

*The following supplement accompanies the article*

## **Growth, Filtration and Respiration Under Superfluous Feeding in Single-Osculum *Halichondria panicea* Sponges**

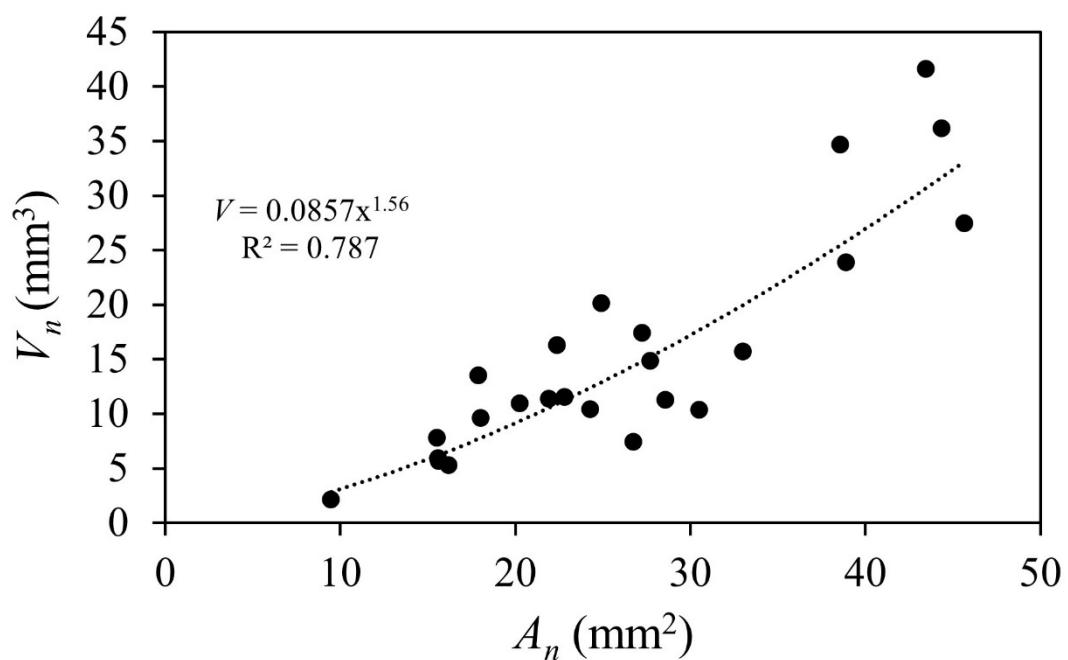
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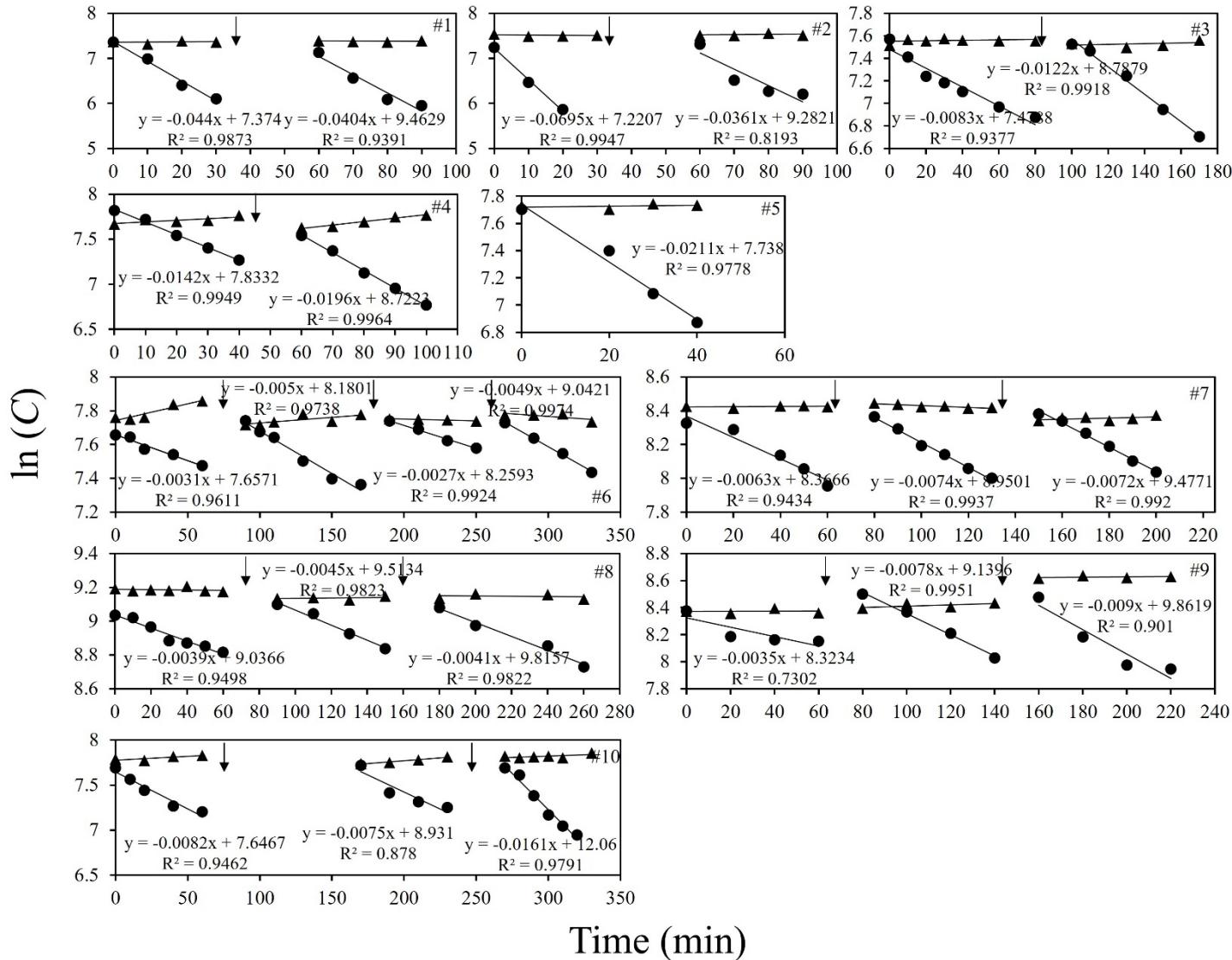
*2 Nordcee, Department of Biology, University of Southern Denmark, 5230 Odense, Denmark*

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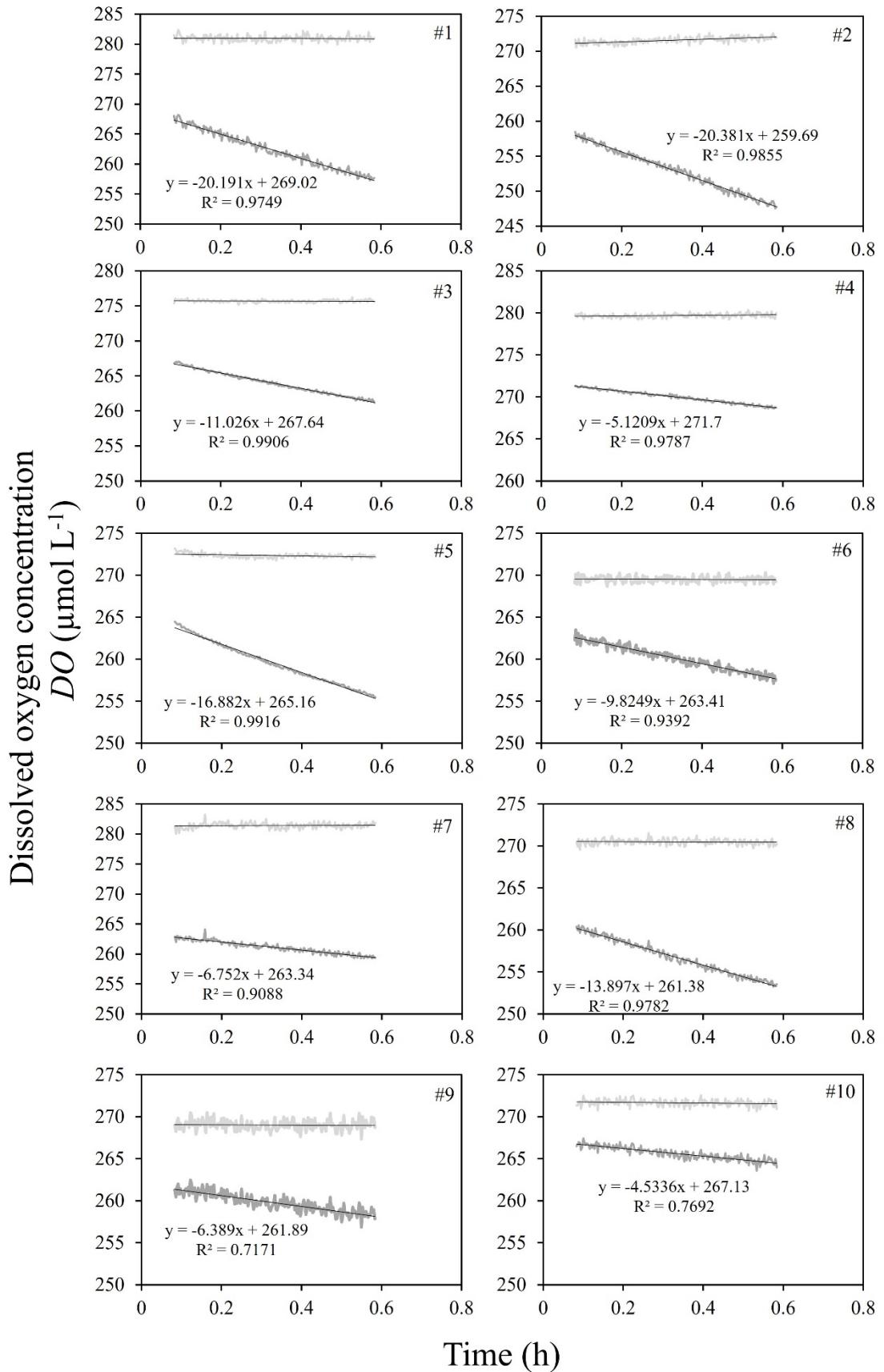
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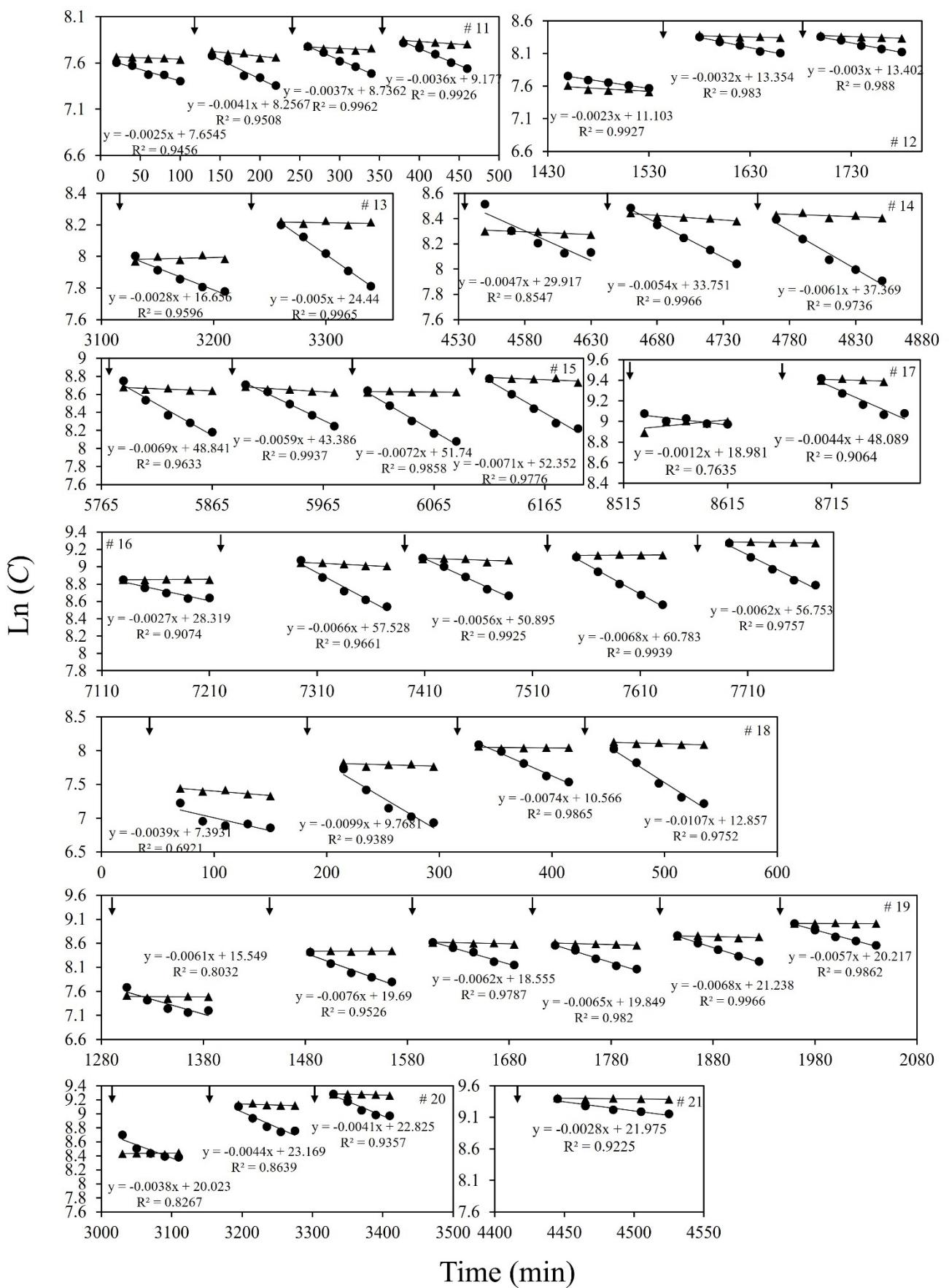
**Figure S1.** Relationship between the volume ( $V_n$ ) and the base area ( $A_n$ ) of *H. panicea* sponge explants fastening on microscopic glass slides.



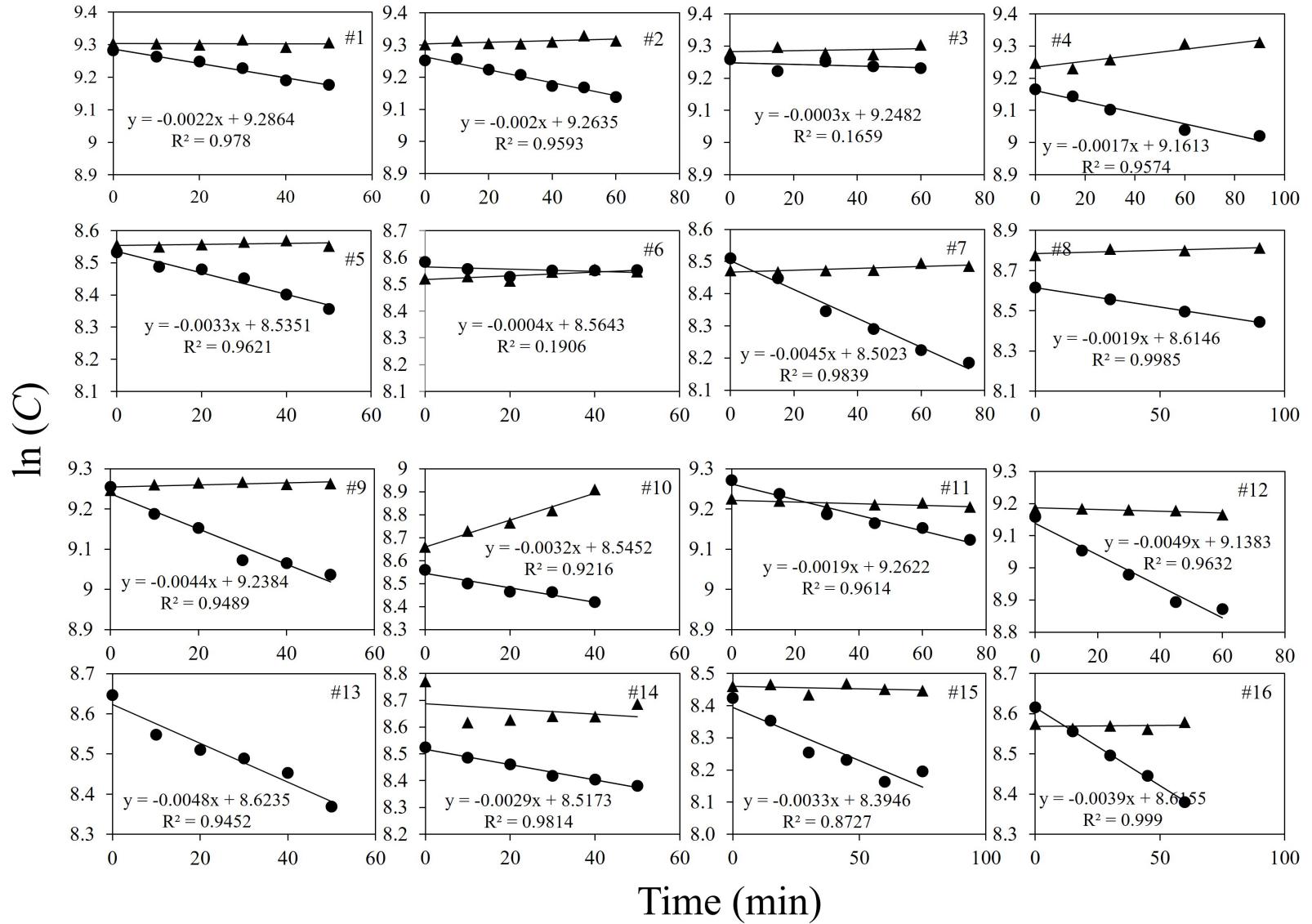
**Figure S2. Experiment I-A.** Semi- $\ln$  plots showing the natural logarithm of the algal concentration ( $C$ , cells  $\text{mL}^{-1}$ ) as a function of time in series of short-term filtration rate measurements with groups (ID1 – ID10) of *H. panicea* explants (dotted symbol) (Table S1). A chamber with glass slides without explants served as control (triangular symbol). Linear regression lines and their equations are shown. Arrows indicate the addition of *R. salina* algal cells to the aquarium.



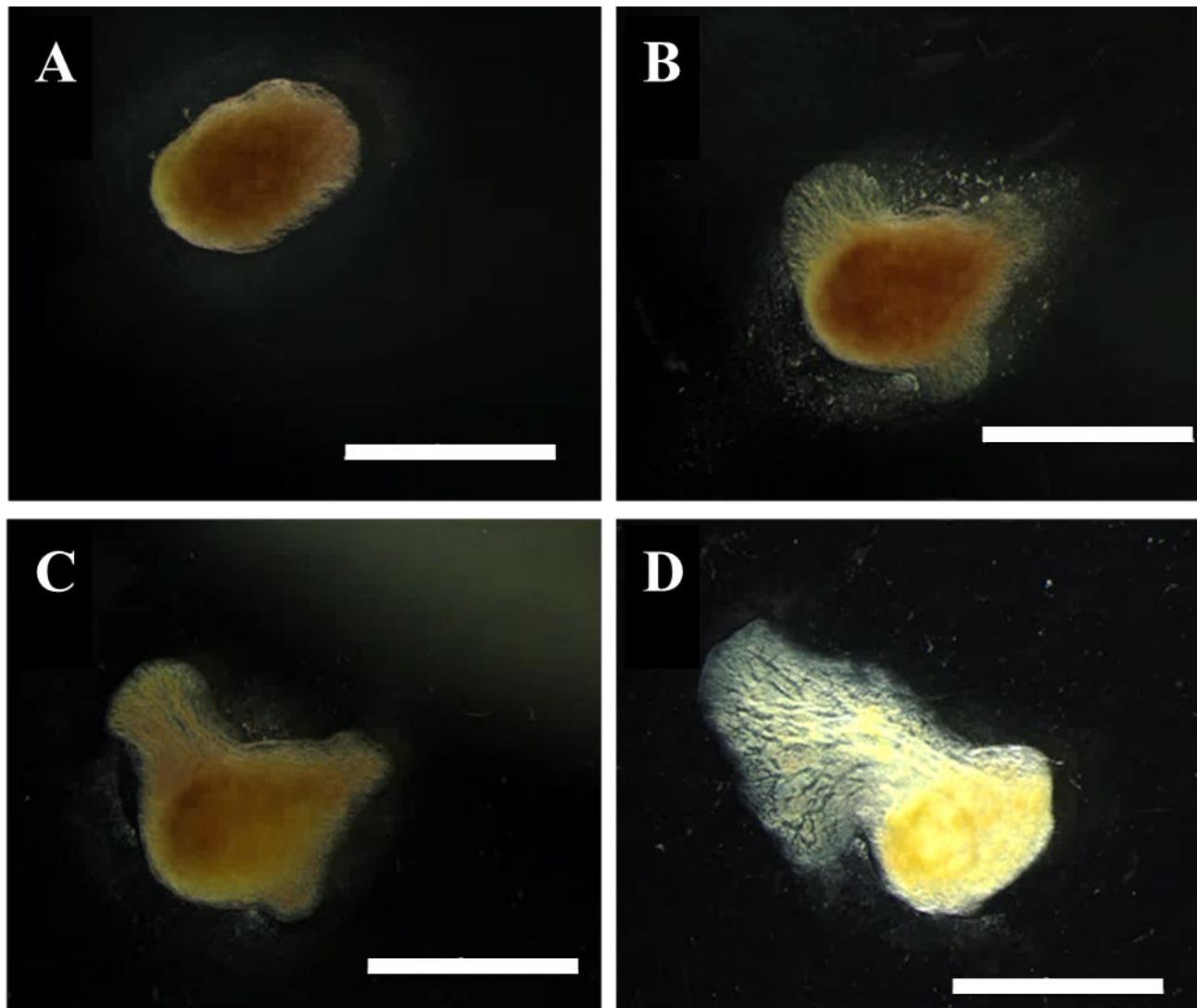
**Figure S3.** Experiment I-B. Dissolved oxygen concentration (DO, μmol L<sup>-1</sup>) as a function of time in respiration rate measurements with groups (ID1 – ID10) of *H. panicea* explants in experimental chamber (dark line) with well-mixed 0.2 μm filtered seawater (20 PSU) (Table 2). A chamber with glass slides without explants served as control (grey line). Linear regression lines and their equations are shown.



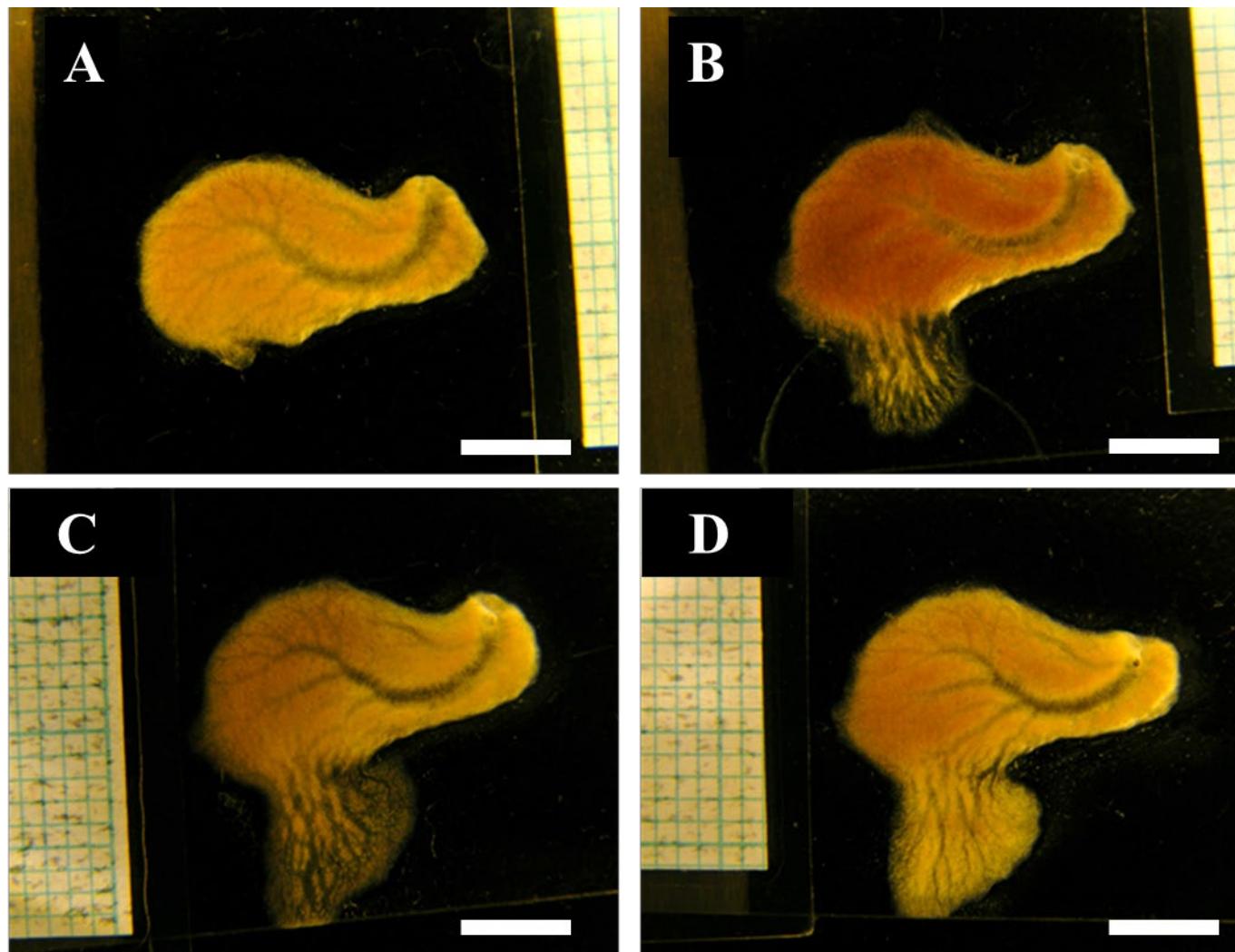
**Figure S4. Experiment II.** Semi–ln plots showing the natural logarithm of the algal concentration ( $C$ , cells  $\text{mL}^{-1}$ ) as a function of time in series of long-term filtration rate measurements with groups (ID8 & ID9) of *H. panicea* explants (dotted symbol) (Table S2). A chamber with glass slides without explants served as control (triangular symbol). Linear regression lines and their equations are shown. Arrows indicate the addition of *R. salina* algal cells to the aquarium.



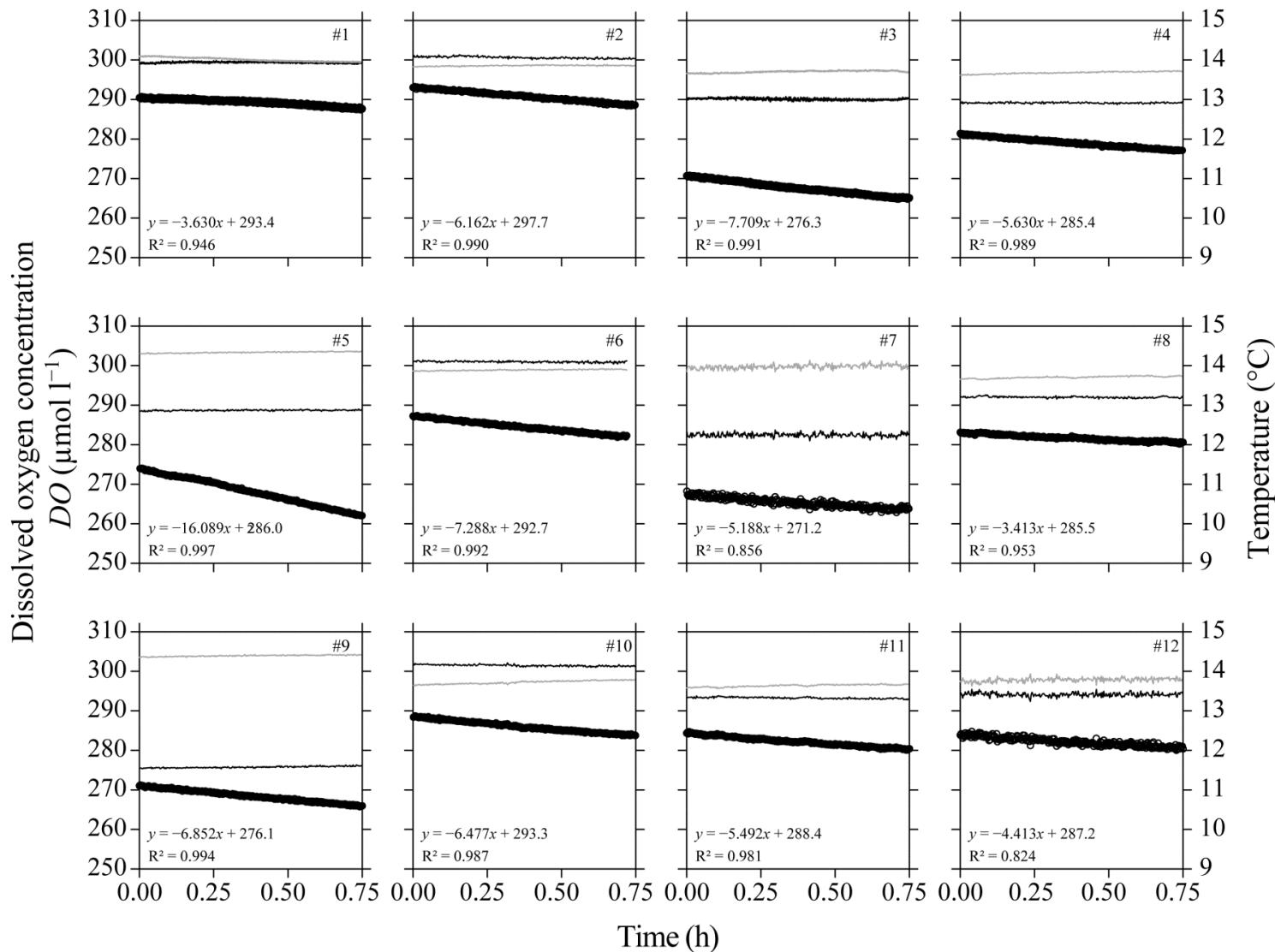
**Figure S5.** Experiment III-B. Semi–ln plots showing the natural logarithm of the algal concentration ( $C$ , cells  $\text{mL}^{-1}$ ) as a function of time in series of filtration rate measurements (dotted symbol) with *H. panicea* explants of different size classes (SC1: #1 to #8; SC2: #9 to #16) fed with two intended high algal concentrations of 10,000 cells  $\text{mL}^{-1}$  and 5000 cells  $\text{mL}^{-1}$ , respectively, during growth experiments lasting 23 to 24 days (Table S4). A chamber with glass slides without explants served as control (triangular symbol). Linear regression lines and their equations are shown.



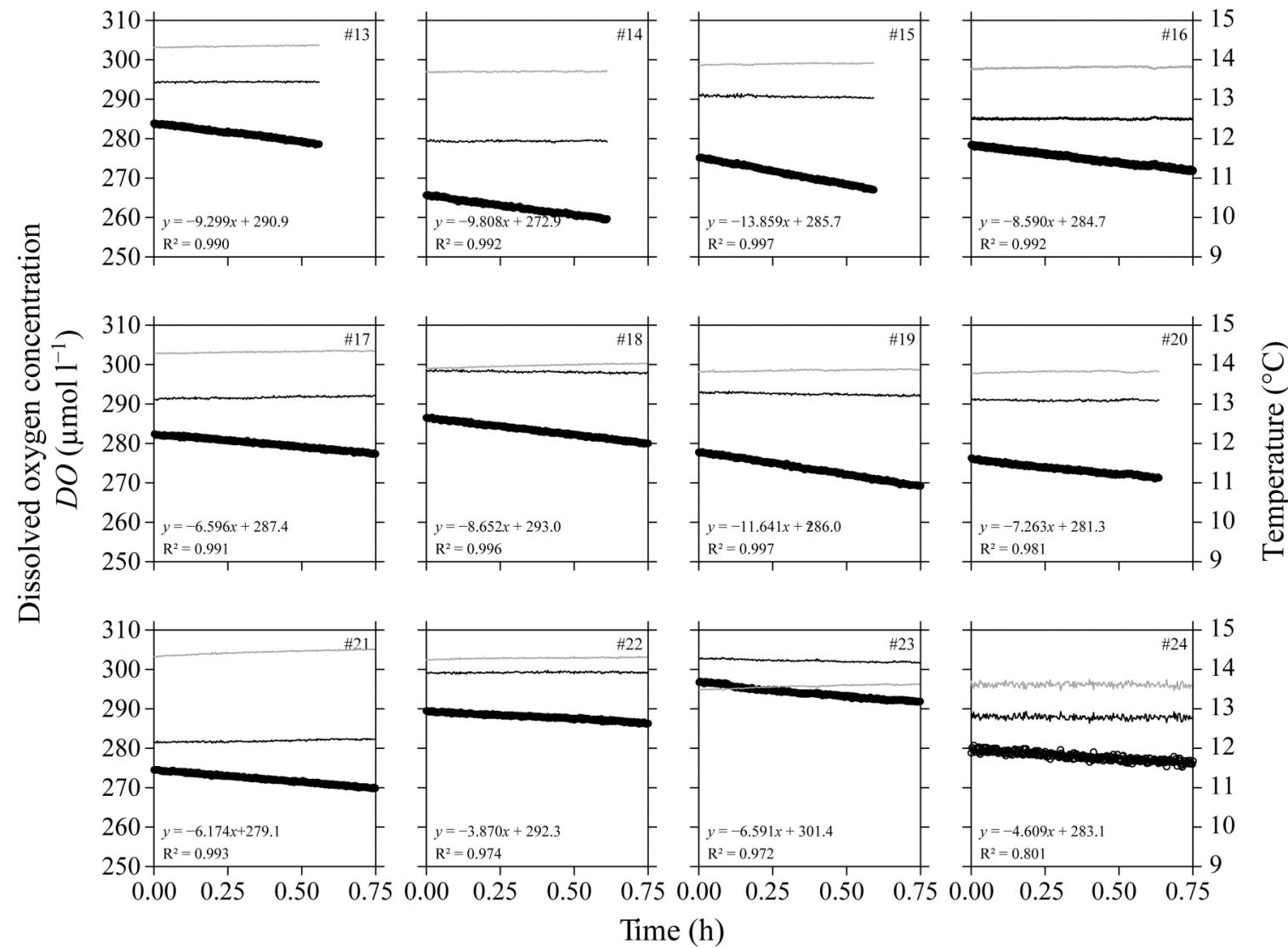
**Figure S6. Experiment III-A.** Growth of a *H. panicea* sponge explant of size class SC1 fed with a mean *Rhodomonas salina* algal concentration ( $C_m$ ) of  $11,037 \pm 2141$  cells  $\text{mL}^{-1}$  (see Table S3) during laboratory growth experiments. A: day 5, B: day 10, C: day 15 and D: day 24. Scale bars = 5 mm.



**Figure S7. Experiment III-A.** Growth of a *H. panicea* sponge explant of size class SC2 fed with a mean *Rhodomonas salina* algal concentration ( $C_m$ ) of  $9598 \pm 2369$  cells  $\text{mL}^{-1}$  (see Table S3) during laboratory growth experiments. A: day 5, B: day 10, C: day 15 and D: day 23. Scale bars = 5 mm.



**Figure S8.** Experiment III–C. Dissolved oxygen concentration ( $DO$ ,  $\mu\text{mol L}^{-1}$ ) as a function of time in series of respiration rate measurements with fed (#1 to #4:  $\sim 10,000$  cells  $\text{mL}^{-1}$ ; #5 to #8:  $\sim 5000$  cells  $\text{mL}^{-1}$ ) and starved (#9 to #12) *H. panicea* explants of SC1 in experimental chamber (heavy black line) with well-mixed 0.2  $\mu\text{m}$  filtered seawater (20 PSU) (Table S5). A chamber with glass slides without explants served as control (narrow black line). Equations of the linear regression lines are shown. The temperature (grey line) and the  $DO$  were recorded every 10 s.



**Figure S9.** Dissolved oxygen concentration ( $DO$ ,  $\mu\text{mol L}^{-1}$ ) as a function of time in series of respiration rate measurements (*Experiment III-C*) with fed (#13 to #16:  $\sim 10,000$  cells  $\text{mL}^{-1}$ ; #17 to #20:  $\sim 5000$  cells  $\text{mL}^{-1}$ ) and starved (#21 to #24) *H. panicea* explants of SC2 in experimental chamber (heavy black line) with well-mixed 0.2  $\mu\text{m}$  filtered seawater (20 PSU) (Table S5). A chamber with glass slides without explants served as control (narrow black line). Equations of the linear regression lines are shown. The temperature (grey line) and the  $DO$  were recorded every 10 s.

**Table S1. Experiment I-A:** Series of short-term filtration rate measurements (Series #1 to #10) with groups of *H. panicea* explants (group identification number = *ID*) on glass slides exposed to various algal concentrations. Number (*n*) of sponge explants, explant-specific volume (*V<sub>n</sub>*), wet weight (*WW<sub>n</sub>*), dry weight (*W<sub>n</sub>*), initial (*C<sub>0</sub>*), final (*C<sub>t</sub>*), and mean algal concentration [*C<sub>m</sub>* =  $\sqrt{C_0 \times C_t}$ ] during the experiment of duration time (*t*), estimated explant-specific filtration (*F<sub>n</sub>*), ingestion rate (*I<sub>n</sub>* = *F<sub>n</sub>* × *C<sub>m</sub>*), volume- (*F<sub>n</sub>/V<sub>n</sub>*) and dry weight-specific filtration rate (*F<sub>n</sub>/W<sub>n</sub>*).

Series	<i>ID</i>	<i>n</i>	<i>V<sub>n</sub></i> (mL)	<i>WW<sub>n</sub></i> (g)	<i>W<sub>n</sub></i> (g)	<i>t</i> (min)	<i>C<sub>0</sub></i> (cells mL <sup>-1</sup> )	<i>C<sub>t</sub></i> (cells mL <sup>-1</sup> )	<i>C<sub>m</sub></i> (cells mL <sup>-1</sup> )	<i>F<sub>n</sub></i> (mL min <sup>-1</sup> )	<i>I<sub>n</sub></i> (cells min <sup>-1</sup> )	<i>F<sub>n</sub>/V<sub>n</sub></i> (mL min <sup>-1</sup> mL <sup>-1</sup> )	<i>F<sub>n</sub>/W<sub>n</sub></i> (mL min <sup>-1</sup> g <sup>-1</sup> )
#1	1	6	0.280	0.280	0.019	0 - 30	1588	445	841	1.10	925	3.93	59.27
	1	6	0.280	0.280	0.019	60 - 90	1263	385	697	1.08	751	3.85	58.05
#2	1	6	0.280	0.280	0.019	0 - 20	1408	351	703	1.85	1303	6.62	99.87
	1	6	0.280	0.280	0.019	60 - 90	1512	493	863	1.02	883	3.65	55.12
#3	2	12	0.027	0.027	0.003	0 - 80	1943	967	1371	0.11	152	4.10	32.89
	2	12	0.027	0.027	0.003	100 - 170	1862	816	1233	0.16	201	6.02	48.34
#4	3	13	0.010	0.010	0.002	0 - 40	2485	1431	1886	0.11	206	10.92	67.03
	3	13	0.010	0.010	0.002	60 - 100	1886	871	1282	0.15	193	15.08	92.52
#5	4	12	0.042	0.042	0.005	0 - 40	2215	963	1460	0.23	334	5.44	49.20
#6	5	14	0.017	0.017	0.002	0 - 60	2115	1764	1932	0.03	64	1.95	13.84
	5	14	0.017	0.017	0.002	90 - 170	2305	1575	1905	0.05	88	2.73	19.34
	5	14	0.017	0.017	0.002	190 - 250	2300	1961	2124	0.03	53	1.47	10.44
	5	14	0.017	0.017	0.002	270 - 330	2273	1695	1963	0.05	89	2.68	18.95
#7	6	11	0.032	0.032	0.004	0 - 60	4133	2851	3433	0.07	256	2.33	19.54
	6	11	0.032	0.032	0.004	80 - 130	4297	2986	3582	0.09	313	2.73	22.96
	6	11	0.032	0.032	0.004	150 - 200	4365	3093	3674	0.09	313	2.66	22.34
#8	7	12	0.022	0.022	0.003	0 - 60	8393	6551	7415	0.04	313	1.92	14.58
	7	12	0.022	0.022	0.003	90 - 150	8938	6901	7854	0.05	383	2.22	16.82
	7	12	0.022	0.022	0.003	180 - 260	8783	6183	7369	0.06	471	2.91	22.06
#9	5	14	0.039	0.039	0.004	0 - 60	4337	3471	3880	0.03	126	0.83	7.38
	5	14	0.039	0.039	0.004	80 - 140	4910	3067	3881	0.07	281	1.86	16.46
	5	14	0.039	0.039	0.004	160 - 220	4809	2822	3684	0.08	308	2.14	18.99
#10	6	11	0.062	0.062	0.006	0 - 60	2190	1345	1716	0.10	166	1.56	15.70
	6	11	0.062	0.062	0.006	170 - 230	2249	1407	1779	0.09	158	1.43	14.36
	6	11	0.062	0.062	0.006	270 - 320	2188	1012	1488	0.19	285	3.09	31.01
							Mean (±SD)		2721 (±2049)	0.28 (±0.45)	345 (±300)	3.76 (±3.12)	33.88 (±24.99)

**Table S2. Experiment II.** Long-term filtration rate measurements (series #11 to #21) with two groups of *H. panicea* explants (group identification number = *ID*) on glass slides exposed to gradually increasing algal concentrations over several days (Day). Number (*n*) of all sponge explants on glass slides, Number (*n*) of all sponge explants on glass slides, explant-specific volume (*V<sub>n</sub>*), initial (*C<sub>0</sub>*), final (*C<sub>t</sub>*) and mean algal concentration [*C<sub>m =  $\sqrt{C_0 \times C_t}$ ] during the experiment of duration time (*t*), estimated explant-specific filtration (*F<sub>n</sub>*) and ingestion rate (*I<sub>n</sub>* = *F<sub>n</sub>* × *C<sub>m</sub>*), volume- (*F<sub>n</sub>/V<sub>n</sub>*) and dry weight-specific explant filtration rate (*F<sub>n</sub>/W<sub>n</sub>*). Grey rows indicate first clearance experiments of the series.</sub>*

Series	<i>ID</i>	Day	<i>n</i>	<i>V<sub>n</sub></i> (mL)	<i>WW<sub>n</sub></i> (g)	<i>W<sub>n</sub></i> (g)	<i>t</i> (min)	<i>C<sub>0</sub></i> (cells mL <sup>-1</sup> )	<i>C<sub>t</sub></i> (cells mL <sup>-1</sup> )	<i>C<sub>m</sub></i> (cells mL <sup>-1</sup> )	<i>F<sub>n</sub></i> (mL min <sup>-1</sup> )	<i>I<sub>n</sub></i> (cells min <sup>-1</sup> )	<i>F<sub>n</sub>/V<sub>n</sub></i> (mL min <sup>-1</sup> mL <sup>-1</sup> )	<i>F<sub>n</sub>/W<sub>n</sub></i> (mL min <sup>-1</sup> g <sup>-1</sup> )
#11	8	1	12	0.013	0.013	0.0019	20 - 100	2005	1641	1814	0.023	42	1.81	11.86
							140 - 220	2161	1564	1838	0.038	69	2.97	19.44
							260 - 340	2388	1784	2064	0.034	70	2.68	17.55
							380 - 460	2481	1881	2160	0.033	71	2.61	17.07
#12	8	2	12	0.013	0.013	0.0019	1450 - 1530	2334	1931	2123	0.021	45	1.67	10.91
							1580 - 1660	4241	3315	3750	0.029	110	2.32	15.18
							1700 - 1780	4252	3377	3789	0.028	104	2.18	14.23
#13	8	3	12	0.013	0.013	0.0019	3130 - 3210	2989	2389	2672	0.026	69	2.03	13.28
							3260 - 3340	3642	2467	2997	0.046	137	3.63	23.71
#14	8	4	12	0.013	0.013	0.0019	4550 - 4630	4990	3401	4120	0.043	177	3.41	22.29
							4660 - 4740	4836	3107	3876	0.050	192	3.92	25.61
							4770 - 4850	4415	2714	3462	0.056	194	4.43	28.93
#15	8	5	12	0.013	0.013	0.0019	5785 - 5865	6309	3576	4750	0.062	296	4.93	32.25
							5895 - 5975	6045	3823	4807	0.054	260	4.28	27.98
							6005 - 6085	5664	3224	4273	0.060	255	4.72	30.82
							6115 - 6195	6463	3722	4905	0.065	319	5.15	33.67
#16	8	6	12	0.013	0.013	0.0019	7130 - 7210	6987	5649	6282	0.025	155	1.96	12.80
							7295 - 7375	8735	5109	6680	0.061	404	4.79	31.30
							7408 - 7488	8938	5797	7198	0.051	370	4.06	26.56
							7551 - 7631	9053	5223	6876	0.062	429	4.93	32.25
							7693 - 7773	10,639	6549	8347	0.057	474	4.50	29.40
#17	8	7	12	0.013	0.013	0.0019	8535 - 8615	8752	7888	8309	0.011	91	0.87	5.69
							8705 - 8785	12,329	8761	10,393	0.040	419	3.19	20.87
#18	9	1	12	0.018	0.018	0.0025	70 - 150	1370	949	1140	0.039	44	2.14	15.43
							215 - 295	2271	1029	1529	0.099	196	5.43	39.17
							335 - 415	3259	1873	2471	0.074	379	4.06	29.28

					455 - 535	3057	1359	2038	0.107	597	5.87	42.33		
#19	9	2	12	0.018	0.018	0.0025	1305 - 1385	2173	1343	1708	0.061	974	3.34	24.13
							1485 - 1565	4522	2433	3317	0.077	1230	4.22	30.46
							1605 - 1685	5554	3465	4387	0.062	1502	3.40	24.53
							1725 - 1805	5219	3186	4078	0.065	1767	3.56	25.72
							1845 – 1925	6381	3717	4870	0.068	2098	3.73	26.90
							1960 – 2040	8219	5195	6534	0.057	2470	3.12	22.55
#20	9	3	12	0.018	0.018	0.0025	3030 - 3110	5998	4360	5114	0.038	3132	2.08	15.03
							3195 - 3275	8984	6361	7560	0.044	3465	2.41	17.41
							3330 - 3410	10,738	7865	9190	0.041	3842	2.25	16.22
#21	9	4	12	0.018	0.018	0.0025	4445 - 4525	11,979	9443	10,636	0.028	4697	1.53	11.08
								Mean (± SD)	4706 (± 2512)	0.053 (± 0.022)	243 (± 145)	3.62 (± 1.32)	24.57 (± 8.98)	

**Table S3.** Experiment III–A. Growth of *H. panicea* explants on glass slides in filtered (0.2 µm) seawater (20 PSU, 14 °C) added two intended algal concentrations of 10,000 and 5000 cells mL<sup>-1</sup>, respectively. Size class ( $SC1 = A_n > 20 \text{ mm}^2$ ,  $SC2 = 40 < A_n < 80 \text{ mm}^2$ ) and number of explant individuals ( $n$ ), day ( $t$ ), time interval between size measurements ( $\Delta t$ ), mean algal concentration ( $C_m$ ), corresponding estimated chlorophyll *a* concentration (Chl *a*), measured mean sponge explant base area ( $A_n$ ), mean explant volume ( $V_n$ ) and explant wet weight ( $WW_n$ ), estimated dry weight ( $W_n$ ), and instantaneous volume ( $\mu(V_n)$ )- and dry weight-specific growth rate ( $\mu(W_n)$ ).

<i>SC</i> #	<i>n</i>	<i>t</i> (d)	$\Delta t$ (d)	$C_m$ (cells mL <sup>-1</sup> )	Chl <i>a</i> (µg L <sup>-1</sup> )	$A_n$ (mm <sup>2</sup> )	$V_n$ (mm <sup>3</sup> )	$WW_n$ (mg)	$W_n$ (mg)	$\mu(V_n)$ (% d <sup>-1</sup> )	$\mu(W_n)$ (% d <sup>-1</sup> )
1	12	1	-	-	-	$15.7 \pm 4.3$	$6.29 \pm 0.83$	6.29	1.16	-	-
		5	4	$11,911 \pm 3531$	$14.9 \pm 4.4$	$14.8 \pm 4.4$	$5.74 \pm 0.86$	5.74	1.09	-1.7	-2.3
		10	5	$11,506 \pm 2680$	$14.4 \pm 3.4$	$19.6 \pm 6.3$	$8.89 \pm 1.51$	8.89	1.50	6.4	8.8
		15	5	$10,667 \pm 763$	$13.4 \pm 1.0$	$27.7 \pm 9.7$	$15.25 \pm 2.97$	15.25	2.22	7.9	10.8
		24	9	$10,032 \pm 459$	$12.6 \pm 0.6$	$39.7 \pm 15.1$	$26.74 \pm 5.92$	26.74	3.34	4.6	6.2
	12	1	-	-	-	$12.6 \pm 4.2$	$4.46 \pm 0.80$	4.46	0.90	-	-
		5	4	$6049 \pm 2158$	$7.6 \pm 2.7$	$12.1 \pm 4.0$	$4.19 \pm 0.75$	4.19	0.86	-1.2	-1.6
		10	5	$4314 \pm 787$	$5.4 \pm 1.0$	$14.7 \pm 4.9$	$5.68 \pm 1.02$	5.68	1.08	4.4	6.1
		15	5	$5267 \pm 601$	$6.6 \pm 0.8$	$17.6 \pm 6.9$	$7.52 \pm 1.74$	7.52	1.32	4.1	5.6
		24	9	$5211 \pm 648$	$6.5 \pm 0.8$	$20.5 \pm 8.0$	$9.53 \pm 2.20$	9.53	1.57	1.9	2.6
13	12	1	-	-	-	$11.1 \pm 2.8$	$3.66 \pm 0.43$	3.66	0.78	-	-
		5	4	-	-	$9.8 \pm 2.3$	$3.02 \pm 0.31$	3.02	0.68	-3.5	-4.9
		10	5	-	-	$10.1 \pm 3.0$	$3.16 \pm 0.48$	3.16	0.70	0.7	0.9
		15	5	-	-	$9.3 \pm 2.1$	$2.78 \pm 0.27$	2.78	0.64	-1.9	-2.6
		23	8	-	-	$7.7 \pm 1.6$	$2.07 \pm 0.18$	2.07	0.52	-2.7	-3.7
	13	6	1	-	-	$74.6 \pm 23.1$	$71.52 \pm 11.49$	71.52	6.85	-	-
		5	4	$10,629 \pm 3612$	$13.3 \pm 4.5$	$69.8 \pm 21.6$	$64.48 \pm 10.34$	64.48	6.35	-1.9	-2.6
		10	5	$8107 \pm 2061$	$10.1 \pm 2.6$	$89.3 \pm 24.6$	$94.69 \pm 12.67$	94.69	8.41	5.6	7.7
		15	5	$9492 \pm 1616$	$11.9 \pm 2.0$	$97.9 \pm 27.6$	$109.30 \pm 15.16$	109.30	9.34	2.1	2.9
		23	8	$10,087 \pm 1583$	$12.6 \pm 2.0$	$92.6 \pm 29.2$	$100.21 \pm 16.56$	100.21	8.76	-0.8	-1.1
		6	1	-	-	$62.7 \pm 8.4$	$54.54 \pm 2.37$	54.54	5.62	-	-
2	6	5	4	$5960 \pm 2500$	$7.5 \pm 3.1$	$59.2 \pm 7.9$	$49.87 \pm 2.15$	49.87	5.27	-1.6	-2.2
		10	5	$4024 \pm 1312$	$5.0 \pm 1.6$	$70.8 \pm 9.9$	$65.92 \pm 3.06$	65.92	6.46	4.1	5.6
		15	5	$4387 \pm 1046$	$5.5 \pm 1.3$	$77.1 \pm 14.9$	$75.30 \pm 5.80$	75.30	7.11	1.9	2.7
		23	8	$4857 \pm 590$	$6.1 \pm 0.7$	$74.5 \pm 13.8$	$71.37 \pm 5.14$	71.37	6.84	-0.5	-0.7
		6	1	-	-	$40.2 \pm 19.5$	$27.26 \pm 8.82$	27.26	3.39	-	-
	6	5	4	-	-	$41.7 \pm 20.7$	$28.87 \pm 9.68$	28.87	3.53	1.0	1.4
		10	5	-	-	$42.2 \pm 19.5$	$29.41 \pm 8.82$	29.41	3.58	0.3	0.4
		15	5	-	-	$36.8 \pm 16.7$	$23.75 \pm 6.92$	23.75	3.06	-3.1	-4.3
		23	8	-	-	$30.3 \pm 13.5$	$17.54 \pm 4.97$	17.54	2.46	-2.8	-3.8

**Table S4.** *Experiment III–B.* Filtration rate measurements (Series #1 to #16) with groups of *H. panicea* explants of two size classes (SC1 = 0 to 20 mm<sup>2</sup>, SC2 = 40 to 80 mm<sup>2</sup>) in incubation chamber ( $V$  = 100 to 130 mL) added two intended high algal concentrations ( $C$  = concentration of *Rhodomonas salina* cells) during growth experiments lasting 22 to 24 days. Number ( $n$ ), time (i.e. day) at which filtration rate was measured ( $t_{cl}$ ), mean algal concentration [ $C_m = (C_0 \times C_t)^{0.5}$ ] during the experiment, measured mean ( $\pm$  SD) explant base area ( $A_n$ ), estimated mean explant volume ( $V_n$ ) and wet weight ( $WW_n$ ), estimated mean dry weight ( $W_n$ ), estimated explant-specific filtration rate ( $F_n$ ), volume- ( $F_n/V_n$ ) and dry weight- specific filtration rate ( $F_n/W_n$ ). Means ( $\pm$  SD) are shown and indicated for the two treatments, 10,000 cells mL<sup>-1</sup> (\*) and 5000 cells mL<sup>-1</sup> (\*\*).

Series	SC	$C$ (cells mL <sup>-1</sup> )	$n$	$t_{cl}$ (d)	$C_m$ (cells mL <sup>-1</sup> )	$A_n$ (mm <sup>2</sup> )	$V_n$ (mL)	$WW_n$ (g)	$W_n$ (g)	$F_n$ (mL min <sup>-1</sup> )	$F_n/V_n$ (mL min <sup>-1</sup> mL <sup>-1</sup> )	$F_n/W_n$ (mL min <sup>-1</sup> g <sup>-1</sup> )				
1	1	10,000	12	6	10,189	$15.27 \pm 4.5$	0.0060	0.0060	0.0011	0.018	3.04	16.29				
			12	12	9850	$22.77 \pm 7.41$	0.0112	0.0112	0.0018	0.017	1.48	9.40				
			12	17	10,355	$30.69 \pm 11.17$	0.0179	0.0179	0.0025	0.003	0.14	1.00				
			12	24	8890	$39.75 \pm 15.13$	0.0268	0.0268	0.0033	0.014	0.53	4.23				
			5000	12	4	4651	$12.05 \pm 4.04$	0.0042	0.0042	0.0009	0.028	6.61	32.00			
				12	10	5260	$14.66 \pm 4.93$	0.0057	0.0057	0.0011	0.003	0.59	3.10			
				12	19	4222	$19.17 \pm 7.67$	0.0086	0.0086	0.0015	0.038	4.37	25.72			
				12	22	6237	$19.99 \pm 7.87$	0.0092	0.0092	0.0015	0.016	1.73	10.35			
9	2	10,000	6	5	9375	$69.81 \pm 21.61$	0.0645	0.0645	0.0064	0.095	1.47	14.95				
			6	12	4864	$95.12 \pm 26.01$	0.1045	0.1045	0.0090	0.070	0.67	7.75				
			6	15	10,355	$97.91 \pm 27.64$	0.1093	0.1093	0.0093	0.042	0.38	4.46				
			6	23	8228	$84.47 \pm 30.77$	0.0868	0.0868	0.0079	0.107	1.23	13.51				
			5000	6	3	4953	$59.73 \pm 8.02$	0.0506	0.0506	0.0053	0.103	2.04	19.42			
				6	8	4685	$65.36 \pm 8.44$	0.0582	0.0582	0.0059	0.063	1.09	10.74			
				6	14	4063	$76.64 \pm 14.02$	0.0746	0.0746	0.0071	0.072	0.96	10.14			
				6	22	4931	$75.18 \pm 14.25$	0.0724	0.0724	0.0069	0.085	1.17	12.30			
										Mean*	0.046	1.12	8.95			
										( $\pm$ SD)	( $\pm$ 0.037)	( $\pm$ 0.87)	( $\pm$ 5.22)			
										Mean**	0.051	2.32	15.47			
										( $\pm$ SD)	( $\pm$ 0.033)	( $\pm$ 1.96)	( $\pm$ 8.90)			

**Table S5. Experiment III–C.** Series of oxygen consumption measurements with groups of *H. panicea* explants of two size classes ( $SC1 = A_n > 20 \text{ mm}^2$ ,  $SC2 = 40 < A_n < 80 \text{ mm}^2$ ) fed at two intended algal concentrations ( $C$  = concentration of *Rhodomonas salina* algae) of  $10,000 \text{ cells mL}^{-1}$  and  $5000 \text{ cells mL}^{-1}$ , respectively, during growth experiments lasting 22 to 24 days. Number ( $n$ ), time (i.e. day) at which respiration was measured ( $t_R$ ), mean base area ( $A_n$ ), estimated mean volume ( $V_n$ ) and wet weight ( $WW_n$ ), estimated dry weight ( $W_n$ ), explant-specific respiration rate ( $R_n$ ), volume- ( $R_n/V_n$ ) and dry weight-specific respiration rate ( $R_n/W_n$ ), explant-specific filtration rate ( $F_n$ , see Table 3),  $F_n/R_n$  – ratio, and estimated oxygen extraction efficiency (EE). Means ( $\pm SD$ ) are shown.

Series	SC	C (cells mL <sup>-1</sup> )	n	$t_R$ (d)	$A_n$ (mm <sup>2</sup> )	$V_n$ (mL)	$WW_n$ (g)	$W_n$ (g)	$R_n$ (mL O <sub>2</sub> h <sup>-1</sup> )	$R_n/V_n$ (mL h <sup>-1</sup> mL <sup>-1</sup> )	$R_n/W_n$ (mL h <sup>-1</sup> g <sup>-1</sup> )	$F_n$ (L h <sup>-1</sup> )	$F_n/R_n$ (L H <sub>2</sub> O (mL <sup>-1</sup> O <sub>2</sub> ) <sup>-1</sup> )	EE (%)
1	1	10,000	12	5	$14.84 \pm 4.37$	0.0058	0.0058	0.0011	0.0011	0.1944	1.03	0.0011	0.98	16.2
2			12	12	$22.77 \pm 7.41$	0.0112	0.0112	0.0018	0.0019	0.1695	1.07	0.0010	0.53	30.2
3			12	17	$30.69 \pm 11.17$	0.0179	0.0179	0.0025	0.0024	0.1325	0.95	0.0002	0.06	100
4			12	23	$38.52 \pm 14.61$	0.0255	0.0255	0.0032	0.0017	0.0681	0.54	0.0009	0.49	32.4
5			12	4	$12.05 \pm 4.04$	0.0042	0.0042	0.0009	0.0050	1.2064	5.84	0.0017	0.33	48.3
6			12	10	$14.66 \pm 4.93$	0.0057	0.0057	0.0011	0.0023	0.4030	2.12	0.0002	0.09	100
7			12	19	$19.17 \pm 7.67$	0.0086	0.0086	0.0015	0.0016	0.1891	1.11	0.0023	1.39	11.5
8			12	22	$19.99 \pm 7.87$	0.0092	0.0092	0.0015	0.0011	0.1161	0.70	0.0010	0.89	17.8
9	0	0	13	5	$9.82 \pm 2.34$	0.0030	0.0030	0.0007	0.0019	0.6437	2.86	-	-	-
10			13	7	$9.83 \pm 2.58$	0.0030	0.0030	0.0007	0.0018	0.6086	2.71	-	-	-
11			13	13	$9.71 \pm 2.58$	0.0030	0.0030	0.0007	0.0016	0.5276	2.33	-	-	-
12			13	21	$8.09 \pm 1.57$	0.0022	0.0022	0.0005	0.0013	0.5627	2.30	-	-	-
13			6	5	$69.81 \pm 21.61$	0.0645	0.0645	0.0064	0.0059	0.0915	0.93	0.0057	0.97	16.4
14	2	10,000	6	12	$95.12 \pm 26.01$	0.1045	0.1045	0.0090	0.0062	0.0597	0.69	0.0042	0.67	23.6
15			6	15	$97.91 \pm 27.64$	0.1093	0.1093	0.0093	0.0088	0.0806	0.94	0.0025	0.28	55.9
16			6	23	$84.47 \pm 30.77$	0.0868	0.0868	0.0079	0.0055	0.0628	0.69	0.0064	1.17	13.5
17			6	3	$59.73 \pm 8.02$	0.0506	0.0506	0.0053	0.0042	0.0827	0.79	0.0062	1.48	10.7
18			6	8	$65.36 \pm 8.44$	0.0582	0.0582	0.0059	0.0055	0.0943	0.93	0.0038	0.69	22.9
19			6	14	$76.64 \pm 14.02$	0.0746	0.0746	0.0071	0.0074	0.0991	1.05	0.0043	0.58	27.3
20	0	0	6	22	$75.18 \pm 14.25$	0.0724	0.0724	0.0069	0.0046	0.0634	0.66	0.0051	1.11	14.3
21			6	5	$41.66 \pm 20.68$	0.0288	0.0288	0.0035	0.0039	0.1360	1.11	-	-	-
22			6	6	$42.06 \pm 20.69$	0.0293	0.0293	0.0036	0.0025	0.0842	0.69	-	-	-
23			6	13	$39.29 \pm 17.82$	0.0263	0.0263	0.0033	0.0042	0.1589	1.27	-	-	-
24			6	21	$31.57 \pm 14.14$	0.0187	0.0187	0.0026	0.0029	0.1557	1.13	-	-	-
					Mean ( $\pm SD$ )	0.0036 ( $\pm 0.0021$ )	0.2496 ( $\pm 0.2714$ )	1.44 ( $\pm 1.13$ )				0.73 ( $\pm 0.42$ )	33.8 ( $\pm 28.8$ )	