

Table S1. Defecation rates for the three reviewed species in unpolluted, reference, control, or non-toxic conditions.

Species	Temp (°C)	Defecation rate (mg mg ⁻¹ dw d ⁻¹)	Worm weight (dw)	Standardized Defecation rate (mg mg ⁻¹ dw d ⁻¹)	TOC%	SC%	Reference	Observations	
<i>T. tubifex</i>	18-23	62.8	3.8	22.3	4.7	74.2	Appleby and Brinkhurst 1970	Estimated using the inverted method	
		63.2	3.1	26.7	4.7	74.2			
		5.7	0.6	8.8	2.1	71	Reible et al. 1996		
		9.4	1.6	6.6	1.6	88.8	Martinez-Madrid et al. 1999		Data were transformed by applying a mean fecal density of 4.05 mg/mm ³ (from data reported in Rodriguez et al., 2001). Data for controls and non-toxic sites were from 28-day, chronic exposures.
		15.0	1.6	10.5	2.2	89.8			
		15.4	1.6	10.6	2.8	90.8			
		10.9	1.4	8.4	3.4	91.8			
		8.5	1.4	6.5	3.9	92.8			
		8.0	1.3	6.5	4.5	93.8			
		13.9	1.5	10.3	5.1	94.8			
		10.4	1.7	7.1	1.2	31.0			
		7.9	2.3	4.1	6.1	92.1			
		18.2	2.2	10.0	1.8	26.5			
	5.1	1.4	3.9	4.6	87.0				
	8.3	1.8	5.3	1.7	33.9				
	4.6	2.1	2.6	1.7	15.5				
	12-14	22.5	3.8	8.1	4.7	74.2	Appleby and Brinkhurst 1970	Estimated using the inverted method	
		23.2	3.0	9.9	4.7	74.2			
		50.7	3.8	18.0	4.7	74.2			
		48.6	3.3	19.3	4.7	74.2			
21.0		1.3	17.5	4.7	74.2				
10.5	21.5	1.7	14.2	4.7	74.2		Under hypoxia (0.5 mg O ₂ l ⁻¹)		
	20.3	0.4*	41.1	5.2	53	Volpers and Neumman 2005			
	19.8	0.4*	40.1	5.2	53				
	12.5	0.4*	25.3	5.2	53				
	13.5	0.4*	27.4	5.2	53				
	24.8	0.4*	50.3	5.2	53				
	25.3	0.4*	51.3	5.2	53				
<i>L.hoffmeisteri</i>	18-23	30.9	3.1	13.0	4.7	74.2	Appleby and Brinkhurst, 1970	Estimated using the inverted method	
		58.0	3.1	24.5	4.7	74.2			
		9.8	0.6	14.6	-	-	Kaster et al. 1984	Estimated using the inverted method	

		16.5	0.6	23.5	-	-		Estimated using the upright method
		5.1	0.5	9.0	-	-	Klump et al. 1987	Mean values after 151-189h
		6.0	0.5	10.5	-	-		Mean values after 189-235h
		6.2	0.7	8.3	2.5	-	Lotufo and Fleger 1996	From bioassay controls
		10.5	0.5	17.2	-	-		
		14.7	0.7	19.5	-	-		From bioassay solvent control
		24.2	0.6	36.7	-	-		
		17.3	0.6	27.1	-	-		After a 24h recovery period, fecal pellets collected daily for 3 days
		9.9	0.4	20.9	-	-		
		37.2	0.4	80.0	-	-		After 5-day egestion experiments
		39.2	0.4	76.5	-	-		
		29.2	0.5	52.3	-	-		
		24.3	0.6	38.5	-	-		
		27.9	0.6	43.6	-	-		
		22.4	0.6	31.9	-	-		
		21.9	0.6	31.2	-	-		
		30.2	0.7	42.1	-	-		
		28.7	0.8	33.4	-	-		
		21.2	1.0	20.9	-	-		
		2.3	0.6	3.5	2.1	71	Reible et al. 1996	
12-14		9.6	2.7	4.4	4.7	74.2	Appleby and Brinkhurst 1970	Estimated using the inverted method
		8.8	4.1	3.0	4.7	74.2		
		11.0	3.9	3.9	4.7	74.2		
		13.2	3.6	5.0	4.7	74.2		
		7.3	6.6	1.7	4.7	74.2		
		9.7	4.6	3.0	4.7	74.2		
10.5		9.3	0.4*	18.8	5.2	53	Volpers and Neumman 2005	Under hypoxia (0.5 mg O ₂ l ⁻¹)
		17.8	0.4*	36.1	5.2	53		
		8.0	0.4*	16.2	5.2	53		
		2.3	0.4*	4.7	5.2	53		
		4.5	0.4*	9.1	5.2	53		
		12.5	0.4*	25.3	5.2	53		
<i>L. variegatus</i>	18-23	2.0	0.4	4.0	0.5	-	Kukkonen and Landrum 1994	
		4.0	0.4	7.8	-	-		
		11.3	0.5	18.8	0.4	-	Kukkonen and Landrum 1995	
		22.1	0.5	38.8	0.4	-		

14.4	0.42*	28.1	-	-	Leppänen and Kukkonen 1998a	Approximate values from Fig.7
20.4	0.5	34.8	-	-	Leppänen and Kukkonen 1998b	Approximate values from Fig.2
11.3	0.9	12.2	-	-		
4.6	0.4	9.2	-	-		
10.6	0.9	11.5	-	-		
0.4	0.6*	0.6	0.3	-	Landrum et al. 2004	Approximate values from Fig.1
1.8	0.4	3.4	7	90	Penttinen et al. 2008	Approximate values from Fig.2a

* Assuming 90% water content

Table S2. Defecation rates for the three reviewed species in polluted or contaminated conditions.

Species	Temp (°C)	Defecation rate (mg mg ⁻¹ dw d ⁻¹)	Worm weight (dw)	Standardized Defecation rate (mg mg ⁻¹ dw d ⁻¹)	TOC%	SC%	Reference	Observations
<i>T. tubifex</i>	18-23	2.1	1.2	1.8	2.9	82.7	Martinez-Madrid et al. 1999	Data were transformed by applying a mean faecal density of 4.05 mg/mm ³ (from data reported in Rodriguez et al., 2001). Data for toxic sites were from 28-day sediment exposures.
		2.9	1.3	2.4	6.7	54.8		
		7.9	0.7	10.4	8.0	56.6		
		2.1	1.1	2.0	2.8	39.0	Reible et al. 1996	Pyrene exposure (90 µg g ⁻¹)
		3.7	0.6	5.7	2.1	71.0		
<i>L. hoffmeisteri</i>	18-23	2.3	0.6	0.5	2.1	71.0	Reible et al. 1996	Pyrene exposure (90 µg g ⁻¹)
		0.4	0.5	1.7	-	-	Lotufo and Fleger 1996	Pyrene exposure (98-841 µg g ⁻¹)
		2.3	0.5	1.7	-	-		
<i>L. variegatus</i>	18-23	0.3	0.6*	0.5	0.3		Lamdrum et al. 2004	Approximate values from Fig 1. Mean at 192 and 238h for 20-30 µg PCB g ⁻¹ exposure
		0.9	0.4	1.8	7.0	90.0	Penttinen et al. 2008	10-d average egestion rate at 7-30 µg Cd g ⁻¹ dw
		3.0	0.4	5.9	7.0	90.0		10-d average egestion rate at 60-140 µg Cr g ⁻¹ dw
		4.2	0.4	8.2	7.0	90.0		10-d average egestion rate at 80-245 µg Cu g ⁻¹ dw
		1.1	0.4	2.1	7.0	90.0		10-d average egestion rate at 30-150 µg Pb g ⁻¹ dw

* Assuming 90% water content

Table S3. Assimilation efficiencies (AE%) for the reviewed species, calculated using the Conover method (see text for the equation).

Species	AE%	Reference	Observations	
<i>T. tubifex</i>	14.6	Brinkhurst et al. 1972*	250 µm sediment fraction	
	9.6		120 µm sediment fraction	
	9.6		63 µm sediment fraction	
	14.6		At 5°C	
	7.6		At 10°C	
	8.7		At 15°C	
	7.1		At 20°C	
	4.9		Brinkhurst and Austin 1979	At 20°C
	3.4			At 20°C
	3.6		Rodriguez et al. 2001	At 22.5°C, 63 µm sediment fraction
	8.6			At 22.5°C, 63 µm sediment fraction
	19.6			At 22.5°C, 63 µm sediment fraction
	<i>L.hoffmeisteri</i>		14.6	Brinkhurst et al. 1972*
10.8		120 µm sediment fraction		
7.6		63 µm sediment fraction		
14.6		At 5°C		
7.0		At 10°C		
12.2		At 15°C		
9.5		At 20°C		
9.3		Brinkhurst and Austin 1979	At 20°C	
6.4			At 20°C	

*No significant differences were obtained for each fraction and temperature combination, thus all values were used for the estimation of AE%

Table S4. Assimilation efficiencies (AE%) for the three reviewed species calculated using the dual-tracer method (see text for the equation). In observations there is information on the time period after which the AE% was measured, and in some cases the sediment size fraction that was used.

Species	AE%	Reference	Observations
<i>L.hoffmeisteri</i>	36.4	Klump et al. 1987 ^a	0-22.5h
	33.2		22.5-47h
	25.8		47-92h
	19.8		92-151h
	14.9		151-189h
	16.1		189-235h
	7.4		235-356h, mean value in the text
	15.9		235-356h, 63-20 µm sediment size fraction
	6.7		235-356h, 20-5 µm sediment size fraction
	10.5		235-356h, 5-2 µm sediment size fraction
	2.7		235-356h, 2-0.2 µm sediment size fraction
<i>L. variegatus</i>	22.9	Kukkonen and Landrum 1995 ^b	At 12h
	25.6		At 24h
	10.9		At 36h
	13.0		At 48h
	11.7		At 60h
	12.9		At 72h
	13.0		At 96h
	12.9		At 120h

^a Dual-tracer method using ¹⁴C-PCB (assimilated) and trivalent ⁵¹Cr (non-assimilated).

^b Dual-tracer method using ³H-BaP(assimilated) and ¹⁴C-PDMS (non-assimilated), sediment sieved using 1-mm mesh

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