia lamourouxii* (J. Agardh) Feldmann, Loseau, Codomier *et* Couté			196	0.2	0.4*	0.8	27	*Gallus*	MI:DAPI
57	*Trichosolen duchessangii* (J. Agardh) W. R. Taylor			118	0.12	0.24*	0.5	27	*Gallus*	MI:DAPI
	Caulerpaceae									
58	*Caulerpa mexicana* Sonders *ex* Kützing			98	0.1	0.20*	0.4	27	*Gallus*	MI:DAPI
59	*Caulerpa paspaloides* (Bory) Greville			88	0.09	0.26*	0.65*	27	*Gallus*	MI:DAPI
60	*Caulerpa prolifera* (Forsskål) Lamouroux			147	0.15	0.3*	0.6*	27	*Gallus*	MI:DAPI
61	*Caulerpa verticillata* J. Agardh			78	0.08	0.17*	0.34	27	*Gallus*	MI:DAPI
	Codiaceae									
62	*Codium arabicum* Kützing			490	0.52	1.03*	2.1	27	*Gallus*	MI:DAPI
63	*Codium carolinianum* Searles			2695	2.7	5.5*	11.0	27	*Gallus*	MI:DAPI
64	*Codium decorticatum* (Woodward) Howe	20	37	588	0.6	1.2*	2.4*	27	*Gallus*	MI:DAPI
65a	*Codium fragile* subsp. *tomentosoides (van Goor) P. C. Silva*	20	34	3430	3.5*	6.1*	14.2*	27	*Gallus*	MI:DAPI
65b	*Codium fragile subsp. tomentosoides*							*	*Gallus*	MI:DAPI
	Udotaceae									
66	*Halimeda macrophysa* Askanasy			1470	1.5*	3.1*	6.4*	27	*Gallus*	MI:DAPI
	CLADOPHORALES/SIPHONOCLADALES COMPLEX[4]									
67	*Anadyomene stellata* (Wulfen) C. Agardh	16	18	1470	1.5*	[(1)]2.6*	5.2	35	*Gallus*	MI:DAPI
68	*Boergesenia forbesii* (Harvey) J. Feldmann	36	50	2646	2.7*	4.9*	9.5*	35	*Gallus*	MI:DAPI
69	*Boodlea composita* (Harvey) Brand	22-24	3	1862	1.9	[(1)]3.8*	7.6	35	*Gallus*	MI:DAPI
70	*Chaetomorpha aerea* (Dillwyn) Kützing	24	21	98	0.1	0.20*	0.4	21	*Ant.*	MI:H
71	*Chaetomorpha antennina* (Bory) Kützing	24	21	255	0.26	0.53*	1.0	21	*Ant.*	MI:H
72	*Chaetomorpha brachygona* Harvey	24	21	128	0.13	0.26*	0.6	21	*Ant.*	MI:H
73	*Chaetomorpha gracilis* Kützing				0.7	1.4	2.8*	28	*Gallus*	MI:DAPI
74	*Chaetomorpha melagonium* (Weber *et* Mohr) Kützing	24	3	284	0.29	0.58*	1.2	21	*Ant.*	MI:H
75a	*Cladophora albida* (Hudson) Kützing	24	32	372	0.4	0.7-0.8*	1.6	5		RK
75b	*C. albida*			345	0.35	0.7	1.4*	21	*Ant.*	MI:H
76	*Cladophora coelothrix* Kützing					2.9			*Gallus*	MI:DAPI
77	*Cladophora laetevirens* (Dillwyn) Kützing	24	33	294	0.3*	0.6	1.2	6		RK
78	*Cladophora pellucida* (Hudson) Kützing			490	0.5 *	1.02	2.0	7		RK
79	*Cladophora rupestres (*L.) Kützing	24	56	294	0.3	0.64	1.2	4		RK
80	*Cladophora prolifera* (Roth) Kützing			1127	1.2	2.4	4.8	28	*Gallus*	MI:DAPI
81	*Cladophora sericea* (Hudson) Kützing	24	56	294	0.3 *	0.64	1.2	4		RK
82	*Cladophora vagabunda* (L.) van den Hoek	24	32	392	0.4 *	0.86	1.8	6		RK
83	*Cladophoropsis macromeres* W. R.Taylor	32	35	1960	2.0	4.0*	8.4	35	*Gallus*	MI:DAPI

84a	*Cladophoropsis membranacea* (C. Agardh) Børgesen	32	35	2058	2.1*	4.5*	9.0*	35	*Gallus*	MI:DAPI
84b	*C. membranacea*			933[†]	1.0*	2.04	4	40		RK
85a	*Dictyosphaeria cavernosa* Børgesen			1127	1.15	2.3*	4.3*	46	*Gallus*	MI:DAPI
85b	*D. cavernosa*			1764	1.8*	3.58	7.2	44		RK
86	*Dictyosphaeria ocellata* (Howe) Olsen-Stojkovich			2524	2.58	[(1)]5.1	10.3*	35	*Gallus*	MI:DAPI
87	*Microdictyon marinum* (Børgesen) P. C. Silva			1960	2.0*	3.8*	8.6*	35	*Gallus*	MI:DAPI
88	*Pithophora sp.* (UTEX 1333)			882	0.9	1.9	3.8*	*	*Gallus*	MI:DAPI
89	*Siphonocladus tropicus* (P. Crouan *et* H. Crouan *ex* Maze *et* Schramm) J. Agardh			1078	1.1*	2.0 *	4.4*	35	*Gallus*	MI:DAPI
90	*Valonia macrophysa* Kützing			2450	2.5	[(1)]5.1	10.2*	35	*Gallus*	MI:DAPI
91	*Valonia utricularis* (Roth) C. Agardh	22-28	2	2793	2.85	[(1)]5.7	11.4*	35	*Gallus*	MI:DAPI
92	*Valonia ventricosa* (J. Agardh) Olsen *et* West			2058	2.1	[(1)]4.2	8.4*	35	*Gallus*	MI:DAPI
	DASYCLADALES[5]									
	Dasycladaceae									
93	*Batophora oerstedii* J. Agardh	32	48	686	0.7	1.4*	2.8	30	*Gallus*	MI:DAPI
94	*Bornetella nitida* (Harvey) Munier-Chalmas			588	0.6	1.2*	2.4	30	*Gallus*	MI:DAPI
95	*Bornetella sphaerica* (Zanardini) Solms-Laubach			588	0.6	1.2*	2.4	30	*Gallus*	MI:DAPI
96	*Chlorocladus australaxicus Sonder*			588	0.6	1.2*	2.4	28	*Gallus*	MI:DAPI
97	*Cymopolia barbata* (L.) Lamouroux	14	55	343	0.35	0.7*	1.4	30	*Gallus*	MI:DAPI
98	*Halicoryne wrightii* Harvey			931	0.95	1.9*	3.8	30	*Gallus*	MI:DAPI
99	*Neomeris annulata* Dickie			588	0.6	1.2*	2.4	30	*Gallus*	MI:DAPI
100	*Neomeris van bosseae* Howe	40	26	588	0.6	1.2*	2.4	30	*Gallus*	MI:DAPI
	Polyphysaceae (=Acetabulariaceae)									
101	*Acetabularia acetabulum* (L.) P. C. Silva [as *A. mediterranea* Lamouroux]	40-48	51	882	0.9	1.8*	3.6	50	*Betta*	FC:PI
102a	*Acetabularia crenulata* Lamouroux			882	0.9	1.8*	3.6	30	*Gallus*	MI:DAPI
102b	*Acetabularia crenulata*			784	0.8	1.7*	3.4	28	*Gallus*	MI:DAPI
103	*Acetabularia dentata* Solms-Laubach			784	0.8	1.6*	3.2	30	*Gallus*	MI:DAPI
104	*Acetabularia major* Martens			1176	1.2	2.4*	4.8	30	*Gallus*	MI:DAPI
105	*Acicularia schenckii* (Mobius) Solms-Laubach			1764	1.8	3.7*	7.4	28	*Gallus*	MI:DAPI
106	*Polyphysa clavata* (Yamada) Schnetter *et* Bula-Meyer			490	0.5	1.0*	2.0	30	*Gallus*	MI:DAPI
107	*Polyphysa parvula* (Solms-Lauback) Schnetter *et* Bula-Meyer [as *Acetabularia moebii* Solms-Laubach]	36	26	441	0.45	0.9*	1.8	30	*Gallus*	MI:DAPI
108	*Polyphysa peniculus* (R. Brown *ex* Turner) C. Agardh			1274	1.3	2.7*	5.4	28	*Gallus*	MI:DAPI
	TRENTEPOHLIALES									
	Trentepohliaceae									
109	*Cephaleuros parasiticus* Karsten			1911	1.95	3.9*	7.2	42	*Gallus*	MI:DAPI

110 *Cephaleuros virescens* Kunze in Fries	36	24	980	1.0	2.0*	4.0	42	*Gallus*	MI:DAPI
111 *Physolinum monile* (De Wildeman) Printz	22	14	2009	2.05	4.1*	8.2	42	*Gallus*	MI:DAPI
112 *Trentepohlia arborum* (Agardh) Hariot			1470	1.5	3.0*	6.0	42	*Gallus*	MI:DAPI
113 *Trentepohlia aurea* (L.) Martens	32,34	52	588	0.6	1.2*	2.4	42	*Gallus*	MI:DAPI
114 *Trentepohlia odorata* (Wiggers) Wittrock			539	0.55	1.1*	2.2	42	*Gallus*	MI:DAPI
ULOTRICHALES[6]									
Incertae sedis									
115 *Gleotilopsis sterilis* Deason			108	0.11	0.23*	0.46	*	*Gallus*	MI:DAPI
116 *Halochlorococcum moorei* (N.L.Gardner) Kornmann *et* Sahling			98	0.1	0.2*	0.4	43		
117 *Pseudendoclonium basilense* Vischer			167	0.17	0.34*	0.68	*	*Gallus*	MI:DAPI
Acrosiphoniaceae									
118 *Spongomorpha arcta* (Dillwyn) Kützing	12		304	0.3	0.6*	1.2	28	*Gallus*	MI:DAPI
Monostromaceae									
119 *Capsosiphon fulvescens* (C.Agardh) Setchell *et* N.L.Gardner			157	0.16	0.33*	0.6	*	*Gallus*	MI:DAPI
120 *Monostroma grevillei* (Thuret) Wittrock	12		255	0.26	0.5*	1.0	28	*Gallus*	MI:DAPI
Ulotrichaceae									
121 *Ulothrix flacca* (Dillwyn) Thuret *in* Le Jolis	18		441	0.45	0.9*	1.8	28	*Gallus*	MI:DAPI
ULVALES[7]									
Incertae sedis									
122 *Acrochaete endozoica* (M. Goldberg, J.C. Makemson *et* S.B.Colley) M.J.Wynne			98	0.1	0.2*	0.4	43		
123 *Blidingia marginata* (J. Agardh) P. Dangeard	16	29	372	0.38	0.7*	1.4	29	*Ant.*	MI:H
124 *Blidingia minima* (Nägeli *ex* Kützing) Kylin	16	29	441	0.44	0.9*	1.8	29	*Ant.*	MI:H
125 *Bulbocoleon piliferum* Pringsheim			98	0.1	0.2*	0.4	43		
126 *Pseudendoclonium basilense* Vischer			196	0.17	0.34*	0.6	*	*Gallus*	MI:DAPI
Ulvaceae									
127 *Enteromorpha clathrata*									
128 *Enteromorpha compressa* (Linnaeus) Greville	20	32	120†	0.1 *	0.2	0.4	41	*Gallus*	FC:EB
129 *Enteromorpha linza* (Linnaeus) J. Agardh	20	31	294	0.29	0.6*	1.2	29	*Ant.*	MI:H
130 *Enteromorpha prolifera* (O.F. Miller) J. Agardh	20	25	588	0.55	1.1*	2.2	29	*Ant.*	MI:H
131 *Percursaria percursa* (C.Agardh) Rosenvinge			294	0.3	0.6*	1.2	*	*Gallus*	MI:DAPI
132 *Ulva curvata* (Kützing) DeToni	24	29	343	0.37	0.7*	1.4	29	*Ant.*	MI:H
133 *Ulva fasciata* Delile	20	29	294	0.29	0.58*	1.2	29	*Ant.*	MI:H
134 *Ulva rigida* C. Agardh	20	41	150†	0.16*	0.32	0.6	29	*Gallus*	FC:EB
[as *U. lactuca* Linnaeus var. *rigida* (C. Agardh) LeJolis]									
Ulva rotundata Bliding					0.6*			*Gallus*	MI:DAPI
135 *Ulvaria oxysperma* (Kützing) Bliding	12	31	343	0.34	0.68	1.4	28	*Gallus*	MI:DAPI
[as *Gayralia oxysperma* (Kützing) Vinogradova]									

[1] Traditional taxonomic lists often grouped all conjugating green algae within one order, the Zygnematales (Conjugales) (Bold and Wynne, 1985). Results of recent molecular studies support recognition of two orders, the Desmidiales and the Zygnematales (McCourt *et al*., 2000; Denboh *et al*., 2001).

[2] Molecular data demonstrate that *Chlamydomonas* and *Volvox* are non-monophyletic (Nozaki *et al*. 2000; Nozaki and Krienitz, 2001) and that revision of the circumscription of these genera will be required (Larson *et al.*, 11992). Dunalliella tertiolecta, included here in the Chlamydomonaceae, is part of a polyphyletic complex that may warrant recognition as a separate order (Nakayama *et al*., 1966).

[3] Recent molecular studies have demonstrated that *Chlorella* taxa are dispersed over two classes: the Trebouxiophyceae and the Chlorophyceae (Krienitz *et al*., 2004). Chlorellales included here are considered to be Trebouxiophycean algae (Huss *et al*., 1999).

[4] Molecular data clearly demonstrate that classifications of the genus *Cladophora* should be revised (Hanyuda *et al*., 2002). Circumscription of families in this complex will require sequence data for additional cladophoralean algae.

[5] Recent molecular investigations indicate that genera of the Dasycladaceae are well delineated, but this does not hold true for genera of the Polyphysaceae (= Acetabulariaceae). 18S rDNA data support transfer of *Acicularia schenckii* and *Polyphysa peniculus* to the genus *Acetabularia* (Berger *et al*., 2003).The familiar binomials are retained here for convenience until a complete taxonomic revision of the Dasycladales is available.

[6] Recent phylogenetic investigations have redefined the boundary between the Ulotrichales and Ulvales (O'Kelly *et al*., 2004). Species of *Monostroma* appear to be more closely related to the Ulotrichales than to the Ulvales (Hayden and Waaland, 2002). No contemporary characterization of families is available for this newly circumscribed order.

[7] Characters used to separate the genera *Ulva* and *Enteromorpha* lack taxonomic significance (Tan *et al*., 1999; Shimada *et al*., 2003). The familiar binomials have been retained here in the absence of formal reassignment of species (Hayden and Waaland, 2003, 2004). Exact placement of *Blidingia* in the Ulvales remains uncertain (*Insertae sedis*) as no contemporary characterization of the ammended family Monostromaceae is available.