

Size matters at deep-sea hydrothermal vents: different diversity and habitat fidelity patterns of meio- and macrofauna

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Supplement

Table S1. Macrofaunal species abundance per 10 cm² is shown for each sample from the Pompeii worm habitat (P1 – P5) and the basalt habitat (B1 – B4). For each species the taxon is given (AN = Annelida, AR = Arthropoda, CH = Chordata, MO = Mollusca). **Bold** numbers indicate abundance > 1 individual per 10 cm²

Species	Taxon	P1	P2	P3	P4	P5	B1	B2	B3	B4
<i>Alvinella caudata</i>	AN	1.06	0.35	3.37	2.54	1.21				
<i>Alvinella pompejana</i>	AN	3.1	1.31	2.48	6.76	3.03				
<i>Amphisamytha galapagensis</i>	AN	0.09	0.06				0.53	0.68		0.05
<i>Archinome rosacea</i>	AN						0.2	0.27		
<i>Branchinotogluma</i> sp. 1	AN									0.22
<i>Flabelliderma</i> sp. 1	AN						0.02		0.04	0.03
<i>Galapagomystides aristata</i>	AN									0.05
<i>Glycera tessellata</i>	AN							0.15		
<i>Hesiolyra bergi</i>	AN	0.97	0.61	0.89	3.38	0.61				
<i>Hesiospina vestimentifera</i>	AN									0.05
Juvenile polychaete	AN									0.03
Juvenile polynoid polychaete	AN							0.04		
<i>Lepidonotopodium williamse</i>	AN									0.03
Nectochaeta larvae	AN			0.18						
<i>Nereis sandersi</i>	AN						0.13	0.11		
<i>Nicomache arwidsoni</i>	AN							0.11		
<i>Ophryotrocha akessoni</i>	AN	0.18	0.12	0.18		0.61	0.02			0.73
<i>Paralvinella grasslei</i>	AN	0.35	0.41	0.35	2.54					0.05
Syllidae sp. 1	AN						0.02			
Amphipod sp. 4	AR						0.02	0.04		
<i>Bythograea thermydron</i>	AR		0.06							
<i>Dahlella caldariensis</i>	AR									0.22
<i>Typhlotanais</i> sp.1	AR						0.02			0.22
<i>Ventiella sulfuris</i>	AR	1.06	2.13	0.18		2.42	0.07			6.88
Tunicate	CH								0.04	
<i>Gorgoleptis spiralis</i>	MO									0.03
Juvenile gastropod	MO						0.15	0.19		
Juvenile limpet	MO						0.11	0.23		0.11
<i>Lepetodrilus ovalis</i>	MO									0.11
<i>Lepetodrilus cristatus</i>	MO									0.03
<i>Lepetodrilus elevatus</i>	MO		0.03	0.35					0.19	0.81
<i>Lepetodrilus galriffensis</i>	MO		0.03	0.18						
<i>Rhynchopelta concentrica</i>	MO								0.04	0.16

Table S2. Total abundance, species richness and species abundance of meiofauna and macrofauna from vent-distant samples collected ~1 km away from the AST axis at the 9°N EPR. Meiofauna and macrofauna (meio, macro) species are given according to higher taxa (AN = Annelida, AR = Arthropoda, CH = Chordata, MO = Mollusca, COP = Copepoda, NEMA = Nematoda, OSTR = Ostracoda) for vent-distant sample B1 (v-d B1), and vent-distant samples S1 (v-d S1) and S2 (v-d S2). Shared species with the AST at vents and bare basalt are indicated by x. x* species were not included in Gollner et al. (2010; PLoS ONE 5(8): e12321, doi:10.1371/journal.pone.0012321) (benthopelagic species), but were observed by S. Gollner. Calanoida, Corycaeidae, Oncaeidae are here counted as 1 species each. In brackets: shared species including yet unpublished information from samples collected by S. Gollner and M. Bright in the AST after 2006 (unpublished shared species in the AST include *Barathricola rimensis*, *Ectinosoma* sp. 3, *Sarsameira* sp. 2, *Tisbe* sp. nov. 1, *Tisbe* sp. 2, Nematoda sp. 2)

	Taxon	Size	v-d B1	v-d S1	v-d S2	AST vent	AST basalt
Abundance		Macro	53	0	6		
		Meio	101	20	55		
Species richness		Macro	9	0	5		
		Meio	13	8	32		
Species							
<i>Ophryotrocha akessoni</i>	AN	Macro	1	0	0	x	x
Polychaeta off-axis sp. 1	AN	Macro	0	0	1		
Polynoid off-axis sp. 1	AN	Macro	1	0	0		
Amphipoda off-axis sp. 1	AR	Macro	1	0	0		
Amphipoda off-axis sp. 2 (juv)	AR	Macro	1	0	0		
Amphipoda off-axis sp. 3 (juv)	AR	Macro	1	0	0		
Cumacea	AR	Macro	0	0	2		
Isopoda off-axis sp. 1 (juv)	AR	Macro	0	0	1		
Isopoda off-axis sp. 2	AR	Macro	1	0	0		
Isopoda off-axis sp. 3	AR	Macro	0	0	1		
Isopoda off-axis sp. 4 (juv)	AR	Macro	0	0	1		
Tunicate (?)	CH	Macro	5	0	0		
Appendicularia	CH	Macro	41	0	0	x*	x*
Gastropoda off-axis sp. 1	MO	Macro	1	0	0		
<i>Ameira</i> sp. nov. 1	COP	Meio	1	0	2	x	x
<i>Amphiascus</i> sp. 1 (aff. varians)	COP	Meio	0	0	3	x	x
<i>Aphotopontius acanthinus</i>	COP	Meio	13	0	1	x	
<i>Argestes angolaensis</i> (?)	COP	Meio	0	0	1		
<i>Barathricola rimensis</i>	COP	Meio	0	1	1	(x)	(x)
<i>Ectinosoma</i> sp. 3	COP	Meio	0	0	1	(x)	
<i>Idyella</i> sp. 1	COP	Meio	0	0	2		
<i>Idyella</i> sp. 2	COP	Meio	0	0	1		
<i>Keraia</i> juvenile	COP	Meio	0	0	1		
<i>Marsteinia</i> sp. 1	COP	Meio	0	0	1		
<i>Marsteinia</i> sp. 2	COP	Meio	0	0	1		
<i>Mesocletodes</i> sp. nov. 2	COP	Meio	0	1	0		
<i>Misophrioida</i> sp. 1	COP	Meio	0	0	1		
<i>Neobradia</i> sp. 1	COP	Meio	0	0	1		
Paranannopidae juvenile	COP	Meio	0	0	1		
<i>Pontostratiotes</i> sp. 1	COP	Meio	0	1	0		
<i>Pontostratiotes</i> sp. 2	COP	Meio	1	0	0		
Pseudotachiidae sp. 1	COP	Meio	1	0	0		
<i>Sapphirina</i> sp. nov. 3	COP	Meio	1	0	0		
<i>Sarsameira</i> sp. 2	COP	Meio	0	0	2		(x)
Siphonostomatoida sp. 1	COP	Meio	0	0	1		
Siphonostomatoida sp. 2	COP	Meio	0	0	1		
Siphonostomatoida sp. 3	COP	Meio	0	0	1		
<i>Stygiopontius hispidulus</i>	COP	Meio	2	3	1	x	x
<i>Tachidiopsis</i> sp. 1	COP	Meio	0	0	1		
<i>Tisbe</i> sp. 2	COP	Meio	1	0	0	(x)	(x)

<i>Tisbe</i> sp. nov. 1	COP	Meio	2	5	13	(x)	(x)
Calanoida	COP	Meio	32	5	2	x*	x*
Corycaeidae	COP	Meio	10	0	0	x*	x*
<i>Microsetella norwegica</i>	COP	Meio	2	0	0	x*	x*
Oncaeidae	COP	Meio	34	2	2	x*	x*
<i>Chromadorita</i> (?) sp. 1	NEMA	Meio	0	0	1	x	x
COK (<i>Chromadorida</i> ?) sp. 2	NEMA	Meio	0	0	1		
Epsilonematidae sp. 1	NEMA	Meio	0	0	2		
Epsilonematidae sp. 2	NEMA	Meio	0	0	2		
<i>Microlaimus cyatholaimoides</i>	NEMA	Meio	0	0	1		
Nematoda sp. 2	NEMA	Meio	0	0	2	(x)	
Nematoda sp. 3	NEMA	Meio	0	0	1		
<i>Oncholaimus</i> sp. 1	NEMA	Meio	1	0	0		
<i>Paracyatholaimus</i> sp. 4	NEMA	Meio	0	0	1		
<i>Thalassomonhystera fisheri</i>	NEMA	Meio	0	2	0	x	x
<i>Xylocythere vanharteni</i>	OSTRA	Meio	0	0	2	x	x

Table S3. Results of bootstrapping (bt, 10000 resamplings each) used to test for significant differences in abundance per 10 cm², observed species richness (S_{obs}), species richness after identifying 300 individuals (S_{m300}), species richness at a sample coverage of 98% ($S_{Cm0.98}$) and Shannon diversity (H'_{loge}) between the habitats P (Pompeii worm), T (tubeworm), M (mussel), and B (basalt) for (A) meiofauna and (B) macrofauna. (C) Bootstrapping results for meiofauna versus macrofauna in the four habitat types (P, T, M, B) tested for abundance per 10 cm², S_{obs} , S_{m300} , $S_{Cm0.98}$ and H'_{loge} . Higher (>) and lower (<) values of meiofauna (me) and macrofauna (ma) indices are indicated for each habitat. Significant results after classical Bonferroni-correction are marked in **bold**. In brackets: results of non-parametric Kruskal-Wallis tests

(A) Meiofauna

Habitat	Abund. 10 cm ⁻²	S_{obs}	S_{m300}	$S_{Cm0.98}$	H'_{loge}
P - T	0.29 (0.35)	< 0.001 (0.45)	< 0.001 (0.53)	< 0.001 (0.53)	< 0.001 (0.09)
T - M	0.81 (1)	< 0.001 (0.59)	< 0.001 (0.73)	< 0.001 (1)	< 0.001 (1)
M - B	0.003 (0.49)	0.58 (1)	0.21 (1)	< 0.001 (1)	0.07 (1)
P - M	< 0.001 (1)	< 0.001 (0.01)	< 0.001 (0.02)	< 0.001 (0.06)	< 0.001 (0.04)
P - B	< 0.001 (0.12)	< 0.001 (< 0.01)	< 0.001 (0.002)	< 0.001 (< 0.001)	< 0.001 (0.17)
T - B	0.32 (1)	< 0.001 (0.53)	< 0.001 (0.25)	< 0.001 (0.12)	0.2 (1)

(B) Macrofauna

Habitat	Abund. 10 cm ⁻²	S_{obs}	S_{m300}	$S_{Cm0.98}$	H'_{loge}
P - T	< 0.001 (< 0.01)	< 0.001 (< 0.01)	< 0.001 (0.03)	< 0.001 (0.07)	< 0.001 (0.06)
T - M	< 0.001 (0.68)	< 0.001 (0.62)	0.28 (1)	0.95 (1)	0.06 (0.89)
M - B	< 0.001 (0.24)	0.002 (0.99)	0.84 (1)	0.76 (1)	0.52 (1)
P - M	< 0.001 (0.50)	< 0.001 (0.14)	< 0.001 (0.19)	0.006 (0.41)	0.13 (1)
P - B	0.51 (1)	0.09 (1)	0.003 (0.6)	0.024 (0.56)	0.29 (1)
T - B	< 0.001 (< 0.01)	< 0.001 (0.03)	0.41 (1)	0.66 (1)	0.005 (0.38)

(C) Meiofauna-Macrofauna

Habitat	Abund. 10 cm ⁻²	H'_{loge}	
P	< 0.001 (< 0.01)	me >	< 0.001 (< 0.01)
T	0.21 (0.08)		0.06 (< 0.01)
M	< 0.001 (0.04)	me >	< 0.001 (0.02)
B	0.08 (0.25)		0.06 (0.02)

Habitat	S_{obs}	S_{m300}	$S_{Cm0.98}$
P	0.47 (0.67)	0.85 (0.92)	0.07 (0.17)
T	< 0.001 (0.01)	0.71 (0.63)	0.51 (0.63)
M	< 0.001 (0.02)	< 0.001 (0.02)	me>
B	< 0.001 (0.02)	< 0.001 (0.02)	me>

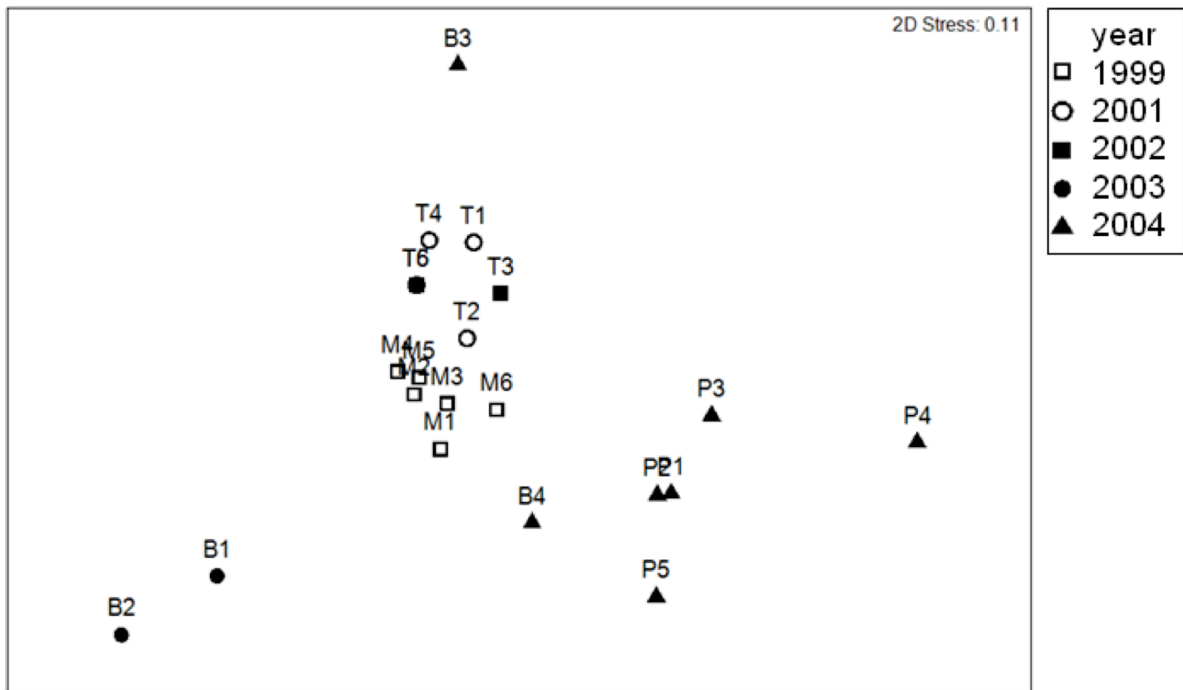


Figure S1. Two-dimensional MDS configuration plot (data standardized, square-root transformed; similarity based on Bray-Curtis similarity) of macrofauna data from Pompeii worm (P1-P5), tubeworm (T1-T6), mussel (M1-M6) and basalt habitats (B1-B4). Symbols indicate the year of sampling