

Supplementary Materials

Bioaccumulation of highly hydrophobic chemicals by

Lumbriculus variegatus.

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Section S1. Sediment Bioaccumulation Test: Overlying Water Chemistry

All parameters monitored in the overlying water of the exposure remained within ranges that would not create stress to the test organisms. Summaries of individual parameters follow.

Temperature

Oligochaetes were tested in one exposure system fitted with a temperature control system. The system had an overall mean temperature of 23.1 °C with a standard deviation of the daily means of 0.17 °C. The minimum and maximum daily means were 22.6 and 23.4 °C, respectively.

Dissolved oxygen

The overall mean dissolved oxygen was 7.4 mg/L with a standard deviation of the daily means of 0.60 mg/L and a minimum and maximum of the means of 6.32 and 8.45 mg/L, respectively. The lowest DO recorded in any test beaker at any time was 5.6 mg/L. This is well above the minimum specified by the test method.

pH

Mean overall pH was 7.20 with a standard deviation of the daily means of 0.25 and a minimum and maximum of the daily means of 6.60 and 7.69, respectively. pH values seem to drop slightly after the day 28 sediment switch for depuration samples, but they still are within acceptable limits. The lowest and highest single pH measurements were 6.60 and 7.69, respectively.

Conductivity

Conductivity of the source water typically varies between 100 and 110 µS/cm (unpublished historical data). Conductivity measurements in the overlying water of the sediments showed a total range from 99 to 154 µS/cm. The highest conductivities were recorded in Depuration samples after being refreshed with clean (fresh un-spiked) sediment.

Hardness and Alkalinity

Hardness in the source water varied from 42.0 to 52.0 mg/L as CaCO₃ with an average of 47.3 mg/L. These values were within expected limits for this test. Alkalinity varied from 38.8 to 46.0 mg/L as CaCO₃ with an average of 42.3 mg/L. These values were within expected limits for this test.

Ammonia

All ammonia measurements were less than 1 mg/L in overlying water.

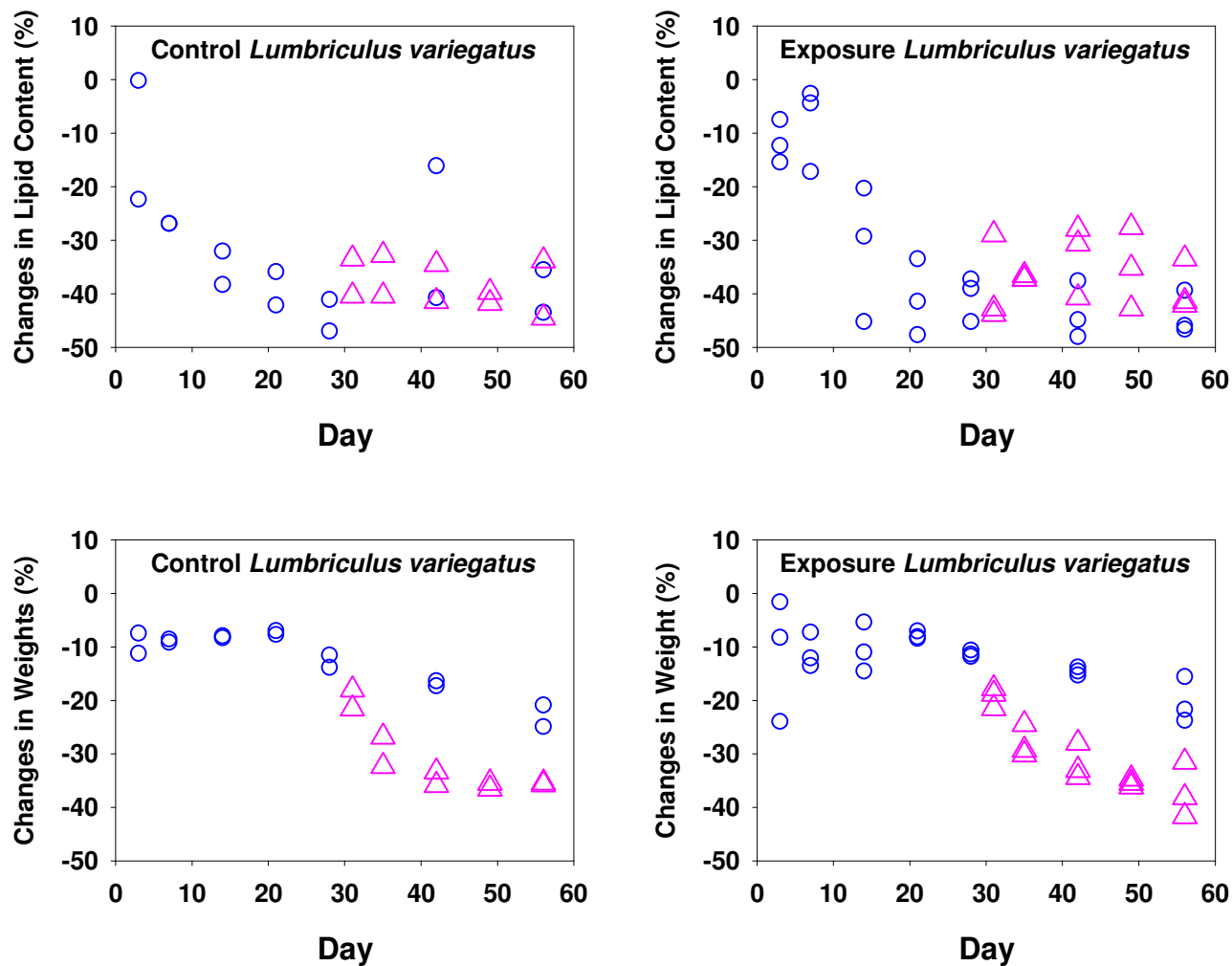


Figure S1. Changes in weight and lipid content of *Lumbricus variegatus* in the sediment bioaccumulation test for undosed (control) and dosed (exposure) sediments for the test with highly hydrophobic organic chemicals. ○ – *L. variegatus* from uptake exposure. △ – *L. variegatus* from elimination portion of the test. Elimination portion of the test started on day-28 with the transfer of the organisms from the dosed to undosed sediments.

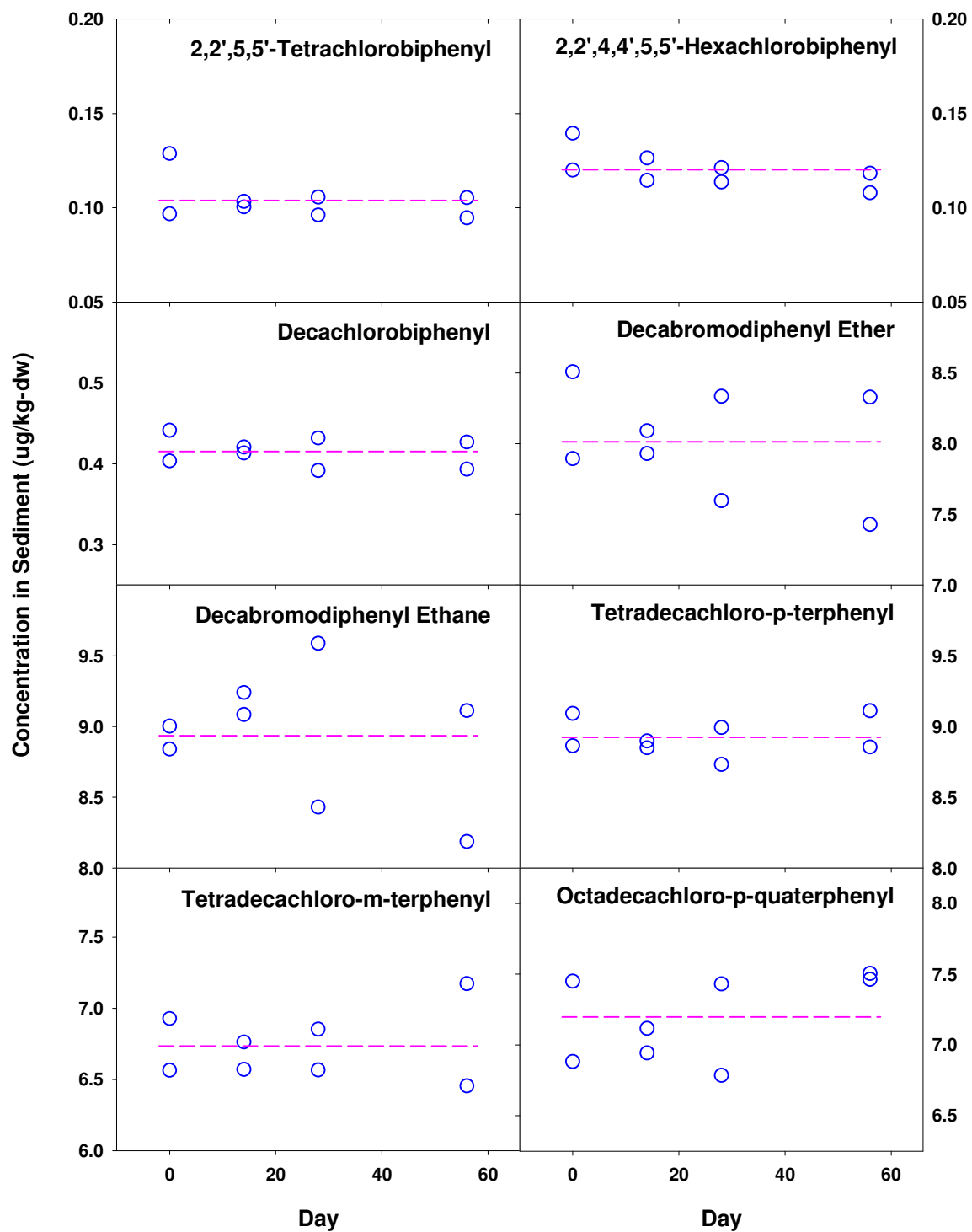


Figure S2. Concentration of highly hydrophobic chemicals in sediments over time in the sediment bioaccumulation test. The dashed line is the average of all measurements.

Table S1. Input parameters and conditions for the Arnot – Gobas AQUAWEBv1.2 model

	Lipid	NLOM	%Moisture	NLOC	Weight (g)
Sediment	0.00%	0.00%	97.00%	3.00%	
Benthic Invertebrates	2.00%	14.64%	85.36%	0.00%	5.00E-06
Temperature			15°C		
Sediment-Water Column Disequilibrium (Π_{sdcw}/K_{ow})			5		
Concentration of chemical in water column (C_w)			1	ng/L	
Concentration of chemical in sediment pore water			$= C_{sed}/(K_{OW} \times 0.35 \times f_{OC})$		ng/L
Concentration of chemical in sediment (C_{sed})			$= 5 \times K_{OW} \times C_w \times 3.0\%$		ng/kg dw
Diet for Benthic Invertebrates.			100% sediment		
Benthic Invertebrates fraction pore water (f_{pw})			5%		
Water density			1.0	kg/L	
Lipid density			0.9	kg/L	

Table S2. Biota Sediment/Soil Accumulation Factors (BSAFs) for highly hydrophobic chemicals.

Study		This Study			Li et al. 2014			Zhang et al. 2013	Tian and Zhu 2011
Organism	Log K _{ow} ^a	<i>Lumbriculus variegatus</i>			<i>Lumbriculus variegatus</i>			<i>Lumbriculus variegatus</i>	<i>Nereis succinea</i>
Compound		kinetic	day 28	day 56	kinetic	kinetic	kinetic	kinetic	kinetic
PCB-52	6.09 ^c	1.46 ± 0.15 ^b	1.42 ± 0.107	1.38 ± 0.104					
PCB-153	6.90 ^d	1.26 ± 0.393	1.28 ± 0.149	0.918 ± 0.139					
PCB-209	8.27 ^c	1.27 ± 0.334	0.569 ± 0.0451	0.863 ± 0.0459					
<i>anti</i> -Dechlorane plus	11.27				0.39 ± 0.051	0.29 ± 0.042	0.21 ± 0.041		
<i>syn</i> -Dechlorane plus	11.27				0.48 ± 0.0082	0.47 ± 0.071	0.34 ± 0.058		
BDE-206	11.22								0.017 ± 0.006
BDE-207	11.22								0.054 ± 0.0095
BDE-208	11.22								0.054 ± 0.0107
BDE-209	12.11	0.279 ± 0.176	0.0326 ± 0.00195	0.0619 ± 0.00214	0.12 ± 0.021	0.079 ± 0.013		0.103 ± 0.025	0.0193 ± 0.00628
DBDEthane	13.64	0.00456 ± 0.00181	0.00282 ± 0.000871	0.00405 ± 0.000874	0.018 ± 0.003	0.016 ± 0.002		0.0210 ± 0.0026	
<i>p</i> -TCP	14.23	0.0148 ± 0.00465	0.00531 ± 0.0012	0.00758 ± 0.0012					
<i>m</i> -TCP	14.23	0.0240 ± 0.00863	0.00794 ± 0.00204	0.0107 ± 0.00204					
<i>p</i> -QTCP	18.29	0.0221 ± 0.00986	0.00207 ± 0.000335	0.00341 ± 0.000335					

a – Estimated using EPISuite (US-EPA 2012). b – Average ± standard deviation. c – Literature value reported by EPISuite. d – Woodburn et al. (Woodburn et al. 1984)

Table S2 Continued. Biota Sediment/Soil Accumulation Factors (BSAFs) for highly hydrophobic chemicals.

Study		Zhang et al 2015	Klosterhaus et al 2011	Klosterhaus and Baker 2010			Tian et al. 2012
Organism		<i>Eisenia fetida</i>	<i>Nereis virens</i>	<i>Nereis virens</i>			<i>Tubifex tubifex</i>
Compound	Log K _{ow} ^a	Residues came to steady-state	day 28	PCB 209 Spiked day 28	Ether Spiked day 28	Mixed Spiked day 28	day 80
PCB-52	6.09 ^c						
PCB-153	6.90 ^d						
PCB-209	8.27 ^c		0.0024 ± 0.0001	0.0154 ± 0.00678		0.00299 ± 0.00038	
<i>anti</i> -Dechlorane plus	11.27						
<i>syn</i> -Dechlorane plus	11.27						
BDE-206	11.22				0.00899 ± 0.00108		0.02
BDE-207	11.22		0.0012 ± 0.0003		0.0308 ± 0.0047	0.00106 ± 0.00018	0.05
BDE-208	11.22				0.0895 ± 0.0186		0.04
BDE-209	12.11	0.123 0.084 0.074	0.0003 ± 0.00008		0.00969 ± 0.00108	0.000317 ± 0.0000084	0.01
DBDEthane	13.64						
<i>p</i> -TCP	14.23						
<i>m</i> -TCP	14.23						
<i>p</i> -QTCP	18.29						

a – Estimated using EPISuite (US-EPA 2012). b – Average ± standard deviation. c – Literature value reported by EPISuite. d – Woodburn et al. (Woodburn et al. 1984)

Table S3. Weight and lipid contents of *Lumbriculus variegatus* for the 56-day sediment bioaccumulation test

Day	<i>Lumbriculus variegatus</i> initial mass	<i>Lumbriculus variegatus</i> mass upon collection	Weight Change (%)	Average Weight Change (%)	lipid content (%)	Average Lipid Content (%)	Average Lipid Content Change (%)
Initial Organisms							
0	0.206, 0.2019				2.79, 2.98	2.88 (±0.13)	
Control uptake							
3	0.209, 0.1960	0.1856, 0.1814	11.2, 7.4	9.3 (±2.6)	2.24, 2.88	2.56 (±0.45)	11.3
7	0.1995, 0.2061	0.1825, 0.1873	8.5, 9.1	8.8 (±0.4)	2.11, 2.11	2.11 (±0)	26.9
14	0.1956, 0.2000	0.1794, 0.1841	8.3, 8.0	8.1 (±0.2)	1.78, 1.96	1.87 (±0.13)	35.2
21	0.1985, 0.2016	0.1847, 0.1861	7.0, 7.7	7.3 (±0.5)	1.67, 1.85	1.76 (±0.13)	39.0
28	0.2018, 0.1981	0.1739, 0.1753	13.8, 11.5	12.7 (±1.6)	1.53, 1.70	1.62 (±0.12)	44.0
42	0.197, 0.2014	0.1629, 0.1684	17.3, 16.4	16.8 (±0.7)	1.71, 2.42	2.06 (±0.5)	28.4
56	0.1954, 0.2082	0.1546, 0.1563	20.9, 24.9	22.9 (±2.9)	1.86, 1.63	1.74 (±0.16)	39.5
Control uptake 28 day, depuration							
3	0.2031, 0.1921	0.1665, 0.1507	18.0, 21.6	19.8 (±2.5)	1.72, 1.92	1.82 (±0.14)	36.9
7	0.1987, 0.2078	0.1454, 0.1406	26.8, 32.3	29.6 (±3.9)	1.72, 1.94	1.83 (±0.16)	36.6
14	0.1999, 0.2044	0.1282, 0.1362	35.9, 33.4	34.6 (±1.8)	1.69, 1.89	1.79 (±0.14)	38.0
21	0.2077, 0.2046	0.1317, 0.1321	36.6, 35.4	36 (±0.8)	1.74, 1.68	1.71 (±0.04)	40.7
28	0.2069, 0.2010	0.1329, 0.1298	35.8, 35.4	35.6 (±0.2)	1.60, 1.91	1.76 (±0.22)	39.2
Uptake							
3	0.1944, 0.1958, 0.1984	0.1478, 0.1797, 0.1953	24.0, 8.2, 1.6	11.3 (±11.5)	2.44, 2.53, 2.67	2.55 (±0.12)	11.7
7	0.2006, 0.1972, 0.1990	0.1735, 0.1734, 0.1846	13.5, 12.1, 7.2	10.9 (±3.3)	2.39, 2.76, 2.81	2.65 (±0.23)	8.0
14	0.2051, 0.1994, 0.2016	0.1753, 0.1887, 0.1795	14.5, 5.4, 11.0	10.3 (±4.6)	1.58, 2.30, 2.04	1.97 (±0.36)	31.6
21	0.1993, 0.2041, 0.2011	0.1832, 0.1870, 0.1870	8.1, 8.4, 7.0	7.8 (±0.7)	1.51, 1.92, 1.69	1.71 (±0.21)	40.8
28	0.2056, 0.1943, 0.2058	0.1823, 0.1737, 0.1816	11.3, 10.6, 11.8	11.2 (±0.6)	1.81, 1.76, 1.58	1.72 (±0.12)	40.5
42	0.1996, 0.2023, 0.2045	0.1691, 0.1745, 0.1747	15.3, 13.7, 14.6	14.5 (±0.8)	1.50, 1.59, 1.80	1.63 (±0.15)	43.5
56	0.2064, 0.2008, 0.1950	0.1616, 0.1531, 0.1646	21.7, 23.8, 15.6	20.4 (±4.2)	1.54, 1.75, 1.56	1.62 (±0.12)	44.0

Uptake 28, Depuration

3	0.2009, 0.2047, 0.2103	0.1630, 0.1607, 0.1729	18.9, 21.5, 17.8	19.4 (± 1.9)	1.72, 1.92	1.82 (± 0.14)	36.9
7	0.1961, 0.2016, 0.1999	0.1386, 0.1522, 0.1397	29.3, 24.5, 30.1	28.0 (± 3.0)	1.72, 1.94	1.83 (± 0.16)	36.6
14	0.1992, 0.2001, 0.2100	0.1334, 0.1441, 0.1378	33.0, 28.0, 34.4	31.8 (± 3.4)	1.69, 1.89	1.79 (± 0.14)	38.0
21	0.2061, 0.2053, 0.2003	0.1347, 0.1325, 0.1279	34.6, 35.5, 36.1	35.4 (± 0.8)	1.74, 1.68	1.71 (± 0.04)	40.7
28	0.1984, 0.1972, 0.2088	0.1157, 0.1350, 0.1291	41.7, 31.5, 38.2	37.1 (± 5.2)	1.60, 1.91	1.76 (± 0.22)	39.2

Table S4. Concentration of chemicals in sediment (ug/kg-dw)

Day	2,2',4,4',5,5'-				Decachlorobiphenyl		Decabromodiphenyl Ether	
	2,2',5,5'-Tetrachlorobiphenyl		Hexachlorobiphenyl					
0	0.129		0.139		0.441		8.51	
0	0.097	0.113	0.120	0.130	0.404	0.422	7.89	8.20
14	0.103		0.126		0.421		7.93	
14	0.100	0.102	0.114	0.120	0.413	0.417	8.09	8.01
28	0.096		0.114		0.432		8.33	
28	0.106	0.101	0.121	0.117	0.392	0.412	7.60	7.97
56	0.095		0.108		0.427		8.33	
56	0.105	0.100	0.118	0.113	0.393	0.410	7.43	7.88
Average	0.104		0.120		0.415		8.01	
Standard deviation	0.0059		0.0070		0.0056		0.216	
Coefficient of variation	5.7%		5.8%		1.3%		2.7%	
Day	Decabromodiphenyl Ethane		Tetradecachloro- <i>p</i> -terphenyl		Tetradecachloro- <i>m</i> -terphenyl		Octadecachloro- <i>p</i> - quaterphenyl	
0	9.00		9.09		6.93		7.45	
0	8.84	8.92	8.86	8.98	6.56	6.75	6.88	7.17
14	9.24		8.85		6.57		6.94	
14	9.08	9.16	8.90	8.87	6.76	6.67	7.12	7.03
28	9.59		8.99		6.57		7.43	
28	8.43	9.01	8.73	8.86	6.85	6.71	6.78	7.11
56	9.11		9.11		7.17		7.50	
56	8.19	8.65	8.85	8.98	6.45	6.81	7.46	7.48
Average	8.94		8.92		6.73		7.20	
Standard deviation	0.249		0.065		0.113		0.207	
Coefficient of variation	2.8%		0.7%		1.7%		2.9%	

Table S5. Concentrations of highly hydrophobic chemicals in *Lumbriculus variegatus*
2,2,5,5'-Tetrachlorobiphenyl

Uptake Exposure				Elimination Exposure			
Day	<i>C_{L. variegatus}</i>			Day	<i>C_{L. variegatus}</i>		
	(µg/kg ww)	(µg/kg lipid)	% Lipid		(µg/kg ww)	(µg/kg lipid)	% Lipid
0	0.513 (0.00288)	17.2 (0.0967)	2.98%	31	2.1 (0.0423)	128 (2.57)	1.65%
3	52.4 (0.00415)	2070 (0.164)	2.53%	31	2.06 (0.00657)	100 (0.321)	2.05%
3	55.4 (0.00941)	2070 (0.352)	2.67%	31	2.15 (0.00911)	133 (0.564)	1.62%
7	68.3 (0.0219)	2470 (0.793)	2.76%	42	1.18 (0.0243)	59 (1.22)	2.00%
7	65.8 (0.00675)	2340 (0.24)	2.81%	42	1.13 (0.0103)	54.1 (0.493)	2.08%
7	65.5 (0.00468)	2740 (0.196)	2.39%	42	1.34 (0.013)	78.1 (0.761)	1.71%
14	55 (0.00846)	3470 (0.535)	1.58%	49	1.76 (1.46)	107 (88.9)	1.65%
14	52.3 (0.00384)	2570 (0.189)	2.04%	49	1.21 (0.0267)	58 (1.28)	2.09%
21	34.6 (0.0082)	1800 (0.428)	1.92%	56	0.964 (0.00898)	57.6 (0.537)	1.67%
21	29.5 (0.00544)	1740 (0.322)	1.69%	56	0.953 (0.0275)	56.2 (1.62)	1.69%
28	25.4 (0.00926)	1610 (0.588)	1.58%				
28	27.1 (0.00619)	1540 (0.352)	1.76%				
28	26.6 (0.0185)	1470 (1.02)	1.81%				
42	23.7 (0.00969)	1580 (0.646)	1.50%				
42	26.6 (0.0314)	1470 (1.74)	1.80%				
56	22.9 (0.00378)	1490 (0.245)	1.54%				

2,2,4,4',5,5'-Hexachlorobiphenyl

Uptake Exposure				Elimination Exposure			
Day	<i>C_{L. variegatus}</i>			Day	<i>C_{L. variegatus}</i>		
	(µg/kg ww)	(µg/kg lipid)	% Lipid		(µg/kg ww)	(µg/kg lipid)	% Lipid
0	1.33 (0.00431)	44.5 (0.144)	2.98%	31	5.35 (0.00603)	325 (0.366)	1.65%
3	27 (0.00314)	1070 (0.124)	2.53%	31	6.17 (0.00356)	301 (0.174)	2.05%
3	35 (0.0201)	1310 (0.754)	2.67%	31	5.33 (0.00529)	330 (0.328)	1.62%
7	51 (0.00246)	1840 (0.0888)	2.76%	42	0.714 (0.00547)	35.7 (0.274)	2.00%
7	49.8 (0.00409)	1770 (0.146)	2.81%	42	1.01 (0.0125)	48.7 (0.599)	2.08%
7	37.6 (0.00199)	1570 (0.0831)	2.39%	42	0.97 (0.0015)	56.7 (0.088)	1.71%
14	45.1 (0.0589)	2850 (3.72)	1.58%	49	1.13 (0.0231)	68.5 (1.4)	1.65%
14	56.6 (0.00339)	2780 (0.166)	2.04%	49	0.918 (0.00502)	43.9 (0.24)	2.09%
21	39.8 (0.0022)	2080 (0.115)	1.92%	56	0.993 (0.00726)	59.3 (0.434)	1.67%
21	32.8 (0.00429)	1940 (0.254)	1.69%	56	0.733 (0.00444)	43.3 (0.262)	1.69%
28	27.6 (0.00195)	1750 (0.124)	1.58%				
28	28.3 (0.011)	1610 (0.627)	1.76%				
28	25.9 (0.0116)	1430 (0.641)	1.81%				
42	18.6 (0.00428)	1240 (0.286)	1.50%				
42	26.1 (0.0186)	1440 (1.03)	1.80%				
56	17.7 (0.00217)	1150 (0.141)	1.54%				

Table S5. Concentrations of highly hydrophobic chemicals in *Lumbriculus variegatus*

Decachlorobiphenyl

Uptake Exposure				Elimination Exposure			
Day	<i>C_{L. variegatus}</i>			Day	<i>C_{L. variegatus}</i>		
	(µg/kg ww)	(µg/kg lipid)	% Lipid		(µg/kg ww)	(µg/kg lipid)	% Lipid
0	0.0624 (0.00106)	2.09 (0.0354)	2.98%	31	17.8 (0.00103)	1080 (0.0625)	1.65%
3	11.1 (0.000718)	438 (0.0284)	2.53%	31	17.7 (0.001)	865 (0.0488)	2.05%
3	10.4 (0.00096)	388 (0.0359)	2.67%	31	16.6 (0.00156)	1030 (0.0963)	1.62%
7	16.2 (0.00168)	585 (0.0606)	2.76%	42	14.4 (0.000951)	721 (0.0476)	2.00%
7	16.2 (0.00145)	576 (0.0516)	2.81%	42	14.1 (0.00303)	676 (0.145)	2.08%
7	15.7 (0.07)	656 (2.93)	2.39%	42	13.6 (0.00101)	797 (0.0591)	1.71%
14	29.4 (0.000992)	1860 (0.0627)	1.58%	49	10.3 (0.00149)	623 (0.0907)	1.65%
14	23.8 (0.000999)	1170 (0.049)	2.04%	49	10.3 (0.00111)	495 (0.0529)	2.09%
21	33.3 (0.00247)	1740 (0.129)	1.92%	56	8.16 (0.000883)	487 (0.0528)	1.67%
21	32.9 (0.000903)	1950 (0.0534)	1.69%	56	7.02 (0.0544)	414 (3.21)	1.69%
28	41.6 (0.00105)	2640 (0.0664)	1.58%				
28	43.6 (0.000371)	2480 (0.021)	1.76%				
28	40.9 (0.00146)	2260 (0.0806)	1.81%				
42	53.2 (0.000879)	3550 (0.0586)	1.50%				
42	52.1 (0.00419)	2890 (0.232)	1.80%				
56	57.4 (0.0632)	3730 (4.11)	1.54%				

Tetradecachloro-p-terphenyl

Uptake Exposure				Elimination Exposure			
Day	<i>C_{L. variegatus}</i>			Day	<i>C_{L. variegatus}</i>		
	(µg/kg ww)	(µg/kg lipid)	% Lipid		(µg/kg ww)	(µg/kg lipid)	% Lipid
0	ND (0.0105)	ND (0.35)	2.98%	31	0.39 (0.00774)	23.7 (0.471)	1.65%
3	3.97 (0.011)	157 (0.437)	2.53%	31	0.383 (0.00462)	18.7 (0.225)	2.05%
3	0.901 (0.0057)	33.7 (0.213)	2.67%	31	0.42 (0.0117)	26 (0.723)	1.62%
7	4.6 (0.0388)	166 (1.4)	2.76%	42	0.322 (0.000553)	16.1 (0.0277)	2.00%
7	4.54 (0.00735)	162 (0.262)	2.81%	42	0.338 (0.00834)	16.2 (0.4)	2.08%
7	5.25 (0.00513)	220 (0.215)	2.39%	42	0.427 (0.00441)	25 (0.258)	1.71%
14	4.52 (0.00749)	285 (0.473)	1.58%	49	0.33 (0.00204)	20 (0.124)	1.65%
14	5.52 (0.0108)	271 (0.53)	2.04%	49	0.226 (0.00803)	10.8 (0.384)	2.09%
21	9.94 (0.0087)	518 (0.454)	1.92%	56	0.245 (0.00568)	14.6 (0.339)	1.67%
21	8.75 (0.00428)	518 (0.253)	1.69%	56	0.221 (0.00529)	13 (0.312)	1.69%
28	9.77 (0.012)	620 (0.761)	1.58%				
28	7.87 (0.0156)	447 (0.884)	1.76%				
28	7.47 (0.011)	412 (0.607)	1.81%				
42	8.36 (0.0026)	557 (0.173)	1.50%				
42	13.1 (0.0513)	728 (2.84)	1.80%				
56	10.8 (0.00886)	704 (0.576)	1.54%				

Table S5. Concentrations of highly hydrophobic chemicals in *Lumbriculus variegatus*

Tetradecachloro-m-terphenyl

Uptake Exposure				Elimination Exposure			
Day	<i>C_{L. variegatus}</i>			Day	<i>C_{L. variegatus}</i>		
	(µg/kg ww)	(µg/kg lipid)	% Lipid		(µg/kg ww)	(µg/kg lipid)	% Lipid
0	0.0287 (0.0113)	0.963 (0.38)	2.98%	31	0.591 (0.00661)	35.9 (0.402)	1.65%
3	3.83 (0.00864)	151 (0.342)	2.53%	31	0.563 (0.0039)	27.5 (0.19)	2.05%
3	1.16 (0.00496)	43.5 (0.186)	2.67%	31	0.56 (0.01)	34.6 (0.621)	1.62%
7	4.78 (0.0179)	173 (0.649)	2.76%	42	0.492 (0.000419)	24.6 (0.021)	2.00%
7	4.94 (0.00564)	176 (0.201)	2.81%	42	0.464 (0.00618)	22.3 (0.297)	2.08%
7	5.14 (0.00222)	215 (0.093)	2.39%	42	0.569 (0.00377)	33.3 (0.22)	1.71%
14	5.23 (0.0059)	330 (0.372)	1.58%	49	0.486 (0.00152)	29.5 (0.0923)	1.65%
14	5.46 (0.00855)	268 (0.42)	2.04%	49	0.334 (0.00654)	16 (0.313)	2.09%
21	10.1 (0.00291)	529 (0.152)	1.92%	56	0.342 (0.0046)	20.5 (0.275)	1.67%
21	9.94 (0.00357)	588 (0.211)	1.69%	56	0.324 (0.00279)	19.1 (0.165)	1.69%
28	11.3 (0.0104)	716 (0.657)	1.58%				
28	8.58 (0.012)	488 (0.679)	1.76%				
28	8.35 (0.00825)	461 (0.455)	1.81%				
42	9.6 (0.00208)	640 (0.139)	1.50%				
42	12.5 (0.0394)	693 (2.18)	1.80%				
56	11.5 (0.00651)	749 (0.423)	1.54%				

Decabromodiphenyl ether

Uptake Exposure				Elimination Exposure			
Day	<i>C_{L. variegatus}</i>			Day	<i>C_{L. variegatus}</i>		
	(µg/kg ww)	(µg/kg lipid)	% Lipid		(µg/kg ww)	(µg/kg lipid)	% Lipid
0	ND (0.0451)	ND (1.51)	2.98%	31	10.6 (0.0817)	645 (4.96)	1.65%
3	10.7 (0.0252)	423 (0.998)	2.53%	31	9.83 (0.0706)	480 (3.44)	2.05%
3	8.46 (0.0526)	317 (1.97)	2.67%	31	9.76 (0.0195)	604 (1.21)	1.62%
7	16.6 (0.195)	600 (7.04)	2.76%	42	9.94 (0.00139)	498 (0.0695)	2.00%
7	16.4 (0.114)	584 (4.08)	2.81%	42	8.99 (0.124)	431 (5.97)	2.08%
7	17.8 (0.0315)	747 (1.32)	2.39%	42	11.5 (0.0137)	675 (0.799)	1.71%
14	28.8 (0.0267)	1820 (1.69)	1.58%	49	8.25 (0.0097)	501 (0.589)	1.65%
14	24.1 (0.0446)	1180 (2.19)	2.04%	49	7.68 (0.0728)	368 (3.49)	2.09%
21	36.4 (0.0375)	1900 (1.96)	1.92%	56	7.74 (0.00831)	462 (0.497)	1.67%
21	35.5 (0.0362)	2100 (2.14)	1.69%	56	7.69 (0.0199)	454 (1.17)	1.69%
28	44.4 (0.0515)	2820 (3.27)	1.58%				
28	49.3 (0.105)	2800 (5.97)	1.76%				
28	46.1 (0.0566)	2540 (3.12)	1.81%				
42	61.5 (0.0207)	4100 (1.38)	1.50%				
42	62.8 (0.163)	3480 (9.03)	1.80%				
56	78.5 (0.0012)	5100 (0.0776)	1.54%				

Table S5. Concentrations of highly hydrophobic chemicals in *Lumbriculus variegatus*
Decabromodiphenyl ethane

Uptake Exposure				Elimination Exposure			
<i>C. variegatus</i>				<i>C. variegatus</i>			
Day	(µg/kg ww)	(µg/kg lipid)	% Lipid	Day	(µg/kg ww)	(µg/kg lipid)	% Lipid
0	ND (0.162)	ND (5.41)	2.98%	31	0.317 (0.161)	19.3 (9.81)	1.65%
3	3 (0.0514)	119 (2.03)	2.53%	31	ND (0.148)	ND (7.25)	2.05%
3	0.782 (0.145)	29.3 (5.42)	2.67%	31	ND (0.179)	ND (11.1)	1.62%
7	2.87 (0.11)	104 (3.98)	2.76%	42	ND (0.0591)	ND (2.96)	2.00%
7	2.53 (0.465)	90 (16.6)	2.81%	42	ND (0.175)	ND (8.4)	2.08%
7	4.82 (0.059)	202 (2.47)	2.39%	42	ND (0.0546)	ND (3.19)	1.71%
14	2.34 (0.0476)	148 (3.01)	1.58%	49	ND (0.0121)	ND (0.733)	1.65%
14	3.24 (0.0785)	159 (3.85)	2.04%	49	ND (0.261)	ND (12.5)	2.09%
21	5.16 (0.267)	269 (13.9)	1.92%	56	ND (0.0575)	ND (3.44)	1.67%
21	5.57 (0.072)	330 (4.26)	1.69%	56	ND (0.0539)	ND (3.18)	1.69%
28	5.4 (0.238)	343 (15.1)	1.58%				
28	3.76 (0.134)	214 (7.6)	1.76%				
28	4.24 (0.173)	234 (9.54)	1.81%				
42	4.92 (0.0341)	328 (2.27)	1.50%				
42	8.05 (0.495)	446 (27.4)	1.80%				
56	5.81 (0.0894)	378 (5.81)	1.54%				

Octadecachloro-p-quaterphenyl

Uptake Exposure				Elimination Exposure			
<i>C. variegatus</i>				<i>C. variegatus</i>			
Day	(µg/kg ww)	(µg/kg lipid)	% Lipid	Day	(µg/kg ww)	(µg/kg lipid)	% Lipid
0	0.0319 (0.0319)	0.356 (0.356)	8.95%	31	0.191 (0.119)	11.6 (7.25)	1.65%
3	4.3 (0.108)	170 (4.25)	2.53%	31	0.175 (0.112)	8.56 (5.46)	2.05%
3	0.908 (0.0991)	34 (3.71)	2.67%	31	0.204 (0.118)	12.6 (7.29)	1.62%
7	5.1 (0.111)	184 (4.03)	2.76%	42	0.134 (0.144)	6.71 (7.19)	2.00%
7	5.79 (0.105)	206 (3.72)	2.81%	42	ND (0.139)	ND (6.66)	2.08%
7	5.31 (0.111)	222 (4.66)	2.39%	42	0.216 (0.135)	12.6 (7.88)	1.71%
14	5.78 (0.11)	365 (6.96)	1.58%	49	ND (0.15)	ND (9.1)	1.65%
14	3.59 (0.108)	176 (5.28)	2.04%	49	ND (0.146)	ND (6.98)	2.09%
21	7.76 (0.103)	405 (5.39)	1.92%	56	ND (0.147)	ND (8.81)	1.67%
21	9.14 (0.103)	541 (6.11)	1.69%	56	ND (0.14)	ND (8.29)	1.69%
28	9.55 (0.106)	606 (6.75)	1.58%				
28	5.55 (0.111)	315 (6.32)	1.76%				
28	8.37 (0.106)	461 (5.84)	1.81%				
42	8.83 (0.114)	589 (7.62)	1.50%				
42	15 (0.111)	829 (6.13)	1.80%				
56	10 (0.12)	653 (7.77)	1.54%				

^a ND – Not Detected. Amount (Minimum Detection Level) or ND (MDL).