Supporting Information

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Table S1. Taxa, sampling locations, weights and number of individuals used in comparative studies of cadmium bioaccumulation and detoxification

Order	Family	Genus species	Sampling location	Body Weight ± SD	*n*	Feeding
Ephemeroptera	Heptageniidae	*Mccaffertium ithaca*	36°22′10′′N, 80°59′30′′W	76.9 ± 4.5	40	0
Ephemeroptera	Heptageniidae	*Rhithrogena morrisoni*	40°39′30′′N, 122°55′30′′W	27.4 ± 1.3	22	0
Ephemeroptera	Isonychiidae	*Isonychia tusculanensis*	36°05′00′′N, 79°01′00′′W	51.5 ± 1.5	20	0
Ephemeroptera	Isonychiidae	*Isonychia sp.*	36°22′10′′N, 80°59′30′′W	48.2 ± 2.1	9	0
Ephemeroptera	Ephemerellidae	*Ephemerella subvaria*	36°22′10′′N, 80°59′30′′W	29.3 ± 1.8	40	0
Ephemeroptera	Ephemerellidae	*E. excrucians*	40°39′30′′N, 122°55′30′′W	6.6 ± 1.1	30	0
Ephemeroptera	Ephemerellidae	*Drunella grandis*	40°39′30′′N, 122°55′30′′W	157.4 ± 9.4	30	0.5
Plecoptera	Perlidae	*Claassinea sabulosa*	40°40′01′′N, 105′′13′32′′W	96.7 ± 9.4	20	1
Plecoptera	Perlidae	*Paragnetina sp.*	36°22′10′′N, 80°59′30′′W	92.9 ± 7.9	14	1
Plecoptera	Perlidae	*Doroneuria baumanni*	44°27′23′′N, 121°38′41′′W	335.6 ± 142	12	1
Plecoptera	Perlidae	*Calineuria californica*	37°17′20′′N, 122°04′20′′W	105.1 ± 10.1	20	1
Plecoptera	Perlidae	*Acroneuria abnormis*	36°22′10′′N, 80°59′30′′W	195.0 ± 23.0	16	1
Plecoptera	Perlidae	*Hesperoperla pacifica*	37°17′20′′N, 122°04′20′′W	144.3 ± 17.4	10	1
Plecoptera	Perlodidae	*Skwala sp.*	37°17′20′′N, 122°04′20′′W	78.8 ± 6.8	10	1
Plecoptera	Perlodidae	*Isogenoides hansoni*	36°22′10′′N, 80°59′30′′W	108.5 ± 13.2	6	1
Plecoptera	Perlodidae	*Baumanella alameda*	37°04′35′′N, 121°28′02′′W	34.9 ± 1.6	9	1
Plecoptera	Pteronarcydae	*Pteronarcys dorsata*	36°22′10′′N, 80°59′30′′W	139.0 ± 5.4	18	0
Trichoptera	Hydropsychidae	*H. californica*	40°23′58′′N, 122°07′44′′W	24.4 ± 1.8	40	0
Trichoptera	Hydropsychidae	*Cheumatopsyche sp.*	36°04′42′′N, 79°00′31′′W	18.9 ± 1.2	40	0
Trichoptera	Rhyacophilidae	*Rhyacophila fuscula*	36°22′10′′N, 80°59′30′′W	69.7 ± 4.3	23	1
Trichoptera	Rhyacophilidae	*Rhyacophila sp.*	37°16′07′′N, 122°18′51′′W	34.2 ± 1.9	30	1

Feeding strategies were coded as predators (1), nonpredators (0), and intermediate (0.5).

Table S2. k_e models

Model	Parameters	*d*	*P*, wt	*P*, clade	*P*, feeding	ln ML	AIC
Star	Log (wt)		0.0768			−14.6576	35.3152
PGLS	Log (wt)		0.0081			−11.1458	28.2916
OU	Log (wt)	0.7007	0.0136			−10.4368	28.8736
Star	**Log (wt) and family**		**0.0082**	**0.0004**		**5.22548**	**9.54905**
PGLS	Log (wt) and family		0.0082	0.3227		−5.1685	30.3370
OU	Log (wt) and family	7.63×10^{-9}	0.0082	0.0004		5.2254	11.5491
Star	Log (wt) and order		0.1867	0.0172		−9.6366	29.2733
PGLS	Log (wt) and order		0.0104	0.6465		−10.607	31.2139
OU	Log (wt) and order	0.7650	0.0143	0.4855		−8.47348	28.9470
Star	Log (wt) and feeding		0.5916		0.0551	−12.453	32.9059
PGLS	Log (wt) and feeding		0.0174		0.7730	−11.0959	30.1918
OU	Log (wt) and feeding	0.6654	0.0352		0.5734	−10.1292	30.2584
Star	Log (wt) family and feeding		0.0192	0.0020	0.4531	5.78766	10.4247
PGLS	Log (wt) family and feeding		0.0120	0.3155	0.4470	−4.5910	31.1820
OU	Log (wt) family and feeding	7.63×10^{-9}	0.0192	0.0020	0.4531	5.78764	12.4247
Star	Log (wt) order and feeding		0.2855	0.0933	0.5081	−9.34013	30.6803
PGLS	Log (wt) order and feeding		0.0193	0.6814	0.8835	−10.5924	33.1849
OU	Log (wt) order and feeding	0.8304	0.0236	0.5866	0.8395	−8.33224	30.6645

Best-fit model is indicated in bold.

Table S3. Subcellular Cd compartmentalization after exposure to 0.52 μg·liter^{-1}·Cd

	Fractions				
		Metal sensitive			
Taxon	Detoxified HSP	HDP	Organelles	Microsomes	Cell debris
Mccaffertium ithaca	41.3 ± 2.4	15.6 ± 1.6	5.8 ± 0.4	8.6 ± 1.2	28.8 ± 2.6
Rhithrogena morrisoni	69.4	6.8	4.1	5.0	14.7
Isonychia tusculanensis	63.3 ± 0.5	6.8 ± 2.5	5.5 ± 0.8	6.0	18.3 ± 2.2
Isonychia sp.	37.1 ± 5.4	11.3 ± 3.5	10.2 ± 2.4	14.1 ± 3.6	27.2 ± 4.4
Ephemerella subvaria	21.2 ± 0.6	27.9 ± 0.3	7.0 ± 0.9	11.1 ± 0.1	32.8 ± 0.1
Ephemerella excrucians	35.8	33.0	5.2	10.5	15.4
Drunella grandis	6.9 ± 0.9	14.2 ± 1.2	16.8 ± 0.2	20.4 ± 4.2	41.6 ± 7.8
Claassinea sabulosa	8.8 ± 3.6	15.5 ± 3.0	14.1 ± 5.4	6.7 ± 1.2	52.9 ± 4.0
Paragnetina sp.	31.8 ± 0.7	2.6 ± 0.2	6.9 ± 3.7	2.4 ± 0.4	56.2 ± 3.4
Doroneuria baumanni	7.2 ± 1.1	24.7 ± 7.1	7.6 ± 0.8	11.1 ± 0.0	48.4 ± 6.8
Calineuria californica	3.4 ± 0.7	21.9 ± 2.4	7.9 ± 1.6	11.5 ± 0.4	55.4 ± 6.7
Acroneuria abnormis	33.9 ± 1.2	2.5 ± 0.1	4.7 ± 0.6	5.8 ± 0.3	53.2 ± 1.7
Hesperoperla pacifica	7.7 ± 4.8	32.7 ± 5.6	8.8 ± 0.0	8.8 ± 1.5	41.9 ± 3.9
Skwala sp.	30.9 ± 2.8	14.7 ± 1?	7.9 ± 0.7	8.1 ± 0.1	38.4 ± 4.6
Isogenoides hansoni	10.3 ± 0.3	48.7 ± 0.3	7.2 ± 0.3	7.9 ± 0.5	25.9 ± 0.5
Baumanella alameda	29.4 ± 3.1	15.4 ± 2.8	10.2 ± 0.8	10.8 ± 4.3	34.3 ± 3.8
Pteronarcys dorsata	19.7 ± 5.1	34.3 ± 3.1	9.2 ± 1.7	7.1 ± 1.2	28.5 ± 5.4
Hydropsyche californica	25.2 ± 0.7	16.9 ± 0.5	10.8 ± 3.3	9.8 ± 0.3	37.3 ± 4.8
Cheumatopsyche sp.	21.2 ± 4.7	18.8 ± 4.7	11.5 ± 1.3	19.3 ± 2.7	29.2 ± 10.0
Rhyacophila fuscula	20.6 ± 8.4	5.6 ± 2.5	8.4 ± 0.8	4.6 ± 1.2	60.7 ± 5.4
Rhyacophila sp.	2.9	20.4	2.3	10	64.4

Table S4. k_u models

Model	Parameters	*d*	*P*, wt	*P*, clade	*P*, feeding	ln ML	AIC
Star	Log (wt)		0.4837			−15.2757	36.5515
PGLS	Log (wt)		0.6535			−16.2628	38.5255
OU	Log (wt)	0.3816	0.6099			−14.0830	36.1660
Star	**Log (wt) and family**		**0.6635**	**0.0124**		**−1.95539**	**23.9108**
PGLS	Log (wt) and family		0.8382	0.5763		−12.0801	44.1602
OU	Log (wt) and family	7.63×10^{-9}	0.6635	0.0124		−1.9554	25.9108
Star	Log (wt) and order		0.6071	0.6020		−14.6487	39.2975
PGLS	Log (wt) and order		0.6614	0.9395		−16.1857	42.3714
OU	Log (wt) and order	0.6360	0.6527	0.2615		−13.6433	39.2866
Star	Log (wt) and feeding		0.9079		0.2089	−14.3287	36.6574
PGLS	Log (wt) and feeding		0.9556		0.2783	−15.558	39.1160
OU	Log (wt) and feeding	0.3987	0.9750		0.2358	−13.1847	36.3693
Star	Log (wt) family and feeding		0.9165	0.0296	0.7889	−1.88376	25.7675
PGLS	Log (wt) family and feeding		0.9955	0.7213	0.7861	−12.0066	46.0131
OU	Log (wt) family and feeding	7.63×10^{-9}	0.9165	0.0296	0.9324	−1.88378	27.7676
Star	Log (wt) order and feeding		0.8310	0.7835	0.3308	−14.0085	40.0169
PGLS	Log (wt) order and feeding		0.9250	0.9663	0.3188	−15.5130	43.0259
OU	Log (wt) order and feeding	0.7086	0.9021	0.9385	0.3157	−12.9766	39.9532

Best-fit model is indicated in bold.

Table S5. Composite susceptibility models

Model	Parameters	*d*	*P*, wt	*P*, clade	*P*, feeding	ln ML	AIC
Star	Log (wt)		0.0440			−18.5129	43.0258
PGLS	Log (wt)		0.0210			−14.5544	35.1089
OU	Log (wt)	0.7906	0.0255			−14.1148	36.2297
Star	**Log (wt) and family**		**0.0172**	**0.0001**		**3.77389**	**12.4522**
PGLS	Log (wt) and family		0.0281	0.1233		−6.1503	32.3006
OU	Log (wt) and family	7.63×10^{-9}	0.0172	0.0001		3.77387	14.4523
Star	Log (wt) and order		0.0823	0.0125		−13.0972	36.1944
PGLS	Log (wt) and order		0.0237	0.5656		−13.8504	37.7009
OU	Log (wt) and order	0.8417	0.0261	0.4533		−11.8134	35.6268
Star	Log (wt) and feeding		0.7345		0.0030	−13.2269	34.4539
PGLS	Log (wt) and feeding		0.0808		0.0330	−11.8294	31.6589
OU	Log (wt) and feeding	0.6403	0.1247		0.0203	−10.7431	31.4863
Star	Log (wt) family and feeding		0.1183	0.0035	0.8107	3.83119	14.3376
PGLS	Log (wt) family and feeding		0.0810	0.4112	0.9429	−6.14518	34.2904
OU	Log (wt) family and feeding	7.63×10^{-9}	0.1183	0.0035	0.8107	3.83117	16.3377
Star	Log (wt) order and feeding		0.2086	0.0712	0.0263	−9.75819	31.5164
PGLS	Log (wt) order and feeding		0.0741	0.6520	0.0507	−11.2680	34.5360
OU	Log (wt) order and feeding	0.6989	0.0818	0.4583	0.0416	−8.62619	31.2524

Best-fit model indicated in bold.