

Table 1. Mass-specific metabolic rates q ($W\text{ kg}^{-1}$) across life

Taxonomic group	<i>n</i>	<i>N</i>	U	Body mass, g			<i>T</i> , °C	<i>q</i> , $W\text{ kg}^{-1}$				<i>q_N</i> , $10^2 W$ (kg N^{-1})	Allometric scaling				
				Mean	Min.	Max.		Mean	Lower 95% C.I.	Upper 95% C.I.	% [1–10]		N/DM	α	β (95% C.I.)	R^2	<i>p</i>
Heterotrophs																	
Prokaryotes	173	245	D	7×10^{-13}	1×10^{-14}	4×10^{-11}	31 (5; 60)	4.6	0.32	68	57	0.1	1.5	5.15	0.37 (0.23)	0.09	0.0017
Protozoa	52	201	D	1×10^{-8}	9×10^{-12}	2×10^{-4}	20	7.5	0.71	80	60	0.1	2.6	0.37	-0.06 (0.07)	0.05	0.095
Insects	402	402	W	6×10^{-2}	8×10^{-5}	7	25	2.9	0.32	27	67	0.1	1.0	0.25	-0.18 (0.04)	0.19	<10 ⁻⁵
Aquatic invertebrates	376	989	W	9×10^{-2}	3×10^{-6}	1×10^4	11 (-1.7; 32)	1.3	0.07	26	49	0.1	0.4	-0.09	-0.21 (0.03)	0.41	<10 ⁻⁵
Crustacea: copepods and krill	138	314	W	2×10^{-3}	3×10^{-6}	6	13 (-1; 30)	3.0	0.23	39	56	0.1	1.0	-0.36	-0.30 (0.06)	0.46	<10 ⁻⁵
Crustacea: peracarids	86	226	W	7×10^{-2}	8×10^{-5}	5×10^1	12 (-1.5; 30)	1.4	0.06	29	57	0.1	0.4	-0.21	-0.28 (0.12)	0.21	10 ⁻⁵
Crustacea: decapods	80	197	W	5	5×10^{-4}	9×10^2	13 (-1.7; 30)	0.56	0.05	6	33	0.1	0.2	-0.05	-0.31 (0.09)	0.37	<10 ⁻⁵
Mollusca: cephalopods	38	218	W	4×10^1	1×10^{-3}	1×10^4	5	0.78	0.03	21	42	0.1	0.3	0.18	-0.18 (0.14)	0.16	0.014
Gelatinous invertebrates	34	34	W	2×10^{-1}	2×10^{-3}	2×10^1	5 (1; 15)	0.78	0.18	3.5	35	0.1	0.3	-1.05	-0.41 (0.08)	0.77	<10 ⁻⁵
Ectothermic vertebrates	580	7,498	W	3×10^2	2×10^{-2}	3×10^4	19 (-1.5; 45)	0.36	0.06	2.3	11	0.1	0.1	-0.21	-0.17 (0.03)	0.18	<10 ⁻⁵
Amphibians	158	682	W	8	2×10^{-1}	7×10^2	19 (4; 35)	0.39	0.09	1.6	9	0.1	0.1	-0.26	-0.16 (0.06)	0.16	<10 ⁻⁵
Fish	266	6,333	W	4×10^2	2×10^{-2}	7×10^3	14 (-1.5; 30)	0.38	0.04	3.2	15	0.1	0.1	-0.19	-0.15 (0.05)	0.11	<10 ⁻⁵
Reptiles	156	483	W	7×10^2	4×10^{-1}	3×10^4	26 (5; 45)	0.30	0.06	1.6	7	0.1	0.1	-0.13	-0.22 (0.04)	0.43	<10 ⁻⁵
Endothermic vertebrates	946	1,327	W	1×10^2	3	4×10^6	38	5.5	1.0	30	72	0.1	1.8	1.42	-0.31 (0.01)	0.75	<10 ⁻⁵
Birds	321	321	W	9×10^1	3	1×10^6	39	8.7	2.0	37	51	0.1	2.9	1.59	-0.34 (0.02)	0.84	<10 ⁻⁵
Mammals	625	1,006	W	2×10^2	3	4×10^6	37	4.4	0.87	22	83	0.1	1.5	1.30	-0.29 (0.01)	0.76	<10 ⁻⁵
Photoautotrophs																	
Cyanobacteria	25	75	D	2×10^{-11}	7×10^{-13}	6×10^{-9}	26 (2; 45)	3.7	0.24	58	60	0.06	2.1	1.73	0.12 (0.30)	0.03	0.46
Eukaryotic microalgae	47	193	C	9×10^{-10}	6×10^{-12}	6×10^{-6}	15 (0.5; 20)	8.8	1.3	58	51	0.08	3.7	0.85	-0.01 (0.09)	0.00	0.76
Eukaryotic macroalgae	88	106	D	n.d.	n.d.	n.d.	8 (0; 30)	2.1	0.19	36	57	0.02	3.2	n.d.	n.d.	n.d.	n.d.
Vascular plants: green leaves	271	271	D	n.a.	n.a.	n.a.	25	1.2	0.31	4.6	61	0.02	2.0	n.a.	n.a.	n.a.	n.a.
Vascular plants: tree saplings	4	119	D	70	0.7	2×10^2	24	0.51	0.19	1.4	6	0.005	3.4	1.09	0.02 (0.02)	0.00	0.19
Vascular plants: seedlings	42	418	D	8×10^{-1}	3×10^{-2}	7×10^1	24	3.6	1.6	8.3	99	0.03	4.0	0.15	0.06 (0.06)	0.03	0.054

n, number of species; *N*, number of data entries analyzed (statistics are based on *N* in seedlings and tree saplings and on *n* in all other groups); U, dominant mass units in the original data sources—metabolic rates reported mostly per dry (D), wet (W), or carbon (C) mass basis; for body mass, geometric mean, minimum, and maximum values in the group are shown; in seedlings and tree saplings, wet mass was estimated from dry mass data assuming a 30% dry mass to wet mass ratio; n.d., not determined; n.a., not applicable; *T*, mean and range of measurement temperatures in the data sources, and in endotherms mean body temperature from ref. 7. “Copepods and krill” comprise 85 copepod and 9 krill species, as well as 7 similarly sized branchiopods and 2 *Balanus* spp. “Peracarids” include amphipods, isopods, mysids, 2 cumaceans, as well as five (nonperacarid) ostracod species. “Gelatinous invertebrates” comprise medusae (28) and chaetognaths (29). “Cyanobacteria” include unicellular, filamentous and mat-forming species. “Eukaryotic microalgae” comprise diatoms, dinoflagellates, haptophytes, and unicellular chlorophytes; eukaryotic filaments are included in “Eukaryotic macroalgae”. Rows in boldface correspond to panels in Fig. 1. For mass-specific metabolic rate *q*, the geometric mean and 95% C.I. (assuming log-normal distribution) are shown; % [1–10] is percentage, in each group, of mass-specific metabolic rate values falling at or between 1 and 10 $W\text{ kg}^{-1}$; gelatinous medusae and chaetognaths have DMWM ratio significantly smaller [by 7 and 3 times, respectively (11, 30)] than the crude mean DMWM = 0.3 for the nongelatinous groups, their wet-mass-based metabolic rates were multiplied by a factor of 7 and 3, respectively, to be comparable with the rest of the database; N/DM is nitrogen mass to dry matter mass ratio, N/DM = 0.1 is a crude mean for the heterotrophic groups studied (Table S2); *q_N* is mean metabolic rate per unit nitrogen mass. All nonendothermic metabolic rates were converted to 25°C prior to analysis (see Methods). In the last 3 columns, parameters of ordinary least squares regression $\log_{10} q = \alpha + \beta \log_{10} M$, where *q* is in $W\text{ kg}^{-1}$ and *M* is in g, are given; R^2 and *p* are the squared correlation coefficient and significance level, respectively.