Dataset S7. Dark respiration rates in cyanobacteria

Notes to Table **S7**:

Data on dark respiration rates in cyanobacteria (unicellular, filamentous and mat-forming species) are presented. Taxonomic status (the **“Order”** column) was determined for each genus following www.algaebase.org .

Abbreviations and universal conversions: DM – dry mass; WM – wet mass; N – nitrogen mass; Chl a – Chl a mass; C – carbon mass; Pr – protein mass; X/Y – X by Y mass ratio in the cell, e.g. DM/WM is the ratio of dry to wet cell mass; 1 W = 1 J s^{-1}; 1 mol O_2 = 32 g O_2.

Column **“U”** (mass units of respiration rate measurements): D – dry mass or Chl a mass with known Chl a/DM ratio; W – wet mass without information on DM/WM ratio; Chl – chlorophyll mass without information on Chl a/DM ratio; Pr – protein mass.

“Original units” are the units of dark respiration rate measurements as given in the original publication (**“Source”**); **qou** is the numeric value of dark respiration rate in the original units. E.g., if it is “mg O_2 (g DM)$^{-1}$ hr^{-1}” in the column **“Original units”** and “1.1” in the column **“qou”**, this means that dark respiration rate of the corresponding species, as given in the original publication indicated in the column **“Source”**, is 1.1 mg O_2 (g DM)$^{-1}$ hr^{-1}.

qWkg is the original dark respiration rate **qou** converted to W (kg WM)$^{-1}$ (Watts per kg wet mass) using the following conversion factors: C/DM = 0.5 (Kratz & Myers 1955; Bratbak & Dundas 1984; Gordillo et al. 1999; Stal & Moezelaar 1997), Chl a/DM = 0.015 (APHA 1992), Pr/DM = 0.5 (Otte et al. 1999; Zubkov et al. 1999; Stal & Moezelaar 1997) and DM/WM = 0.3 as a crude mean for all taxa applied in the analysis (SI Methods, Table S12a). If the Chl a/DM ratio is known (shown in the **“Comments”** column), while **qou** is per unit Chl a mass, the dark respiration rate is first calculated per unit dry mass and then converted to **qWkg** using the reference DM/WM = 0.3. Energy conversion: 1 ml O_2 = 20 J.

TC is ambient temperature during measurements, degrees Celsius.

q25Wkg is dark respiration rate converted to 25 °C using Q_{10} = 2, **q25Wkg** = **qWkg** $\times 2^{(25 - TC)/10}$, dimension W (kg WM)$^{-1}$. For each species rows are arranged in the order of increasing **q25Wkg**.

Mpg: estimated cell mass, pg (1 pg = 10^{-12} g). In most cases it is estimated from linear dimensions (using geometric mean of the available linear size range) assuming spherical cell shape. For filamentous cyanobacteria **Mpg** is estimated from linear width as if it were a spherical cell of the same diameter, to be comparable to unicellular species. As argued in the paper, for plant it is the minimal linear size (e.g., leaf thickness) rather than total mass that is energetically relevant. Square brackets around **Mpg** value indicate that this value was obtained from a different source than the source of dark respiration rate data. When converting cell volume to cell mass, cell density of 1 g ml^{-1} was assumed.

Source: the first, unbracketed reference in this column is where the value of **qou** is taken from; references and data in square brackets refer to cell size determination.

Comments: this column provides relevant information on culture conditions and cellular composition of the studied species. C/N — carbon to cell nitrogen mass ratio; C/DM — carbon mass to dry mass ratio; DM/WM — dry mass to wet mass ratio; DM/V — dry mass to volume ratio (pg/μm^3); C/Chl — carbon to chlorophyll mass ratio; C/V — carbon mass to cell volume ratio (pg/μm^3); C/cell — C per cell (pg/cell); Pr/cell — pg protein per cell (pg/cell); AFDM/WM — ash-free dry mass to wet mass ratio; ODM — organic dry matter.

Log_{10}-transformed values of **q25Wkg** (W (kg WM)$^{-1}$), minimum for each species, were used in the analyses shown in Figures 1 and 2 and Table 1 in the paper (a total of 25 values for n = 25 species). The corresponding rows are highlighted in blue.

References within Table **S7** to Tables, Figures etc. refer to the corresponding items in the original literature indicated in the **Source** column.

Table **S7**. Dark respiration rates in cyanobacteria.

Species	U	Original units	qou	qWkg	q25Wkg	TC	Mpg	Order	Source	Comments
1. Anabaena flos-aquae	Chl	μmol O_2 (mg Chl)$^{-1}$ hr^{-1}	2.4	1.3	1.30	25	[22]	Nostocales	Rubin et al. 1977 [estimated from images at UTEX Culture Collection (http://www.zo.utexas.edu/research/utex/), diam 3.5 μm, filamentous]	
2. Anabaena variabilis	D	μl O_2 (mg DM)$^{-1}$ hr^{-1}	1.7	2.8	1.06	39	[14]	Nostocales	Kratz & Myers 1955 [estimated from image of ATCC 29413, diam 3 μm, filamentous, displayed at http://www.ibvf.cartuja.csic.es/Cultivos/Seccion_IV.htm (Instituto de Bioquímica Vegetal y Fotosíntesis, Cevilla, Spain)]	Cells stored in darkness for 24 hr before measurements

3. Anabaena variabilis	D	μl O_2 (mg DM)$^{-1}$ hr^{-1}	8.4	14	5.31	39	[14]	Nostocales	Kratz & Myers 1955 [estimated from image of ATCC 29413, diam 3 μm, filamentous, displayed at http://www.ibvf.cartuja.csic.es/Cultivos/Seccion_IV.htm (Instituto de Bioquímica Vegetal y Fotosíntesis, Cevilla, Spain)]	growing cells ($\log_{10}$k/day= 0.55) harvested and prepared for dark respiration measurements in less than 35 min
4. Anabaena variabilis	Pr	μmol O_2 (95 mg protein)$^{-1}$ hr^{-1}	93	18	19.29	24	[14]	Nostocales	Haury & Spiller 1981 [estimated from image of ATCC 29413, diam 3 μm, filamentous, displayed at http://www.ibvf.cartuja.csic.es/Cultivos/Seccion_IV.htm (Instituto de Bioquímica Vegetal y Fotosíntesis, Cevilla, Spain)]	protein/packed cell volume=95 mg/ml Chl/packed cell volume=3.4 mg/ml; carbon-starved; respiration is characterized as "high" compared to the strain studied by Kratz & Myers (1955)
5. Anacystis nidulans PCC 6301 (Synechococcus leopoliensis)	D	μl O_2 (mg DM)$^{-1}$ hr^{-1}	0.3	0.5	0.50	25	[4]	Chroococcales	Kratz & Myers 1955 [estimated from linear dimensions 1.6×2.2 μm assuming cylindrical form]	C/DM=0.483 H/DM=0.067 N/DM=0.094 ash/DM=0.044 [when grown at $\log_{10}$k/day=1.0]; cells stored in darkness for 24 hr before measurements
6. Anacystis nidulans PCC 6301 (Synechococcus leopoliensis)	D	μl O_2 (mg DM)$^{-1}$ hr^{-1}	1.9	3.2	1.21	39	[4]	Chroococcales	Kratz & Myers 1955 [estimated from linear dimensions 1.6×2.2 μm assuming cylindrical form]	C/DM=0.483 H/DM=0.067 N/DM=0.094 ash/DM=0.044 [when grown at $\log_{10}$k/day=1.0]; cells stored in darkness for 24 hr before measurements
7. Anacystis nidulans PCC 6301 (Synechococcus leopoliensis)	D	μl O_2 (mg DM)$^{-1}$ hr^{-1}	1.6	2.7	2.70	25	[4]	Chroococcales	Kratz & Myers 1955 [estimated from linear dimensions 1.6×2.2 μm assuming cylindrical form]	C/DM=0.483 H/DM=0.067 N/DM=0.094 ash/DM=0.044 [when grown at $\log_{10}$k/day=1.0]; growing cells ($\log_{10}$k/day= 0.3) harvested and prepared for dark respiration measurements in less than 35 min
8. Anacystis nidulans PCC 6301 (Synechococcus leopoliensis)	D	μl O_2 (mg DM)$^{-1}$ hr^{-1}	4.7	7.8	2.96	39	[4]	Chroococcales	Kratz & Myers 1955 [estimated from linear dimensions 1.6×2.2 μm assuming cylindrical form]	C/DM=0.483 H/DM=0.067 N/DM=0.094 ash/DM=0.044 [when grown at $\log_{10}$k/day=1.0]; growing cells ($\log_{10}$k/day= 0.55) harvested and prepared for dark respiration measurements in less than 35 min

9. Anacystis nidulans PCC 6301 (Synechococcus leopoliensis)	D	μl O_2 (mg DM)$^{-1}$ hr^{-1}	7.5	12.5	4.74	39	[4]	Chroococcales	Kratz & Myers 1955 [estimated from linear dimensions 1.6×2.2 μm assuming cylindrical form]	C/DM=0.483 H/DM=0.067 N/DM=0.094 ash/DM=0.044 [when grown at $\log_{10}$k/day=1.0]; growing cells ($\log_{10}$k/day= 2.50) harvested and prepared for dark respiration measurements in less than 35 min
10. Anacystis nidulans PCC 6301 (Synechococcus leopoliensis)	D	μl O_2 (mg DM)$^{-1}$ hr^{-1}	2.9	4.8	4.80	25	[4]	Chroococcales	Kratz & Myers 1955 [estimated from linear dimensions 1.6×2.2 μm assuming cylindrical form]	C/DM=0.483 H/DM=0.067 N/DM=0.094 ash/DM=0.044 [when grown at $\log_{10}$k/day=1.0]; cells stored in darkness for 24 hr before measurements
11. Anacystis nidulans PCC 6301 (Synechococcus leopoliensis)	Chl	μmol O_2 (mg Chl)$^{-1}$ hr^{-1}	32	18	6.36	40	[4]	Chroococcales	Romero et al. 1989 [estimated from linear dimensions 1.6×2.2 μm (Kratz & Myers 1955) assuming cylindrical form]	nitrogen-deprived cells
12. Anacystis nidulans PCC 6301 (Synechococcus leopoliensis)	Chl	μmol O_2 (mg Chl)$^{-1}$ hr^{-1}	41	23	8.13	40	[4]	Chroococcales	Romero et al. 1989 [estimated from linear dimensions 1.6×2.2 μm (Kratz & Myers 1955) assuming cylindrical form]	KNO_3 added
13. Anacystis nidulans PCC 6301 (Synechococcus leopoliensis)	D	μl O_2 (mg DM)$^{-1}$ hr^{-1}	4.3-5.9	8.5	8.50	25	[4]	Chroococcales	Biggins 1969 [estimated from linear dimensions 1.6×2.2 μm (Kratz & Myers 1955) assuming cylindrical form]	stable respiration during 8 hr in darkness
14. Anacystis nidulans PCC 6301 (Synechococcus leopoliensis)	D	μl O_2 (mg DM)$^{-1}$ (40 min)$^{-1}$	10	25	9.47	39	[4]	Chroococcales	Doolittle & Singer 1974, Fig. 6 [estimated from linear dimensions 1.6×2.2 μm (Kratz & Myers 1955) assuming cylindrical form]	DM/cell=1.1 pg; cells harvested in log-phase
15. Anacystis nidulans PCC 6301 (Synechococcus leopoliensis)	Chl	μmol O_2 (mg Chl)$^{-1}$ hr^{-1}	51	29	10.25	40	[4]	Chroococcales	Romero et al. 1989 [estimated from linear dimensions 1.6×2.2 μm (Kratz & Myers 1955) assuming cylindrical form]	NH_4Cl added
16. Aphanocapsa PCC 6714	W	nmol O_2 (mg WM)$^{-1}$ min^{-1}	<0.02	0.15	0.15	25	[10]	Synechoccocales	Pelroy & Bassham 1973 [Stanier et al. 1971, Fig. 6]	stabilized respiration of cells harvested during late-log phase
17. Coccochloris peniocystis	Chl	μmol O_2 (mg Chl)$^{-1}$ hr^{-1}	32.3	18	6.36	40	[1]	Chroococcales	Coleman & Colman 1980 [Stanier et al. 1971, Fig. 2 PCC 6307, ellipsoid 1×2 μm]	
18. Coccochloris peniocystis	Chl	μmol O_2 (mg Chl)$^{-1}$ hr^{-1}	24.4	14	9.90	30	[1]	Chroococcales	Coleman & Colman 1980 [Stanier et al. 1971, Fig. 2 PCC 6307, ellipsoid 1×2 μm]	

19. Coccochloris peniocystis	Chl	μmol O_2 (mg Chl)$^{-1}$ hr^{-1}	15.2	8.5	12.02	20	[1]	Chroococcales	Coleman & Colman 1980 [Stanier et al. 1971, Fig. 2 PCC 6307, ellipsoid 1×2 μm]	
20. Gloeobacter violaceus	Chl	μmol O_2 (mg Chl)$^{-1}$ hr^{-1}	50	28	28.00	25	[0.7]	Chroococcales	Koenig & Schmidt 1995 [Pasteur Culture Collection, www.pasteur.fr, width/diameter 1-1.2 μm]	
21. Gloeothece sp. PCC 6909	Pr	μmol O_2 (mg protein)$^{-1}$ hr^{-1}	0.208	4	5.66	20	[180]	Chroococcales	Ortega-Calvo & Stal 1994 [Stanier et al. 1971, Fig. 7, ellipsoid 6×10 μm]	
22. Gloeothece sp. PCC 6909	Pr	μmol O_2 (mg protein)$^{-1}$ hr^{-1}	0.696	13	18.39	20	[180]	Chroococcales	Ortega-Calvo & Stal 1994 [Stanier et al. 1971, Fig. 7, ellipsoid 6×10 μm]	
23. Gloeothece sp. PCC 6909	Pr	μmol O_2 (mg protein)$^{-1}$ hr^{-1}	0.856	16	22.63	20	[180]	Chroococcales	Ortega-Calvo & Stal 1994 [Stanier et al. 1971, Fig. 7, ellipsoid 6×10 μm]	
24. Gloeothece sp. PCC 6909	Pr	μmol O_2 (mg protein)$^{-1}$ hr^{-1}	1.061	20	28.28	20	[180]	Chroococcales	Ortega-Calvo & Stal 1994 [Stanier et al. 1971, Fig. 7, ellipsoid 6×10 μm]	
25. Gloeothece sp. PCC 6909	Pr	μmol O_2 (mg protein)$^{-1}$ hr^{-1}	1.714	32	45.26	20	[180]	Chroococcales	Ortega-Calvo & Stal 1994 [Stanier et al. 1971, Fig. 7, ellipsoid 6×10 μm]	
26. Gloeothece sp. PCC 6909	Pr	μmol O_2 (mg protein)$^{-1}$ hr^{-1}	1.927	36	50.91	20	[180]	Chroococcales	Ortega-Calvo & Stal 1994 [Stanier et al. 1971, Fig. 7, ellipsoid 6×10 μm]	
27. Gloeothece sp. PCC 6909	Pr	μmol O_2 (mg protein)$^{-1}$ hr^{-1}	2.149	40	56.57	20	[180]	Chroococcales	Ortega-Calvo & Stal 1994 [Stanier et al. 1971, Fig. 7, ellipsoid 6×10 μm]	
28. Nostoc commune	D	μmol O_2 (g WM)$^{-1}$ hr^{-1} at DM/WM = 0.067	2	0.6	0.52	27	[8]	Nostocales	Scherer et al. 1984 [Pereira et al. 2005, Fig. 8, cell width 2.5 μm]	Chl a/WM=0.0060-0.0098%; DM/WM=0.067; 6 hrs incubation
29. Nostoc commune var. flagelliforme	D	μmol O_2 (g WM)$^{-1}$ hr^{-1} at DM/WM = 0.172	5.5	1.4	1.22	27	[8]	Nostocales	Scherer et al. 1984 [Pereira et al. 2005, Fig. 8, cell width 2.5 μm]	DM/WM=0.172; 6 hrs incubation
30. Nostoc muscorum G.	D	μl O_2 (mg DM)$^{-1}$ hr^{-1}	1.1	1.8	1.80	25	[33]	Nostocales	Kratz & Myers 1955 [estimated from images at UTEX Culture Collection (http://www.zo.utexas.edu/research/utex/), diam 4 μm, filamentous]	Cells stored in darkness for 24 hr before measurements
31. Nostoc muscorum G.	D	μl O_2 (mg DM)$^{-1}$ hr^{-1}	4.4	7.3	7.30	25	[33]	Nostocales	Kratz & Myers 1955 [estimated from images at UTEX Culture Collection (http://www.zo.utexas.edu/research/utex/), diam 4 μm, filamentous]	growing cells harvested and prepared for dark respiration measurements in less than 35 min
32. Nostoc sp. strain Mac	D	μl O_2 (mg DM)$^{-1}$ hr^{-1}	23	26	9.85	39		Nostocales	Ingram et al. 1973	
33. Nostoc sp. strain Mac	D	μmol O_2 (mg DM)$^{-1}$ hr^{-1}	0.90	34	12.88	39		Nostocales	Bottomley & van Baalen 1978	

34. Nostoc sphaeroides	D	μmol O_2 (mg Chl a)$^{-1}$ hr^{-1}	21.3	4.5	4.50	25		Nostocales	Li & Gao 2004	Chl a/DM=0.0056 DM/WM=0.037; colony diam 0.08 cm
35. Nostoc sphaeroides	D	μmol O_2 (mg Chl a)$^{-1}$ hr^{-1}	20.3	5.2	5.20	25		Nostocales	Li & Gao 2004	Chl a/DM=0.0068 DM/WM=0.013; colony diam 0.30 cm
36. Nostoc sphaeroides	D	μmol O_2 (mg Chl a)$^{-1}$ hr^{-1}	23.8	7.2	7.20	25		Nostocales	Li & Gao 2004	Chl a/DM=0.0081 DM/WM=0.015; colony diam 0.67 cm
37. Nostoc sphaeroides	D	μmol O_2 (mg Chl a)$^{-1}$ hr^{-1}	35.7	9.5	9.50	25		Nostocales	Li & Gao 2004	Chl a/DM=0.0071 DM/WM=0.014; colony diam 0.20 cm
38. Oscillatoria (Limnothrix) redekei van Goor	C	pg C (pg cell C)$^{-1}$ day^{-1}	0.13	8	16.00	15		Oscillatoriales	Geider & Osborne 1989 (data of Foy & Gibson 1982)	
39. Oscillatoria (Limnothrix) redekei van Goor	C	pg C (pg cell C)$^{-1}$ day^{-1}	0.18	12	24.00	15		Oscillatoriales	Geider & Osborne 1989 (data of Foy & Gibson 1982)	
40. Oscillatoria terebriformis	D	μl O_2 (mg DM)$^{-1}$ hr^{-1}	17	29	7.25	45	65	Oscillatoriales	Richardson & Castenholz 1987 [cell diam 5 μm, Fig. 2A, filamentous]	In nature this thermophilic bacterium moves to anaerobic environments during the night, where it can live without external fructose for 3-4 days; survives aerobically in darkness no more than 1-2 days
41. Phormidium autumnale (Ag.) Gom.	D	mg C (g ash-free DM)$^{-1}$ hr^{-1}	0.04	0.12	0.59	2	[30]	Oscillatoriales	Davey 1989 [Broady 1991, trichome width 3-5 μm]	Ash/DM=0.60; AFDM/WM=0.04-0.067
42. Phormidium autumnale (Ag.) Gom.	D	mg C (g ash-free DM)$^{-1}$ hr^{-1}	0.07	0.21	0.84	5	[30]	Oscillatoriales	Davey 1989 [Broady 1991, trichome width 3-5 μm]	Ash/DM=0.60; AFDM/WM=0.04-0.067
43. Phormidium autumnale (Ag.) Gom.	D	mg C (g ash-free DM)$^{-1}$ hr^{-1}	0.1	0.3	0.85	10	[30]	Oscillatoriales	Davey 1989 [Broady 1991, trichome width 3-5 μm]	Ash/DM=0.60; AFDM/WM=0.04-0.067
44. Phormidium autumnale (Ag.) Gom.	D	mg C (g ash-free DM)$^{-1}$ hr^{-1}	0.17	0.5	1.00	15	[30]	Oscillatoriales	Davey 1989 [Broady 1991, trichome width 3-5 μm]	Ash/DM=0.60; AFDM/WM=0.04-0.067
45. Phormidium autumnale (Ag.) Gom.	D	mg C (g ash-free DM)$^{-1}$ hr^{-1}	0.3	0.9	1.27	20	[30]	Oscillatoriales	Davey 1989 [Broady 1991, trichome width 3-5 μm]	Ash/DM=0.60; AFDM/WM=0.04-0.067
46. Phormidium luridum	D	μl O_2 (mg DM)$^{-1}$ hr^{-1}	4.3-5.9	8.5	8.50	25	[4.4]	Oscillatoriales	Biggins 1969 [Pasteur Culture Collection, www.pasteur.fr, PCC 7602, width/diameter 1.8-2.3 μm, filamentous]	stable respiration during 8 hr in darkness
47. Planktothrix agardhii	D	mg O_2 (mg Chl a)$^{-1}$ hr^{-1} at Chl a/ODM = 0.0075	0.613	5.4	7.64	20	[19]	Oscillatoriales	Fietz & Nicklisch 2002 [Tonk et al. 2005, diam of filaments 3.3 μm]	ODM/V=0.42 C/N=4.0 C/ODM=0.42 **Chl a/ODM=0.0075**-0.0088; dark respiration measured for 20 min

48. Plectonema boryanum	Pr	nmol O_2 (mg protein)$^{-1}$ min^{-1}	5	5.6	5.23	26	[4.4]	Oscillatoriales	Padan et al. 1971 [Pasteur Culture Collection, www.pasteur.fr, PCC 6306, width/diameter 1.8-2.3 μm, filamentous]	respiration of log-harvested cells after incubation for several hr in darkness; stable for several days
49. Plectonema boryanum	Pr	nmol O_2 (mg protein)$^{-1}$ min^{-1}	15-20	20	18.66	26	[4.4]	Oscillatoriales	Padan et al. 1971 [Pasteur Culture Collection, www.pasteur.fr, PCC 6306, width/diameter 1.8-2.3 μm, filamentous]	respiration of log-harvested cells immediately after harvest
50. Plectonema boryanum	Pr	nmol O_2 (mg protein)$^{-1}$ min^{-1}	55	62	57.85	26	[4.4]	Oscillatoriales	Padan et al. 1971 [Pasteur Culture Collection, www.pasteur.fr, PCC 6306, width/diameter 1.8-2.3 μm, filamentous]	maximum respiration of log-harvested after light incubation in optimal conditions for8-10 hr
51. Prochloron sp. (isolated from Lissoclinum patella)	Chl	μmol O_2 (mg Chl)$^{-1}$ min^{-1}	0.9	30	24.37	28	[5600]	Chroococcales	Alberte et al. 1986 [Cox 1986, Fig. 26, diam 22 μm]	Chl/cell=5.5 pg; low-light culture
52. Prochloron sp. (isolated from Lissoclinum patella)	Chl	μmol O_2 (mg Chl)$^{-1}$ min^{-1}	3.8	127	103.16	28	[5600]	Chroococcales	Alberte et al. 1986 [Cox 1986, Fig. 26, diam 22 μm]	Chl/cell=2.7 pg; low-light culture
53. Schizothrix calcicola	Chl	mg O_2 (mg Chl a)$^{-1}$ hr^{-1}	0.58	10	10.00	25		Oscillatoriales	Tang & Vincent 2000	Mat-forming Arctic species; daylength 8 hr
54. Schizothrix calcicola	Chl	mg O_2 (mg Chl a)$^{-1}$ hr^{-1}	0.49	8.5	17.00	15		Oscillatoriales	Tang & Vincent 2000	Mat-forming Arctic species; daylength 8 hr
55. Schizothrix calcicola	Chl	mg O_2 (mg Chl a)$^{-1}$ hr^{-1}	1.38	24	24.00	25		Oscillatoriales	Tang & Vincent 2000	Mat-forming Arctic species; daylength 24 hr
56. Schizothrix calcicola	Chl	mg O_2 (mg Chl a)$^{-1}$ hr^{-1}	0.99	17	34.00	15		Oscillatoriales	Tang & Vincent 2000	Mat-forming Arctic species; daylength 24 hr
57. Spirulina platensis Compère 1968-3786	D	μmol O_2 (mg Chl a)$^{-1}$ hr^{-1}	46	9	9.00	25	[180]	Chroococcales	Gordillo et al. 1999 [Ciferri 1983, cell diameter 6-8μm, filamentous]	C/DM=0.697 N/DM=0.045 Chl a/DM=0.0053 soluble proteins/DM=0.083 nitrogen-limited, normal CO_2
58. Spirulina platensis Compère 1968-3786	D	μmol O_2 (mg Chl a)$^{-1}$ hr^{-1}	116	15	15.00	25	[180]	Chroococcales	Gordillo et al. 1999 [Ciferri 1983, cell diameter 6-8μm, filamentous]	C/DM=0.583 N/DM=0.042 Chl a/DM=0.0035 soluble proteins/DM=0.070; nitrogen-unlimited, high CO_2
59. Spirulina platensis Compère 1968-3786	D	μmol O_2 (mg Chl a)$^{-1}$ hr^{-1}	33	19	19.00	25	[180]	Chroococcales	Gordillo et al. 1999 [Ciferri 1983, cell diameter 6-8μm, filamentous]	C/DM=0.513 N/DM=0.108 Chl a/DM=0.0153 soluble proteins/DM=0.197; nitrogen-unlimited, high CO_2
60. Spirulina platensis Compère 1968-3786	D	μmol O_2 (mg Chl a)$^{-1}$ hr^{-1}	31	25	25.00	25	[180]	Chroococcales	Gordillo et al. 1999 [Ciferri 1983, cell diameter 6-8μm, filamentous]	C/DM=0.574 N/DM=0.131 Chl a/DM=0.0215 soluble proteins/DM=0.285; nitrogen-unlimited, normal CO_2
61. Spirulina platensis P 511	Chl	μmol O_2 (mg Chl a)$^{-1}$ hr^{-1}	33	18	12.73	30	[180]	Chroococcales	Berry et al. 2003 [Ciferri 1983, cell diameter 6-8μm, filamentous]	100 mM NaCl + 50 μM DBIMB

62. Spirulina platensis P 511	Chl	μmol O_2 (mg Chl a)$^{-1}$ hr^{-1}	45	25	17.68	30	[180]	Chroococcales	Berry et al. 2003 [Ciferri 1983, cell diameter 6-8μm, filamentous]	100 mM KCl
63. Spirulina platensis P 511	Chl	μmol O_2 (mg Chl a)$^{-1}$ hr^{-1}	62	35	24.75	30	[180]	Chroococcales	Berry et al. 2003 [Ciferri 1983, cell diameter 6-8μm, filamentous]	100 mM NaCl + 10 mMNaHCO_3
64. Spirulina platensis P 511	Chl	μmol O_2 (mg Chl a)$^{-1}$ hr^{-1}	64	36	25.46	30	[180]	Chroococcales	Berry et al. 2003 [Ciferri 1983, cell diameter 6-8μm, filamentous]	100 mM NaCl
65. Synechococcus sp. RF-1 (PCC 8801)	Chl	nmol O_2 (10^8 cells)$^{-1}$ min^{-1} at 15 μg Chl a cell^{-1}	3	2	1.74	27	[14]	Chroococcales	Chen et al. 1989 [Pasteur Culture Collection, www.pasteur.fr, PCC 8801, width/diameter 3 μm]	Chl a/cell=0.15 pg
66. Synechocystis aquatilis	Chl	μmol O_2 (mg Chl a)$^{-1}$ hr^{-1}	61.8	34	24.04	30	8	Chroococcales	de Magalhães et al. 2004 [Fig. 6C, cells nearly spherical ~2.5 μm in diam]	0.11-0.23 μg Chl a per 10^6 cells; control cells (not zinc-treated); isolated in Brasil
67. Synechocystis PCC 6803	Chl	mmol O_2 (g Chl a)$^{-1}$ (30 s)$^{-1}$	0.036	2.4	2.40	25	[8]	Chroococcales	Avendaño-Coletta & Schubert 2005 [Stanier et al. 1971, Fig. 5, sphere diam 2.5 μm]	Dark respiration during the first 30 s of 5min:5min light:dark regime at 200 μmol photons m^{-2} s^{-1}; dark respiration rates at 5:5 and 10:10 regimes and other photon densities (25, 35 and 100) are up to 7 W kg^{-1} [total 12 data entries]
68. Synechocystis PCC 6803	Chl	μmol O_2 (mg Chl)$^{-1}$ hr^{-1}	43	24	20.89	27	[8]	Chroococcales	Hammouda & El-Sheekh 1994 [Stanier et al. 1971, Fig. 5, sphere diam 2.5 μm]	
69. Trichodesmium spp.	D	mg O_2 (mg Chl a)$^{-1}$ hr^{-1}	2.41	7	5.27	29.1	[785]	Oscillatoriales	Carpenter & Roenneberg 1995 [Carpenter et al. 2004, Table 10]	Chl a/colony=50 ng C/colony=10 μg This means C/Chl a=200 and DM/Chl a=400, see also Trichodesmium Note; September natural day/night light regime
70. Trichodesmium spp.	D	mg O_2 (mg Chl a)$^{-1}$ hr^{-1}	4.93	14	10.76	28.8	[785]	Oscillatoriales	Carpenter & Roenneberg 1995 [Carpenter et al. 2004, Table 10]	Chl a/colony=50 ng C/colony=10 μg This means C/Chl a=200 and DM/Chl a=400, see also Trichodesmium Note
71. Trichodesmium spp.	D	mg O_2 (mg Chl a)$^{-1}$ hr^{-1}	17.6	51	49.26	25.5	[785]	Oscillatoriales	Carpenter & Roenneberg 1995 [Carpenter et al. 2004, Table 10]	Chl a/colony=50 ng C/colony=10 μg This means C/Chl a=200 and DM/Chl a=400, see also Trichodesmium Note
72. Trichodesmium spp.	Chl	mg O_2 (mg Chl a)$^{-1}$ hr^{-1}	12.5	218	189.78	27	[785]	Oscillatoriales	Roenneberg & Carpenter 1993 [Carpenter et al. 2004, Table 10]	calculated assumed DM/Chl a=67, but see Trichodesmium Note

73.	Trichodesmium spp.	Chl	mg O_2 (mg Chl a)$^{-1}$ hr^{-1}	13.4	233	202.84	27	[785]	Oscillatoriales	Roenneberg & Carpenter 1993 [Carpenter et al. 2004, Table 10]	calculated assumed DM/Chl a=67, but see Trichodesmium Note
74.	Trichodesmium spp.	Chl	mg O_2 (mg Chl a)$^{-1}$ hr^{-1}	18.0	313	272.48	27	[785]	Oscillatoriales	Roenneberg & Carpenter 1993 [Carpenter et al. 2004, Table 10]	calculated assumed DM/Chl a=67, but see Trichodesmium Note
75.	Trichodesmium spp.	Chl	mg O_2 (mg Chl a)$^{-1}$ hr^{-1}	26.9	468	407.42	27	[785]	Oscillatoriales	Roenneberg & Carpenter 1993 [Carpenter et al. 2004, Table 10]	calculated assumed DM/Chl a=67, but see Trichodesmium Note

Note on Chl a content in *Trichodesmium*

LaRoche and Breitbarth (2005) in their Table 1 give Chl a/C=96.5-320 μmol/mol. This corresponds to the C/Chl a mass ratio from 42 to 139 (assuming Chl a molar mass of 893.5 g/mol). LaRoche and Breitbarth (2005) refer to http://www.nioz.nl/projects/ironages for text and references. In Appendix 7, based on data of Berman-Frank et al. (2001), values of 0.018, 0.17, 0.19, 0.25 and 0.29 μg/μmol are listed for the Chl a/C ratio in *Trichodesmium*. This corresponds to C/Chl a mass ratio from 667 to 41.4.

However, in Appendix 2b of LaRoche and Breitbarth (2005), according to the data of Mague et al. (1977), carbon content per colony is 9.7×10^3 ng, while Chl a content is 34 μg/colony. This gives a mass ratios C/Chl a=285. This is consistent with data obtained by Carpenter (1983) as cited by Carpenter and Roenneberg (1995): 10 μg C/colony at 50 ng Chl a/colony (C/Chl a=200). In Table 2 of LaRoche and Breitbarth (2005) it is said that C/colony=0.81-0.92 μmol=9.7-11 μg, while Chl a/colony = 89.5 fmol/colony = 79 pg Chl a/colony, too low a figure to be realistic.

Carpenter et al. (2004) in their Table 5 list seven measurements for C and Chl a content per colony in April (C/Chl a mass ratio ranges from 54 to 131 with a mean of 100), and five measurements for C and Chl a content per colony in October (C/Chl a mass ratio ranges from 160 to 343 with a mean of 240). These data, too, indicate that *Trichodesmium* possesses a lower percentage of chlorophyll than algae on average (Chl a/DM ratio of 0.015) (APHA 1992). (E.g. Stal & Moezelaar (1999) for cyanobacteria employed Pr/DM = 0.55 and Pr/Chl a = 27, which gives Chl a/DM = 0.02).

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