

Spatial patterns of tissue stable isotope contents give insight into the nutritional sources for seep communities on the Gulf of Mexico lower slope

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Supplement. Additional summary data and statistical analysis

Table S1. Stable isotope data for all taxa in this study collected with seep mussels, clams, and vestimentiferans. The number outside of the parentheses is the average isotope value of all individuals. The first number in the parentheses is the number of samples, and the second number is the standard deviation. Where there was only one sample, the parentheses are omitted. All species are *a priori* non-symbiotic except *Oligobrachia* sp., which is in the Family Siboglinidae and is known to have chemoautotrophic symbionts

Taxon	$\delta^{13}\text{C}$		$\delta^{15}\text{N}$		$\delta^{34}\text{S}$	
Cnidaria						
Actinaria gen. spp.	-39.0	(33, 9.9)	3.1	(33, 3.4)	7.6	(24, 5.7)
Hydrozoa gen. spp.	-42.3	(15, 6.8)	4.2	(15, 0.6)	7.8	(11, 5.0)
Stolonifera gen. spp.	-44.8	(20, 5.0)	3.7	(20, 1.3)	11.1	(17, 3.0)
Zoanthidae gen. sp.	-44.4	(3, 1.2)	6.1	(3, 0.3)	3.1	(3, 0.8)
Ciliophora (Protozoa)						
folliculinid ciliate (pooled)	-25.7		-1.9			
Nematoda						
Nematoda gen. spp. (pooled)	-61.9	(2, 0.1)	0.4	(2, 0.1)		
Nemertea						
Nemertea gen. sp.	-45.0	(4, 8.8)	2.7	(4, 2.7)	-2.4	(3, 5.8)
Sipunculida						
<i>Phascolosoma turnerae</i> Rice, 1985	-44.8	(21, 11.0)	5.8	(21, 3.3)	3.8	(21, 7.9)
Annelida						
Polychaeta						
<i>Branchinotogluma</i> sp.	-50.5	(23, 9.6)	1.8	(23, 3.2)	7.4	(17, 8.4)
<i>Branchipolynoe seepensis</i> Pettibone, 1986	-53.2	(5, 7.4)	-1.4	(5, 1.1)	7.0	(5, 6.5)
Cirratulidae gen. sp.	-63.3	(3, 0.6)	0.2	(3, 0.4)	4.2	(3, 5.4)
<i>Eurythoe</i> sp.	-67.9	(13, 6.0)	1.4	(13, 1.1)	7.1	(13, 3.6)
Flabelligeridae gen. sp.	-48.4	(18, 10.4)	-0.4	(18, 2.8)	7.0	(13, 2.3)
<i>Glycera tessellata</i> Grube, 1863	-45.8	(2, 4.4)	6.3	(2, 2.3)	0.6	(2, 1.6)
<i>Glycera</i> sp.	-39.3	(4, 15.6)	5.3	(4, 1.9)	0.0	(3, 1.6)
<i>Harmothoe</i> sp.	-49.9	(29, 9.7)	4.4	(29, 2.7)	4.2	(21, 4.3)
<i>Hesiocaeca methanicola</i> Desbruyères & Toulmond 1998	-47.6	(15, 10.2)	0.9	(15, 3.1)	9.6	(5, 7.2)
<i>Heteromastides</i> sp.	-37.9	(15, 7.5)	8.1	(15, 1.6)	2.5	(13, 2.9)

<i>Lumbrinereis</i> sp.	-52.5	(4, 11.4)	5.3	(4, 1.8)	3.8	(2, 7.3)
<i>Methanoaricia dendrobranchiata</i> Blake, 2000	-54.9	(6, 5.2)	4.2	(6, 1.7)	5.5	(4, 4.5)
Nautiliniellidae gen. sp.	-55.5	(22, 9.6)	0.4	(22, 1.9)	3.1	(16, 7.1)
<i>Nicomache</i> sp.	-53.1	(10, 13.6)	1.8	(10, 0.8)	0.2	(7, 2.8)
<i>Notomastus</i> sp.	-80.3		3.4		8.9	
Phyllodocidae gen. sp.	-42.7	(11, 10.9)	7.7	(11, 1.0)	2.3	(6, 3.7)
<i>Prionospio</i> sp.	-42.9	(7, 11.5)	-0.6	(7, 2.4)	-0.2	(2, 11.2)
<i>Protomystides</i> sp.	-42.3	(40, 12.3)	7.2	(40, 2.1)	2.6	(29, 7.9)
Siboglinidae						
<i>Oligobrachia</i> sp.	-51.6	(3, 3.9)	2.6	(3, 0.2)		
Mollusca						
Polyplacophora						
<i>Ischnochiton</i> sp.	-50.8		3.5		9.1	
Gastropoda						
<i>Buccinum</i> sp.	-33.8		1.1		-6.9	
<i>Cataegis meroglypta</i> McLean, 1987	-52.7		1.2		12.6	
<i>Fucaria</i> sp.	-52.6	(3, 1.3)	1.8	(3, 1.8)	-1.7	(2, 0.1)
<i>Paraleptopsis</i> sp.	-44.4	(3, 7.9)	3.0	(3, 2.1)	6.4	
<i>Phymorrynchus</i> sp.	-41.3	(3, 2.9)	2.5	(3, 1.2)	6.9	(2, 2.5)
<i>Provanna schupta</i> Warén & Ponder, 1991	-46.4	(5, 5.7)	3.0	(5, 1.0)	7.0	(5, 2.6)
<i>Pyropelta</i> sp.	-49.4		-1.3		12.2	
Bivalvia						
<i>Cuspidaria</i> sp.	-39.3	(5, 3.8)	4.0	(9, 1.6)	-1.8	(4, 10.0)
Arthropoda						
Crustacea						
<i>Alvinocaris muricola</i> Williams, 1988	-46.7	(80, 9.5)	1.4	(80, 2.6)	5.2	(71, 8.6)
Amphipoda gen. spp.	-45.2	(6, 14.0)	2.7	(14, 2.8)	7.0	(4, 9.0)
<i>Chaceon</i> sp.	-29.4		6.9		2.4	
Isopoda gen. sp.	-36.2	(3, 5.7)	4.4	(3, 0.8)	5.9	
<i>Munidopsis</i> spp.	-33.5	(7, 8.2)	7.0	(7, 1.6)	5.3	(7, 8.2)
<i>Munidopsis</i> sp. 1	-48.0	(2, 4.1)	6.1	(2, 0.4)	8.5	(2, 1.0)
Unidentified Brachyuran	-53.5		4.2		9.4	
Echinodermata						
Asteroidea						
Unidentified sea star	-32.3	(3, 1.2)	6.4	(3, 1.5)	12.3	(3, 6.2)
<i>Ophiectenella acies</i> Tyler et al., 1995	-44.4	(28, 7.1)	0.7	(28, 2.2)	6.6	(23, 9.4)
<i>Ophienigma spinilimbatum</i> Stöhr & Seganzac, 2005	-37.0	(23, 10.7)	3.2	(23, 2.1)	9.5	(12, 6.5)
Holothuroidea						
<i>Chiridota heheva</i> Pawson & Vance, 2004	-43.7	(29, 9.5)	2.3	(29, 2.1)	12.3	(27, 4.8)

Table S2. p-values for pairwise Mann-Whitney tests of isotope values of associated fauna between foundation fauna types. All p-values were significant given a sequential Bonferroni corrected α

$\delta^{13}\text{C}$	Mussel	Vestimentiferan
Clam	<0.001	0.001
Mussel		<0.001
$\delta^{15}\text{N}$		
Clam	<0.001	<0.001
Mussel		<0.001
$\delta^{34}\text{S}$		
Clam	<0.001	0.007
Mussel		<0.001

Table S3. General linear models (GLMs) to determine the factors that affect isotope values of different subsets of the animals collected in this study. The response variables consist of all the individual isotope data for the animal group listed in the first column of the table, and the predictor variables or factors are listed in the second column

Fauna type	Factor	df	<i>F</i> -statistic	p-value
$\delta^{13}\text{C}$				
Vestimentiferans and mussels	Foundation fauna	1	118.92	<0.001
	Collection	32	12.07	<0.001
Associated heterotrophic fauna	Foundation fauna	1	13.06	<0.001
	Collection	32	24.80	<0.001
Vestimentiferans only	Collection	12	29.88	<0.001
Vestimentiferan associates	Collection	12	16.84	<0.001
Mussels only	Collection	19	7.50	<0.001
Mussel associates	Collection	19	30.19	<0.001
$\delta^{15}\text{N}$				
Vestimentiferans and mussels	Foundation fauna	1	241.34	<0.001
	Collection	32	2.58	<0.001
Associated heterotrophic fauna	Foundation fauna	1	227.29	<0.001
	Collection	32	8.23	<0.001
Vestimentiferans only	Collection	12	3.34	0.001
Vestimentiferan associates	Collection	12	2.63	0.003
Mussels only	Collection	19	2.47	0.003
Mussel associates	Collection	19	14.59	<0.001
$\delta^{34}\text{S}$				
Vestimentiferans and mussels	Foundation fauna	1	602.19	<0.001
	Collection	32	10.12	<0.001
Associated heterotrophic fauna	Foundation fauna	1	24.91	<0.001
	Collection	32	11.65	<0.001
Vestimentiferans only	Collection	10	9.32	<0.001
Vestimentiferan associates	Collection	10	7.58	<0.001
Mussels only	Collection	19	14.78	<0.001
Mussel associates	Collection	19	17.74	<0.001

Table S4. Paired *t*-tests for differences between mean isotope values of associates and foundation fauna. For this analysis, each pair consisted of the mean of all associates within a collection and the mean of all foundation fauna (vestimentiferans or mussels) within the same collection

Foundation fauna	N	Mean diff.	<i>t</i> -statistic vs. mean not = 0	p-value
$\delta^{13}\text{C}$				
Vestimentiferan	11	1.8	1.03	0.165
Mussel	20	11.8	14.30	<0.001
$\delta^{15}\text{N}$				
Vestimentiferan	11	2.0	4.56	<0.001
Mussel	20	4.6	11.17	<0.001
$\delta^{34}\text{S}$				
Vestimentiferan	11	12.7	9.18	<0.001
Mussel (Wilcoxon)	20	Median = -4.16	<i>W</i> = 0.0	<0.001