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Appendix S2

To generate a species x trait matrix, we first mined existing data sources (Barnett et al. 2007, Hébert et al. 2016). As these are the most comprehensive databases that we are aware of, we cross-referenced taxa from our lakes with these databases, and eliminated traits that were largely incomplete across most taxa. From these sources, we were able to find comprehensive data for the following: habitat (categorical: pelagic, littoral); feeding mode (categorical: stationary suspension, filter, raptorial, current cruiser); trophic level (categorical: herbivore, omnivore, omnivore-carnivore); body size (continuous); and body mass (continuous). Categorical traits were converted to binary form (0,1) and the trait state littoral was removed because it is perfectly correlated with the pelagic trait state. Because of uncertainties in body size measurements, this variable was converted to ordinal categories using quartiles of the continuous data to generate roughly even numbers of species within each category (in mm, category 1 = ≤ 0.614, category 2 = 0.615 – 0.880, category 3 = 0.881 – 1.140, category 4 = >1.140). To incorporate life history variation, we estimated species-specific egg development rate at 14ºC from existing formulae (Table S1). This water temperature was chosen as it represented the average of all lake water temperature profiles throughout the duration of the study. All trait data are summarized in Table S2.

Some categories present in original data sources were pooled here because of small sample sizes. This pooling was done for: 1) B-, C-, D-, and S-filtration species in Barnett et al. (2007) (combined to one category of filter feeders; Table S2); and 2) carnivores and more carnivororus omnivores (OmniCarn in Barnett et al. 2007) (combined to one category omnivore-carnivore; Table S2). If species and specific trait values were not present in existing trait

databases, we took three approaches to fill gaps (denoted in Table S2). First, if values from species within the same genus were present, they were used. Second, we searched the literature for additional values using Google Scholar. Third, we estimated some values with statistical models. The latter was used to estimate body mass for two species using known length-weight regressions (Bottrell et al. 1976). There were three species missing data on several traits. Two of these species, *Kurzia media* and *Oxyurella brevicaudis*, were removed, as they never comprised more than 1% of community abundance and were each present only once in our dataset. The third species, *Aglaodiaptomus leptopus*, was more prevalent; for this species, professional judgement was used to assign a category for feeding mode (stationary suspension), which is consistent with other diaptomid copepods (*Leptodiaptomus, Skistodiaptomus*).

Table S1. Model estimates of egg development time (K, days) for different crustacean zooplankton at 14ºC water temperature. *a*, *b*, and *c* refer to model coefficients.

Species	**Formula/ Source**	***a***	***b***	***c***	**K (days)**
Bosmina	1	3705848	-15.4	-3.11	4.189
Ceriodaphnia	1	1763	3.7	-1.28	3.712
Chydorus	1	138279	-4.9	-2.43	4.558
Diaphanosoma	1	1767	-1.9	-1.08	3.711
Daphnia	1	65912	-6.1	-2.12	4.742
Diaptomus	1	38474	-3.7	-2	5.117
Other cyclopoids	1	7590	-3.4	-1.4	5.798
Tropocyclops	2	18901	-4.8	-1.77	4.375
Diacyclops	2	18901	-4.8	-1.77	4.375
Holopedium	3	10.25638	1.2472	-0.5647	5.400
Polyphemus	3	10.25638	1.2472	-0.5647	5.400
Other cladocerans	3	10.25638	1.2472	-0.5647	5.400
Epischura	4				10.520

1) $K= (a(T-b)^c)/24$ (Cooley et al. 1986)
2) $K= (a(T-b)^c)/24$ (Borgmann et al. 1984)
3) $\ln K= \ln *a + b*\ln T + c(\ln T)^2$ (Bottrell et al. 1976)
4) $K = 0.0791T^2 - 3.7731T + 47.84$ (quadratic equation developed from data in Chen and Folt 1996)

Table S2. Species trait data. Some categories present in original data sources were pooled here because of small sample sizes (see text for details). If species was not present in existing trait databases or had incomplete trait data, either values from species within the same genus were used (indicated with *), literature searches were conducted (see Notes/References), or estimates were derived from statistical models (indicated with †).

Species	Habitat	Feeding	Trophic	Body length (mm)	Body size category	Egg development time (days, at 14 °C)	Body mass (mg)	Notes/References
Acanthocyclops robustus	Pelagic	Raptorial	Omnivore	1.14	3	5.80	0.0086	1,2
Aglaodiaptomus leptopus	Pelagic	Stationary suspension	Omnivore	1.74	4	5.12	0.0198	2, feeding (professional judgement)
*Alona setulosa**	Littoral	Filter	Herbivore	0.51	1	5.40	0.0015	1,2
Bosmina longirostris	Pelagic	Filter	Herbivore	0.37	1	4.19	0.0018	1,2
Camptocercus spp.	Littoral	Filter	Herbivore	0.78	2	5.40	0.0051	1,2
Ceriodaphnia lacustris	Pelagic	Filter	Herbivore	0.63	2	3.71	0.0007	1,2
Chydorus spp.*	Littoral	Filter	Herbivore	0.32	1	4.56	0.0030	1,2
Daphnia ambigua	Pelagic	Filter	Herbivore	0.88	2	4.74	0.0139	1,2
Daphnia mendotae	Pelagic	Filter	Herbivore	1.50	4	4.74	0.0332	1,2
Daphnia pulicaria	Pelagic	Filter	Herbivore	1.53	4	4.74	0.0050	1,2
Diacyclops thomasi	Pelagic	Raptorial	Omnivore-carnivore	0.89	3	4.38	0.0032	1,2
Diaphanosoma birgei	Littoral	Filter	Herbivore	0.61	1	3.71	0.0030	1,2
Epischura lacustris	Pelagic	Current-cruiser	Omnivore-carnivore	1.64	4	10.52	0.0173	1,2

Species	Habitat	Feeding	Trophic	Body length (mm)	Body size category	Egg development time (days, at 14 ºC)	Body mass (mg)	Notes/References
Holopedium gibberum	Pelagic	Filter	Herbivore	0.86	2	5.40	0.0051	1,2
*Latona glacialis**	Littoral	Filter	Herbivore	1.73	4	5.40	0.0050	1,2
*Leptodiaptomus novamexicanus**	Pelagic	Stationary suspension	Omnivore	0.96	3	5.12	0.0053	1,2
*Leptodiaptomus signicauda**	Pelagic	Stationary suspension	Omnivore	0.96	3	5.12	0.0053	1,2
Leydigia spp.	NA	Filter	Herbivore	0.75	2	5.40	0.0080	1,2
Macrothrix laticornis	NA	Filter	Herbivore	0.47	1	5.40	0.0022	1,2
Mesocyclops edax	Pelagic	Raptorial	Omnivore-carnivore	1.12	3	5.80	0.0117	1,2
*Microcyclops varicans**	Littoral	Raptorial	Omnivore	0.61	1	5.80	0.0006†	size (3), size and feeding (4), habitat (5)
Moina macrocopa	Pelagic	Filter	Omnivore	1.14	3	5.40	0.0040†	size (6), trophic (7), habitat (8)
Polyphemus pediculus	Pelagic	Raptorial	Omnivore-carnivore	0.83	2	5.40	0.0029	1,2
Skistodiaptomus oregonensis	Pelagic	Stationary suspension	Omnivore	1.20	4	5.12	0.0078	1,2
*Tropocyclops mexicanus**	Pelagic	Raptorial	Omnivore	0.60	1	4.38	0.0015	1,2

1) Barnett et al. (2007); 2) Hébert et al. (2016); 3) Reid (1992); 4) Soto and Hurlbert (1991); 5) Fairchild (1981); 6) Gu et al. (2017); 7) Kumar and Hwang (2008); 8) Santangelo et al. (2018)

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