Dataset S9. Dark respiration rates in eukaryotic macroalgae

Notes to Table **S9**:

Data on dark respiration rates in eukaryotic macroalgae (including uniseriate filaments) are presented. Taxonomic status (the **"Phylum: Class"** 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.

"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}.

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

qWkg is dark respiration rate converted to W (kg WM)$^{-1}$ (Watts per kg wet mass) using the following conversion factors. If the DM/WM (dry mass to wet mass) ratio is unknown, while **qou** is reported per unit dry mass, the ratio DM/WM = 0.3 was used, as a crude mean for all taxa applied in the analysis (SI Methods, Table S12a). If the DM/WM ratio is known, while **qou** is reported per unit wet mass, the dark respiration rate is first calculated per unit dry mass and then converted to **qWkg** using the reference DM/WM = 0.3. This procedure was applied to make DM- and WM-based data comparable whenever possible. The respiratory quotent of unity was used (1 mol CO_2 released per 1 mol O_2 consumed). Energy conversion: 1 ml O_2 = 20 J. In four cases ***qou*** was reported per unit chlorophyll *a* mass. In these cases mass ratio Chl a/DM = 0.003 was adopted to express dark respiration rate per unit dry mass, which was then converted to **qWkg** at DM/WM = 0.3. The ratio Chl a/DM = 0.003 was used as the mean for the studied species with known Chl a/DM ratio (range 0.00016-0.012, N = 42, Table **S9**). If **qou** was reported per unit wet mass with no information on the DM/WM ratio available, **qWkg** was obtained from **qou** without mass unit conversions applied.

TC is ambient temperature during measurements, degrees Celsius.

q25Wkg, temperature conversions: Regression of $\log_{10}$ qWkg on TC for DM-based measurements (N = 77) yielded the following results, $\log_{10}$ qWkg = *a* + *b* TC, where *a* = 0.20 ± 0.06 (±1 s.e.), *b* = 0.015 ± 0.004 (± 1 s.e.), N = 77, p = 0.0007, R^2 = 0.14. This corresponds to $Q_{10} = 10^{10b}$ = 1.4

(Makarieva et al. 2006), with 95% C.I. for Q_{10} from 1.2 to 1.7. This Q_{10} was used to convert qWkg to 25 ° C, column **"q25Wkg"**, as follows: **q25Wkg** = **qWkg** $\times$ $1.4^{(25 - TC)/10}$, dimension W (kg WM)$^{-1}$. For each species rows are arranged in the order of increasing **q25Wkg**.

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 88 values for n = 88 species). The corresponding rows are highlighted in blue.

References within Table **S9** to Tables, Figures etc. refer to the corresponding items in the original literature indicated in the **Source** column.

Table **S9**. Dark respiration rates in eukaryotic macroalgae.

Species	U	Original units	qou	qWkg	TC	q25Wkg	Phylum: Class	Source	Comments
1. Acrosiphonia penicilliformis	W	μmol O_2 (g WM)$^{-1}$ hr^{-1}	1.56	0.19	1.5	0.42	Chlorophyta: Ulvophyceae	Aguilera et al. 1999	Arctic; dark respiration measured for 3-4 hrs after 2 hr exposure to artificial photosynthetic active radiation (PAR) or PAR and ultraviolet radiation
2. Adenocystis utricularis	D	μmol CO_2 (g WM)$^{-1}$ hr^{-1} at DM/WM = 0.212	2.80	0.50	0	1.16	Ochrophyta: Phaeophyceae	Weykam et al. 1996	Antarctic species; Chl a/DM = 0.0030
3. Antarctosaccion applanatum	D	μmol CO_2 (g WM)$^{-1}$ hr^{-1} at DM/WM = 0.196	62.10	11.8	0	27.37	Ochrophyta: Phaeothamniophyceae	Weykam et al. 1996	Antarctic species; Chl a/DM = 0.0064
4. Ascophyllum nodosum	W	μmol O_2 (g WM)$^{-1}$ hr^{-1}	2.9	0.36	10	0.60	Ochrophyta: Phaeophyceae	Skene 2004	Scotland; mean temperature of coastal North Sea; measurements were taken over a 10-min period, which was long enough to observe a constant rate of change of O_2 concentration
5. Ascoseira mirabilis	D	μmol CO_2 (g WM)$^{-1}$ hr^{-1} at DM/WM = 0.132	11.75	3.3	0	7.65	Ochrophyta: Phaeophyceae	Weykam et al. 1996	Antarctic species; Chl a/DM = 0.0065
6. Audouinella hermannii	D	mg O_2 (g DM)$^{-1}$ hr^{-1}	4	4.5	15	6.30	Rhodophyta: Florideophyceae	Necchi & Zucchi 2001	Brazil, freshwater; dark respiration measured for 45 minutes; temperature closest to the naturally encountered is chosen; studied temperatures 10, 15, 20, 25 °C; culture specimens
7. Audouinella pygmaea	D	mg O_2 (g DM)$^{-1}$ hr^{-1}	7.5	8.7	20	10.29	Rhodophyta: Florideophyceae	Necchi & Zucchi 2001	Brazil, freshwater; dark respiration measured for 45 minutes; temperature closest to the naturally encountered is chosen; studied temperatures 10, 15, 20, 25 °C; culture specimens; at 25 °C respiration is less than at 20 ° C.
8. Ballia callitricha	D	μmol O_2 (g WM)$^{-1}$ hr^{-1} at DM/WM = 0.212	2	0.35	0	0.81	Rhodophyta: Florideophyceae	Eggert & Wiencke 2000	Antarctic species; Chl a/DM = 0.0006-0.0011 depending on growth temperature
9. Ballia callitricha	D	μmol CO_2 (g WM)$^{-1}$ hr^{-1} at DM/WM = 0.547	33	7.5	0	17.39	Rhodophyta: Florideophyceae	Weykam et al. 1996	Antarctic species; Chl a/DM = 0.0012
10. Bangia atropurpurea	D	mg O_2 (mg DM)$^{-1}$ hr^{-1}	1.34	1.5	15	2.10	Rhodophyta: Bangiophyceae	Graham & Graham 1987	Lake Ontario
11. Batrachospermum ambiguum	D	mg O_2 (g DM)$^{-1}$ hr^{-1}	6	7.1	20	8.40	Rhodophyta: Florideophyceae	Necchi & Zucchi 2001	Brazil, freshwater; dark respiration measured for 45 minutes; temperature closest to the naturally encountered is chosen; studied temperatures 10, 15, 20, 25 °C

12.	Batrachospermum delicatulum	D	mg O_2 (g DM)$^{-1}$ hr^{-1}	1.1	1.4	20	1.66	Rhodophyta: Florideophyceae	Necchi & Alves 2005	Brazil; The lowest value from Table 2; 'Chantransia' stage; samples of field populations were collected or measured (noon ±2 h) at the end of the typical growth period in this region (September to October); respiration ranged from 1.1. to 10.3; in cultured algae from 0.6 to 13.6 original units
13.	Batrachospermum delicatulum	D	mg O_2 (g DM)$^{-1}$ hr^{-1}	4.5	5.3	25	5.30	Rhodophyta: Florideophyceae	Necchi 2004	Brazil; also studied temperatures 10, 15, 20 ° C
14.	Batrachospermum macrosporum	D	mg O_2 (g DM)$^{-1}$ hr^{-1}	1.2	1.5	20	1.77	Rhodophyta: Florideophyceae	Necchi & Zucchi 2001	Brazil, freshwater; dark respiration measured for 45 minutes; temperature closest to the naturally encountered is chosen; studied temperatures 10, 15, 20, 25 °C; culture specimens "Chantransia" stage
15.	Batrachospermum vogesiacum	D	mg O_2 (g DM)$^{-1}$ hr^{-1}	4.4	5.1	25	5.10	Rhodophyta: Florideophyceae	Necchi & Zucchi 2001	Brazil, freshwater; dark respiration measured for 45 minutes; temperature closest to the naturally encountered is chosen; studied temperatures 10, 15, 20, 25 °C
16.	Bostrychia moritziana	W	μmol O_2 (mg Chl a) hr^{-1} at Chl a/WM = 0.001	18	2.2	25	2.20	Rhodophyta: Florideophyceae	Karsten et al. 1993	Isolates from Venezuela; Australian samples respired at 62.6/7.6 orig. units (rate of photosynthesis divided by the ratio of photosynthesis to respiration)
17.	Callophyllis sp.	D	μmol CO_2 (g WM)$^{-1}$ hr^{-1} at DM/WM = 0.272	6.71	0.93	0	2.16	Rhodophyta: Florideophyceae	Weykam et al. 1996	Antarctic species; Chl a/DM = 0.0023
18.	Callophyllis variegata	D	μmol CO_2 (g WM)$^{-1}$ hr^{-1} at DM/WM = 0.150	6.15	1.54	0	3.57	Rhodophyta: Florideophyceae	Weykam et al. 1996	Antarctic species; Chl a/DM = 0.0015
19.	Caulerpa taxifolia	D	μmol O_2 (g DM)$^{-1}$ min^{-1}	0.27	0.6	22	0.66	Chlorophyta: Bryopsidophyceae	Chisholm et al. 2000	Subtropical Australia; 22 °C is within the natural temperature range of this species; respiration increases with decreasing temperature (negative Q10); Chl a/ DM = 0.0007-0.0031
20.	Chaetomorpha sp.	Chl	μmol C (mg Chl a)$^{-1}$ hr^{-1}	3.0	0.3	24	0.31	Chlorophyta: Ulvophyceae	Burris 1977	The original value is the ratio of (net photosynthetic rate) in the air (Table 1) to the (steady-state dark respiration rate); temperature is close to the ambient temperature in the northern Gulf of California at the time of collection
21.	Chara braunii	D	mg O_2 (g DM)$^{-1}$ hr^{-1}	3	3.5	25	3.50	Charophyta: Charophyceae	Vieira & Necchi 2003	Brazil; also studied temperatures 10, 15, 20 ° C
22.	Chara guarinensis	D	mg O_2 (g DM)$^{-1}$ hr^{-1}	3.5	4.1	25	4.10	Charophyta: Charophyceae	Vieira & Necchi 2003	Brazil; also studied temperatures 10, 15, 20 ° C
23.	Chara hispida	D	mg O_2 (g ash-free DM)$^{-1}$ hr^{-1}	2	2.4	30	2.03	Charophyta: Charophyceae	Menendez & Sanchez 1998	Spain; dark respiration in May, period of maximum photosyntheis; also studied temperatures 10, 20 °C; Q_{10} between 20 and 30 °C is less than unity; Chl a/WM = 0.00005-0.0004 depending on the season
24.	Cladophora glomerata	D	mg O_2 (g DM)$^{-1}$ hr^{-1}	3.8	4.4	25	4.40	Chlorophyta: Ulvophyceae	Necchi 2004	Brazil; also studied temperatures 10, 15, 20, 30 ° C
25.	Cladophora glomerata	D	mg O_2 (g DM)$^{-1}$ hr^{-1}	4	4.7	25	4.70	Chlorophyta: Ulvophyceae	Necchi 2004	Brazil; also studied temperatures 10, 15, 20, 30 ° C
26.	Compsopogon coeruleus	D	mg O_2 (g DM)$^{-1}$ hr^{-1}	3.4	3.9	20	4.61	Rhodophyta: Compsopogonophyceae	Necchi & Zucchi 2001	Brazil, freshwater; dark respiration measured for 45 minutes; temperature closest to the naturally encountered is chosen; studied temperatures 10, 15, 20, 25 °C
27.	Compsopogon coeruleus	D	mg O_2 (g DM)$^{-1}$ hr^{-1}	7.2	12	25	12.00	Rhodophyta: Compsopogonophyceae	Necchi 2004	Brazil; also studied temperatures 10, 15, 20, 30 ° C

28.	Curdiea racovitzae	D	μmol CO_2 (g WM)$^{-1}$ hr^{-1} at DM/WM = 0.337	5.59	0.62	0	1.44	Rhodophyta: Florideophyceae	Weykam et al. 1996	Antarctic species; Chl a/DM = 0.0011
29.	Cystosphaera jacquinotii	D	μmol CO_2 (g WM)$^{-1}$ hr^{-1} at DM/WM = 0.151	10.07	2.5	0	5.80	Ochrophyta: Phaeophyceae	Weykam et al. 1996	Antarctic species; Chl a/DM = 0.0028
30.	Delesseria lancifolia	D	μmol CO_2 (g WM)$^{-1}$ hr^{-1} at DM/WM = 0.209	31.33	5.60	0	12.99	Rhodophyta: Florideophyceae	Weykam et al. 1996	Antarctic species; Chl a/DM = 0.0023
31.	Desmarestia aculeata	W	μmol O_2 (g WM)$^{-1}$ hr^{-1}	2.75	0.34	1.5	0.75	Ochrophyta: Phaeophyceae	Aguilera et al. 1999	Arctic; dark respiration measured for 3-4 hrs after 2 hr exposure to artificial photosynthetic active radiation (PAR) or PAR and ultraviolet radiation
32.	Desmarestia anceps	D	μmol CO_2 (g WM)$^{-1}$ hr^{-1} at DM/WM = 0.187	21.26	4.25	0	9.86	Ochrophyta: Phaeophyceae	Weykam et al. 1996	Antarctic species; Chl a/DM = 0.0037
33.	Desmarestia antarctica (adult)	D	μmol CO_2 (g WM)$^{-1}$ hr^{-1} at DM/WM = 0.287	8.39	1.09	0	2.53	Ochrophyta: Phaeophyceae	Weykam et al. 1996	Antarctic species; Chl a/DM = 0.0032; juveniles respire at 22.38 μmol CO_2 (g FM)$^{-1}$ hr^{-1} at DM/WM = 0.166 (qWkg = 5 W kg^{-1}) and have Chl a/DM = 0.0038
34.	Desmarestia menziesii	D	μmol CO_2 (g WM)$^{-1}$ hr^{-1} at DM/WM = 0.141	12.31	3.26	0	7.56	Ochrophyta: Phaeophyceae	Weykam et al. 1996	Antarctic species; Chl a/DM = 0.0075
35.	Devaleraea ramentacea	W	μmol O_2 (g WM)$^{-1}$ hr^{-1}	0.90	0.11	1.5	0.24	Rhodophyta: Florideophyceae	Aguilera et al. 1999	Arctic; dark respiration measured for 3-4 hrs after 2 hr exposure to artificial photosynthetic active radiation (PAR) or PAR and ultraviolet radiation
36.	Enteromorpha bulbosa	D	μmol CO_2 (g WM)$^{-1}$ hr^{-1} at DM/WM = 0.193	11.19	2.2	0	5.10	Chlorophyta: Ulvophyceae	Weykam et al. 1996	Antarctic species; Chl a/DM = 0.0077
37.	Enteromorpha sp.	Chl	μmol C (mg Chl a)$^{-1}$ hr^{-1}	7.7	0.9	20	1.06	Chlorophyta: Ulvophyceae	Burris 1977	The original value is the ratio of (net photosynthetic rate) in the air (Table 1) to the (steady-state dark respiration rate); species collected in California
38.	Fucus distichus	W	μmol O_2 (g WM)$^{-1}$ hr^{-1}	0.88	0.11	1.5	0.24	Ochrophyta: Phaeophyceae	Aguilera et al. 1999	Arctic; dark respiration measured for 3-4 hrs after 2 hr exposure to artificial photosynthetic active radiation (PAR) or PAR and ultraviolet radiation
39.	Fucus serratus	W	μmol O_2 (g WM)$^{-1}$ hr^{-1}	1.5	0.19	10	0.31	Ochrophyta: Phaeophyceae	Skene 2004	Scotland; mean temperature of coastal North Sea; measurements were taken over a 10-min period, which was long enough to observe a constant rate of change of O_2 concentration
40.	Fucus spiralis	W	μmol O_2 (g WM)$^{-1}$ hr^{-1}	4.2	0.52	10	0.86	Ochrophyta: Phaeophyceae	Skene 2004	Scotland; mean temperature of coastal North Sea; measurements were taken over a 10-min period, which was long enough to observe a constant rate of change of O_2 concentration
41.	Fucus vesiculosus	W	μmol O_2 (g WM)$^{-1}$ hr^{-1}	2.5	0.31	10	0.51	Ochrophyta: Phaeophyceae	Skene 2004	Scotland; mean temperature of coastal North Sea; measurements were taken over a 10-min period, which was long enough to observe a constant rate of change of O_2 concentration
42.	Geminocarpus geminatus	D	μmol CO_2 (g WM)$^{-1}$ hr^{-1} at DM/WM = 0.229	25.73	4.19	0	9.72	Ochrophyta: Phaeophyceae	Weykam et al. 1996	Antarctic species; Chl a/DM = 0.0095
43.	Georgiella confluens	D	μmol CO_2 (g WM)$^{-1}$ hr^{-1} at DM/WM = 0.201	15.66	2.91	0	6.75	Rhodophyta: Florideophyceae	Weykam et al. 1996	Antarctic species; Chl a/DM = 0.0040
44.	Gigartina skottsbergii	D	μmol O_2 (g WM)$^{-1}$ h^{-1} at DM/WM = 0.222	2.5	0.42	0	0.97	Rhodophyta: Florideophyceae	Eggert & Wiencke 2000	Antarctic species; Chl a/DM = 0.0009
45.	Gigartina skottsbergii	D	μmol CO_2 (g WM)$^{-1}$ hr^{-1} at DM/WM = 0.331	5	0.56	0	1.30	Rhodophyta: Florideophyceae	Weykam et al. 1996	Antarctic species; Chl a/DM = 0.0007
46.	Gymnogongrus antarcticus	D	μmol CO_2 (g WM)$^{-1}$ h^{-1} at DM/WM = 0.110	2.5	0.85	0	1.97	Rhodophyta: Florideophyceae	Eggert & Wiencke 2000	Antarctic species; Chl a/DM = 0.0022-0.0026 depending on growth temperature

47. Gymnogongrus antarcticus	D	µmol CO_2 (g WM)$^{-1}$ hr^{-1} at DM/WM = 0.228	11.2	1.8	0	4.17	Rhodophyta: Florideophyceae	Weykam et al. 1996	Antarctic species; Chl a/DM = 0.0021
48. Halopteris obovata	D	µmol CO_2 (g WM)$^{-1}$ hr^{-1} at DM/WM = 0.415	30.77	2.77	0	6.42	Ochrophyta: Phaeophyceae	Weykam et al. 1996	Antarctic species; Chl a/DM = 0.0028
49. Himantothallus grandifolius	D	µmol CO_2 (g WM)$^{-1}$ hr^{-1} at DM/WM = 0.127	3.92	1.16	0	2.69	Ochrophyta: Phaeophyceae	Weykam et al. 1996	Antarctic species; Chl a/DM = 0.0025
50. Hymenocladiopsis crustigena	D	µmol CO_2 (g WM)$^{-1}$ hr^{-1} at DM/WM = 0.122	10.07	3.07	0	7.12	Rhodophyta: Florideophyceae	Weykam et al. 1996	Antarctic species; Chl a/DM = 0.0028
51. Kallymenia antarctica	D	µmol O_2 (g WM)$^{-1}$ h^{-1} at DM/WM = 0.140	1.2	0.32	0	0.74	Rhodophyta: Florideophyceae	Eggert & Wiencke 2000	Antarctic species; Chl a/DM = 0.00059-0.00073 depending on growth temperature
52. Kallymenia antarctica	D	µmol CO_2 (g WM)$^{-1}$ hr^{-1} at DM/WM = 0.183	5	1	0	2.32	Rhodophyta: Florideophyceae	Weykam et al. 1996	Antarctic species; Chl a/DM = 0.0003
53. Laminaria digitata	W	µmol O_2 (g WM)$^{-1}$ hr^{-1}	0.66	0.082	1.5	0.18	Ochrophyta: Phaeophyceae	Aguilera et al. 1999	Arctic; dark respiration measured for 3-4 hrs after 2 hr exposure to artificial photosynthetic active radiation (PAR) or PAR and ultraviolet radiation
54. Laminaria saccharina	W	µmol O_2 (g WM)$^{-1}$ hr^{-1}	1.00	0.12	1.5	0.26	Ochrophyta: Phaeophyceae	Aguilera et al. 1999	Arctic; dark respiration measured for 3-4 hrs after 2 hr exposure to artificial photosynthetic active radiation (PAR) or PAR and ultraviolet radiation
55. Laminaria saccharina	D	µmol O_2 (cm^{-2} leaf area) hr^{-1} at 32.2 mg WM cm^{-2} and DM/WM = 0.131	0.12	1	13	1.50	Ochrophyta: Phaeophyceae	Gerard 1988	Three habitats in the vicinity of New York, roughly similar data for shallow, deep and turbid habitat; DM/WM = 0.11-0.179 (largest at high light regime); C/DM = 0.267-0.352; N/DM = 1.90-3.00%
56. Laminaria solidungula	W	µmol O_2 (g WM)$^{-1}$ hr^{-1}	0.78	0.097	1.5	0.21	Ochrophyta: Phaeophyceae	Aguilera et al. 1999	Arctic; dark respiration measured for 3-4 hrs after 2 hr exposure to artificial photosynthetic active radiation (PAR) or PAR and ultraviolet radiation
57. Iridaea cordata	D	µmol CO_2 (g WM)$^{-1}$ hr^{-1} at DM/WM = 0.287	5.59	0.73	0	1.69	Rhodophyta: Florideophyceae	Weykam et al. 1996	Antarctic species; Chl a/DM = 0.0012
58. Mastocarpus stellatus	W	µmol O_2 (g WM)$^{-1}$ hr^{-1}	7.8	0.97	10	1.61	Rhodophyta: Florideophyceae	Skene 2004	Scotland; mean temperature of coastal North Sea; measurements were taken over a 10-min period, which was long enough to observe a constant rate of change of O_2 concentration
59. Monostroma arcticum	W	µmol O_2 (g WM)$^{-1}$ hr^{-1}	5.13	0.64	1.5	1.41	Chlorophyta: Ulvophyceae	Aguilera et al. 1999	Arctic; dark respiration measured for 3-4 hrs after 2 hr exposure to artificial photosynthetic active radiation (PAR) or PAR and ultraviolet radiation
60. Monostroma hariotii	D	µmol CO_2 (g WM)$^{-1}$ hr^{-1} at DM/WM = 0.240	16.78	2.6	0	6.03	Chlorophyta: Ulvophyceae	Weykam et al. 1996	Antarctic species; Chl a/DM = 0.0057
61. Mougeotia	D	mg O_2 (mg DM)$^{-1}$ hr^{-1}	2.67	3.1	15	4.34	Charophyta: Zygnematophyceae	Graham et al. 1996	Wisconsin, USA
62. Myriogramme mangini	D	µmol CO_2 (g WM)$^{-1}$ hr^{-1} at DM/WM = 0.172	6.71	1.47	0	3.41	Rhodophyta: Florideophyceae	Weykam et al. 1996	Antarctic species; Chl a/DM = 0.0027
63. Myriogramme smithii	D	µmol CO_2 (g WM)$^{-1}$ hr^{-1} at DM/WM = 0.255	34.69	5.08	0	11.78	Rhodophyta: Florideophyceae	Weykam et al. 1996	Antarctic species; Chl a/DM = 0.0029
64. Nitella furcata var. sieberi	D	mg O_2 (g DM)$^{-1}$ hr^{-1}	1.2	2	25	2.00	Charophyta: Charophyceae	Necchi 2004	Brazil; also studied temperatures 10, 15, 20, 30 ° C
65. Nitella sp.	D	mg O_2 (g DM)$^{-1}$ hr^{-1}	7.2	8.4	25	8.40	Charophyta: Charophyceae	Vieira & Necchi 2003	Brazil; also studied temperatures 10, 15, 20 ° C
66. Nitella subglomerata	D	mg O_2 (g DM)$^{-1}$ hr^{-1}	6.7	7.8	25	7.80	Charophyta: Charophyceae	Vieira & Necchi 2003	Brazil; also studied temperatures 10, 15, 20 ° C

67. Odonthalia dentata	W	µmol O_2 (g WM)$^{-1}$ hr^{-1}	2.47	0.31	1.5	0.68	Rhodophyta: Florideophyceae	Aguilera et al. 1999	Arctic; dark respiration measured for 3-4 hrs after 2 hr exposure to artificial photosynthetic active radiation (PAR) or PAR and ultraviolet radiation
68. Palmaria decipiens	D	µmol CO_2 (g WM)$^{-1}$ hr^{-1} at DM/WM = 0.107	5.59	1.96	0	4.55	Rhodophyta: Florideophyceae	Weykam et al. 1996	Antarctic species; Chl a/DM = 0.0027
69. Palmaria palmata	W	µmol O_2 (g WM)$^{-1}$ hr^{-1}	1.16	0.14	1.5	0.31	Rhodophyta: Florideophyceae	Aguilera et al. 1999	Arctic; dark respiration measured for 3-4 hrs after 2 hr exposure to artificial photosynthetic active radiation (PAR) or PAR and ultraviolet radiation
70. Palmaria palmata	W	µmol O_2 (g WM)$^{-1}$ hr^{-1}	6.5	0.81	10	1.34	Rhodophyta: Florideophyceae	Skene 2004	Scotland; mean temperature of coastal North Sea; measurements were taken over a 10-min period, which was long enough to observe a constant rate of change of O_2 concentration
71. Pantoneura plocamioides	D	µmol CO_2 (g WM)$^{-1}$ hr^{-1} at DM/WM = 0.283	11.19	1.47	0	3.41	Rhodophyta: Florideophyceae	Weykam et al. 1996	Antarctic species; Chl a/DM = 0.0019
72. Pelvetia canaliculata	W	µmol O_2 (g WM)$^{-1}$ hr^{-1}	8.3	1	10	1.66	Ochrophyta: Phaeophyceae	Skene 2004	Scotland; mean temperature of coastal North Sea; measurements were taken over a 10-min period, which was long enough to observe a constant rate of change of O_2 concentration
73. Phaeurus antarcticus	D	µmol CO_2 (g WM)$^{-1}$ hr^{-1} at DM/WM = 0.193	10.07	1.94	0	4.50	Ochrophyta: Phaeophyceae	Weykam et al. 1996	Antarctic species; Chl a/DM = 0.0098
74. Phycodrys quercifolia	D	µmol CO_2 (g WM)$^{-1}$ hr^{-1} at DM/WM = 0.325	40.28	4.62	0	10.71	Rhodophyta: Florideophyceae	Weykam et al. 1996	Antarctic species; Chl a/DM = 0.0033
75. Phycodrys rubens	W	µmol O_2 (g WM)$^{-1}$ hr^{-1}	1.53	0.19	1.5	0.42	Rhodophyta: Florideophyceae	Aguilera et al. 1999	Arctic; dark respiration measured for 3-4 hrs after 2 hr exposure to artificial photosynthetic active radiation (PAR) or PAR and ultraviolet radiation
76. Phyllophora ahnfeltioides	D	µmol O_2 (g WM)$^{-1}$ h^{-1} at DM/WM = 0.310	0.8	0.32	0	0.74	Rhodophyta: Florideophyceae	Eggert & Wiencke 2000	Antarctic species; Chl a/DM = 0.00012-0.00017 depending on growth temperature
77. Phyllophora ahnfeltioides	D	µmol CO_2 (g WM)$^{-1}$ hr^{-1} at DM/WM = 0.272	28	3.8	0	8.81	Rhodophyta: Florideophyceae	Weykam et al. 1996	Antarctic species; Chl a/DM = 0.0006
78. Phyllophora antarctica	W	µmol O_2 (g WM)$^{-1}$ hr^{-1}	2.3	0.3	0	0.70	Rhodophyta: Florideophyceae	Schwarz et al. 2003	Antarctic species; minimum respiration at studied depths (10-25 m); Chl a/WM = 0.000048-0.000071
79. Phyllophora appendiculata	D	µmol CO_2 (g WM)$^{-1}$ hr^{-1} at DM/WM = 0.230	10.07	1.63	0	3.78	Rhodophyta: Florideophyceae	Weykam et al. 1996	Antarctic species; Chl a/DM = 0.0027
80. Phyllophora truncata	W	µmol O_2 (g WM)$^{-1}$ hr^{-1}	0.63	0.078	1.5	0.17	Rhodophyta: Florideophyceae	Aguilera et al. 1999	Arctic; dark respiration measured for 3-4 hrs after 2 hr exposure to artificial photosynthetic active radiation (PAR) or PAR and ultraviolet radiation
81. Picconiella plumosa	D	µmol CO_2 (g WM)$^{-1}$ hr^{-1} at DM/WM = 0.233	26.85	4.30	0	9.97	Rhodophyta: Florideophyceae	Weykam et al. 1996	Antarctic species; Chl a/DM = 0.0027
82. Pithophora oedogonia	D	mg O_2 (g DM)$^{-1}$ hr^{-1}	0.3	0.35	5	0.69	Chlorophyta: Ulvophyceae	Spencer et al. 1985	USA; uniseriate filament
83. Plocamium cartilagineum	D	µmol CO_2 (g WM)$^{-1}$ hr^{-1} at DM/WM = 0.203	26.85	4.94	0	11.46	Rhodophyta: Florideophyceae	Weykam et al. 1996	Antarctic species; Chl a/DM = 0.0028
84. Porphyra endiviifolium	D	µmol CO_2 (g WM)$^{-1}$ hr^{-1} at DM/WM = 0.322	24.62	2.85	0	6.61	Rhodophyta: Bangiophyceae	Weykam et al. 1996	Antarctic species; Chl a/DM = 0.0079
85. Porphyra umbilicalis	W	µmol O_2 (g WM)$^{-1}$ hr^{-1}	20	2.5	10	4.14	Rhodophyta: Bangiophyceae	Skene 2004	Scotland; mean temperature of coastal North Sea; measurements were taken over a 10-min period, which was long enough to observe a constant rate of change of O_2 concentration

86.	Prasiola crispa	D	mg C (g ash-free DM)$^{-1}$ hr^{-1}	0.05	0.15	2	0.33	Chlorophyta: Trebouxiophyceae	Davey 1989	Antarctic species, terrestrial; at 2, 5, 10, 15 and 20 °C respired at 0.05, 0.14, 0.16, 0.25 and 0.5 original units, respectively; monostromatic blades or uniseriate filaments; 9% ash in dry mass; AFDM/WM = 0.17-0.20.
87.	Prasiola crispa	D	mg C (g ash-free DM)$^{-1}$ hr^{-1}	0.14	0.42	5	0.82	Chlorophyta: Trebouxiophyceae	Davey 1989	Antarctic species, terrestrial; at 2, 5, 10, 15 and 20 °C respired at 0.05, 0.14, 0.16, 0.25 and 0.5 original units, respectively; monostromatic blades or uniseriate filaments; 9% ash in dry mass; AFDM/WM = 0.17-0.20.
88.	Prasiola crispa	D	mg C (g ash-free DM)$^{-1}$ hr^{-1}	0.16	0.48	10	0.80	Chlorophyta: Trebouxiophyceae	Davey 1989	Antarctic species, terrestrial; at 2, 5, 10, 15 and 20 °C respired at 0.05, 0.14, 0.16, 0.25 and 0.5 original units, respectively; monostromatic blades or uniseriate filaments; 9% ash in dry mass; AFDM/WM = 0.17-0.20.
89.	Prasiola crispa	D	mg C (g ash-free DM)$^{-1}$ hr^{-1}	0.27	0.81	15	1.13	Chlorophyta: Trebouxiophyceae	Davey 1989	Antarctic species, terrestrial; at 2, 5, 10, 15 and 20 °C respired at 0.05, 0.14, 0.16, 0.25 and 0.5 original units, respectively; monostromatic blades or uniseriate filaments; 9% ash in dry mass; AFDM/WM = 0.17-0.20.
90.	Prasiola crispa	D	mg C (g ash-free DM)$^{-1}$ hr^{-1}	0.5	1.5	20	1.77	Chlorophyta: Trebouxiophyceae	Davey 1989	Antarctic species, terrestrial; at 2, 5, 10, 15 and 20 °C respired at 0.05, 0.14, 0.16, 0.25 and 0.5 original units, respectively; monostromatic blades or uniseriate filaments; 9% ash in dry mass; AFDM/WM = 0.17-0.20.
91.	Ptilota plumosa	W	μmol O_2 (g WM)$^{-1}$ hr^{-1}	0.75	0.093	1.5	0.21	Rhodophyta: Florideophyceae	Aguilera et al. 1999	Arctic; dark respiration measured for 3-4 hrs after 2 hr exposure to artificial photosynthetic active radiation (PAR) or PAR and ultraviolet radiation
92.	Saccorhiza dermatodea	W	μmol O_2 (g WM)$^{-1}$ hr^{-1}	0.63	0.078	1.5	0.17	Ochrophyta: Phaeophyceae	Aguilera et al. 1999	Arctic; dark respiration measured for 3-4 hrs after 2 hr exposure to artificial photosynthetic active radiation (PAR) or PAR and ultraviolet radiation
93.	Sargassum natans	D	mg C (g DM)$^{-1}$ hr^{-1}	0.31	0.9	27	0.84	Ochrophyta: Phaeophyceae	Lapointe 1995	Mean value for oceanic populations (natural ambient temperature from 18 to 29 °C); neritic populations (temp from 24 to 30) respired at 0.51 orig. units
94.	Sargassum sp.	Chl	μmol C (mg Chl a)$^{-1}$ hr^{-1}	7.9	0.9	24	0.93	Ochrophyta: Phaeophyceae	Burris 1977	The original value is the ratio of (net photosynthetic rate) in the air (Table 1) to the (steady-state dark respiration rate); temperature is close to the ambient temperature in the northern Gulf of California at the time of collection
95.	Spirogyra sp.	D	mg O_2 (g DM)$^{-1}$ hr^{-1}	7.5	12.5	25	12.50	Charophyta: Zygnematophyceae	Necchi 2004	Brazil; also studied temperatures 10, 15, 20, 30 ° C
96.	Thorea hispida	D	mg O_2 (g DM)$^{-1}$ hr^{-1}	6.2	7.2	25	7.20	Rhodophyta: Florideophyceae	Necchi & Zucchi 2001	Brazil, freshwater; dark respiration measured for 45 minutes; temperature closest to the naturally encountered is chosen; studied temperatures 10, 15, 20, 25 °C; no change of respiration between 20 and 25 °C
97.	Thorea hispida	D	mg O_2 (g DM)$^{-1}$ hr^{-1}	6.2	10.4	25	10.40	Rhodophyta: Florideophyceae	Necchi 2004	Brazil; also studied temperatures 10, 15, 20, 30 ° C
98.	Udotea flabellum	Chl	μmol O_2 (mg Chl a)$^{-1}$ hr^{-1}	2.8	0.3	23	0.32	Chlorophyta: Udoteaceae	Reiskind & Bowes 1991	Florida, Gulf of Mexico; measurements of dark respiration at predetermined optimum temperature
99.	Ulothrix zonata	D	mg O_2 (mg DM)$^{-1}$ hr^{-1}	2.00	2.3	15	3.22	Chlorophyta: Ulvophyceae	Graham et al. 1985	Lake Huron, USA; prolonged darkness
100.	Ulothrix zonata	D	mg O_2 (mg DM)$^{-1}$ hr^{-1}	2.68	3	10	4.97	Chlorophyta: Ulvophyceae	Graham et al. 1985	Lake Huron, USA
101.	Ulothrix zonata	D	mg O_2 (mg DM)$^{-1}$ hr^{-1}	3.06	3.6	15	5.04	Chlorophyta: Ulvophyceae	Graham et al. 1985	Lake Huron, USA
102.	Ulothrix zonata	D	mg O_2 (mg DM)$^{-1}$ hr^{-1}	3.01	3.5	20	4.14	Chlorophyta: Ulvophyceae	Graham et al. 1985	Lake Huron, USA

103.	Ulva lactuca	W	μmol O_2 (g WM)$^{-1}$ hr^{-1}	24	3.0	10	4.97	Phaeophyta	Skene 2004	Scotland; mean temperature of coastal North Sea; measurements were taken over a 10-min period, which was long enough to observe a constant rate of change of O_2 concentration; data requested from the author (author's reply to A.M. Makarieva of 07.08.2006)
104.	Unknown sp. (CW / MC 56)	D	μmol CO_2 (g WM)$^{-1}$ hr^{-1} at DM/WM = 0.218	10.07	1.72	0	3.99	Rhodophyta	Weykam et al. 1996	Antarctic species; Chl a/DM = 0.0029
105.	Urospora penicilliformis	D	μmol CO_2 (g WM)$^{-1}$ hr^{-1} at DM/WM = 0.162	29.09	6.7	0	15.54	Chlorophyta: Ulvophyceae	Weykam et al. 1996	Antarctic species; Chl a/DM = 0.012
106.	Vaucheria fontinalis	D	mg O_2 (g DM)$^{-1}$ hr^{-1}	8.5	14	25	14.00	Ochrophyta: Xanthophyceae	Necchi 2004	Brazil; also studied temperatures 10, 15, 20, 30 ° C

Examples of ***qou*** to ***qWkg*** conversions:

Acrosiphonia penicilliformis ***qou*** **= 1.56 μmol O_2 (g WM)$^{-1}$ hr^{-1}** = 1.56 × 22.4 μl O_2 (0.001 kg WM)$^{-1}$ hr^{-1} = 35 ml O_2 (kg WM)$^{-1}$ (3600 s)$^{-1}$ = 35 × 20 J (kg WM)$^{-1}$ (3600 s)$^{-1}$ = **0.2 W (kg WM)$^{-1}$ =** ***qWkg***

Chara braunii ***qou*** **= 1.31 μg O_2 (g DM)$^{-1}$ hr^{-1}** = 1.31/32 × 22.4 × 0.001 ml O_2 × (20 J / ml O_2) (0.001 kg DM)$^{-1}$ (3600 s)$^{-1}$ = 5.1 W (kg DM)$^{-1}$ = 5.1 × **0.3** W (kg WM)$^{-1}$ = **1.5 W (kg WM)$^{-1}$ =** ***qWkg***

Gymnogongrus antarcticus ***qou*** **= 2.5 μmol CO_2 (g WM)$^{-1}$ hr^{-1} (at DM/WM = 0.11)** = 2.5 × 22.4 × 0.001 ml O_2 × (20 J / ml O_2) / **0.11** (0.001 kg DM)$^{-1}$ (3600 s)$^{-1}$ = 2.8 W (kg DM)–1 = **2.8** × **0.3 W (kg WM)$^{-1}$ =** ***qWkg***

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