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Interactive comment on "Biodiversity and trophic ecology of hydrothermal vent fauna associated with tubeworm assemblages on the Juan de Fuca Ridge" *by* Yann Lelièvre et al.

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We are grateful to Dr. Boschen for her constructive suggestions that helped us improve our manuscript significantly.

Please find attached our response to Rachel Boschen's comments.

Please also note the supplement to this comment:
https://www.biogeosciences-discuss.net/bg-2017-411/bg-2017-411-AC1-supplement.pdf

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Interactive comment on Biogeosciences Discuss., https://doi.org/10.5194/bg-2017-411, 2017.

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Table 1. Trophic guild and nutritional modes of macrofaunal species associated with the *Ridgeia piscesae* tubeworm assemblages of the Grotto hydrothermal edifice (Main Endeavour Field, Juan de Fuca Ridge). An asterisk (*) marks the original description of the species.

Species	Trophic guil - Nutritional mode	Reference(s)
Annelida		
Polychaeta		
Siboglinidae		
Ridgeia piscesae	Symbiotic	Jones,1985*; Southward et al., 1995; Bergquist et al., 2007; This study
Maldanidae		
Nicomache venticola	Bacterivore - Surface deposit feeder or grazer	Blake and Hilbig, 1990*; Bergquist et al., 2007; This study
Dorvilleidae		
Ophryotrocha globopalpata	Predator	Blake and Hilbig, 1990*; Bergquist et al., 2007; This study
Orbiniidae		
Berkeleyia sp. nov.	Scavenger/detritivore - Suspension feeder	Jumars et al., 2015; This study
Hesionidae		
Hesiospina sp. nov.[1]	Predator	Bonifácio et al., *in preparation**; This study
Phyllodocidae		
Protomystides verenae	Predator	Blake and Hilbig, 1990*; Bergquist et al., 2007; This study
Polynoidae		
Branchinotogluma tunnicliffeae	Predator	Pettibone, 1988*; Bergquist et al., 2007; This study
Branchinotogluma sp.	Predator	-
Lepidonotopodium piscesae	Predator	Pettibone, 1988*; Levesque et al., 2006; Bergquist et al., 2007; This study
Levensteinia kincaidi	Predator	Pettibone, 1985*; Bergquist et al., 2007; This study
Sigalionidae		
Pholoe courtneyae	Predator	Blake, 1995*; Sweetman et al., 2013
Syllidae		
Sphaerosyllis ridgensis	Predator	Blake and Hilbig, 1990*; Bergquist et al., 2007; This study
Ampharetidae		
Paraiphimedia dela	Bacterivore - Surface deposit feeder or grazer; suspension feeder	Detinova et al., 1988*; This study
Paraivinella palmiformis	Bacterivore - Surface deposit feeder or grazer; suspension feeder	Desbruyères and Laubier, 1986*; Desbruyères and Laubier, 1991; Levesque et al., 2003; This study
Paraivinella pandorae	Bacterivore - Surface deposit feeder or grazer; suspension feeder	Desbruyères and Laubier, 1986*; Desbruyères and Laubier, 1991; Levesque et al., 2003; This study
Paraivinella sufficula	Bacterivore - Surface deposit feeder or grazer; suspension feeder	Tunnicliffe et al., 1993*; Levesque et al., 2003; This study
Ampharetidae		
Amphisamytha carlaboni	Scavenger/detritivore - Surface deposit feeder or grazer	Stiller et al., 2013*; McHugh and Tunnicliffe, 1994; Bergquist et al., 2007; This study
Cirratulidae		
Raricirrus sp.	Bacterivore - Surface deposit feeder or grazer	Jumars et al., 2015
Spionidae		
Prionospio sp.	Bacterivore - Surface deposit feeder or grazer	Jumars et al., 2015
Mollusca		
Aplacophora		
Simrothiellidae		
Helicoradomenia juani	Predator	Scheltema and Kuzirian, 1991*; Bergquist et al., 2007; This study
Gastropoda		
Buccinidae		
Buccinum thermophilum	Scavenger/detritivore - Surface deposit feeder or grazer	Hanasewych and Kantor, 2002*; Martell et al., 2002; This study
Provannidae		
Provanna variabilis	Bacterivore - Surface deposit feeder or grazer	Warén and Bouchet, 1986*; Bergquist et al., 2007; This study
Peltospiridae		
Depressigyra globulus	Bacterivore - Surface deposit feeder or grazer	Warén and Bouchet, 1989*; Bergquist et al., 2007; This study
Clypeosectidae		
Clypeosectus curvus	Predator	McLean, 1989*; Bergquist et al., 2007; This study
Lepetodrilidae		
Lepetodrilus fucensis	Symbiotic; Bacterivore - Surface deposit feeder or grazer; suspension feeder	McLean, 1988*; Fox et al., 2002; Bates et al., 2007; Bergquist et al., 2007; This study
Arthropoda		
Arachnida		
Halacaridae		
Copidognathus papillatus	Predator	Krantz, 1982*; Bergquist et al., 2007; This study
Amphipoda		
Alicellidae		
Paralicella cf. vaporalis	-	Barnard and Ingram, 1990*
Calliopiidae		
Orodarea cf. walkeri	-	Shoemaker, 1930*
Leipomphopus sp.	-	-
Cnatacea		
Philomedidae		
Euphilomedes climax	Bacterivore - Surface deposit feeder or grazer	Kornicker, 1991*; This study
Cytheruridae		
Xylocythere sp. nov.[2]	Bacterivore - Surface deposit feeder or grazer	Tanaka et al., *in preparation**; Maddocks and Steinceck, 1987; This study
Pycnogonida		
Ammotheidae		
Sericosura verenae	Bacterivore - Surface deposit feeder or grazer	Child, 1987*; Bergquist et al., 2007; This study
Sericosura venticola	Bacterivore - Surface deposit feeder or grazer	Child, 1987*; Bergquist et al., 2007; This study
Sericosura cf. dissita	Bacterivore - Surface deposit feeder or grazer	Child, 2000*; This study
Nemertea		
Unidentified	Predator	-
Echinodermata		
Ophiuroidae	-	-

[1]This species refers to *Hesiospina legendrei* that is currently under description (Bonifácio et al., *in preparation*)
[2]This species refers to *Xylocythere sarrazinae* that is currently under description (Tanaka et al., *in preparation*)

Fig. 1. Table 1 - Trophic guild and nutritional mode

Table 2. Percentage abundance x 100 (% Ab.), faunal density (D. ind m^{-2}), volume (V. ind m^{-2}) and relative biomass x 100 (% Biom.) of the different macrofaunal taxa (>250 µm) identified in the 6 sampling units (S1 to S6) on the Grotto edifice. The taxa were identified to the lowest possible taxonomical level.

Species	S1 - Assemblage V low-flow				S2 - Assemblage V low-flow				S3 - Assemblage V low-flow				S4 - Assemblage IV				S5 - Assemblage V low-flow				S6 - Assemblage III			
	% Ab.	D. (ind m^{-2})	V. (ind m^{-2})	% Biom.	% Ab.	D. (ind m^{-2})	V. (ind m^{-2})	% Biom.	% Ab.	D. (ind m^{-2})	V. (ind m^{-2})	% Biom.	% Ab.	D. (ind m^{-2})	V. (ind m^{-2})	% Biom.	% Ab.	D. (ind m^{-2})	V. (ind m^{-2})	% Biom.	% Ab.	D. (ind m^{-2})	V. (ind m^{-2})	% Biom.
Annelida																								
Polychaeta																								
Maldanidae																								
Nicomache venticola Donvillestae	0.1	8	1604.5	0.2	0.1	14.1	7033.6	0.1	0.2	35.5	6363.3	1.1	0	0	0	0	0	0	0	0	0	0	0	0
Ophyrotrocha globopalpata Orbiniidae	0.1	4.2	849.5	< 0.1	0.1	9.8	4893	< 0.1	1.3	202	36241.1	< 0.1	< 0.1	1.8	934.6	< 0.1	< 0.1	10	1851.9	< 0.1	0	0	0	0
Berkeleyia sp. nov. Hesionidae	0	0	0	0	0	0	0	0	< 0.1	6.3	1137.8	< 0.1	0	0	0	0	0	0	0	0	0	0	0	0
Hmisingina sp. nov. Phyllodocidae	0.1	9.8	1982.1	< 0.1	0.1	10.4	5198.8	< 0.1	0.1	14.3	2570.6	< 0.1	0	0	0	0	0	0	0	0	0	0	0	0
Protomystides verrenae Polynoidae	< 0.1	0.5	94.4	< 0.1	< 0.1	0.6	305.8	< 0.1	< 0.1	0.2	42.1	< 0.1	0	0	0	0	0	0	0	0	0	0	0	0
Branchinotogluma tunnicliffeae	< 0.1	0.7	141.6	< 0.1	0.1	9.2	4587.2	< 0.1	< 0.1	2.6	463.6	< 0.1	0.2	47.4	25233.7	0.2	< 0.1	20	3703.7	< 0.1	0.3	16.4	400	< 0.1
Branchinotogluma sp.	0	0	0	0	0	0	0	0	0	0	0	0	< 0.1	1.8	934.6	< 0.1	0	0	0	0	0	0	0	0
Lepidonotopodium piscesae	0	0	0	0	< 0.1	1.2	611.6	< 0.1	< 0.1	3.8	674.3	< 0.1	0.2	43.9	23364.5	0.9	0.1	50.1	9259.3	0.2	0.2	10.9	2666.7	0.1
Levensteiniella kincaidi	0.1	8.2	1651.7	0.1	0.1	10.4	5198.8	< 0.1	< 0.1	4	716.4	< 0.1	< 0.1	3.5	1869.2	< 0.1	< 0.1	20	3703.7	< 0.1	0	0	0	0
Sigalionidae																								
Pholoe courtneyae Syllidae	< 0.1	0.2	47.2	< 0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sphaerosyllis ridgensis	3.6	257.6	51911.3	< 0.1	1	170.2	85015.3	< 0.1	1.7	262.6	47113.4	< 0.1	0	0	0	0	0.1	90.1	16666.7	< 0.1	0.1	5.5	133.3	< 0.1
Alvinellidae																								
Paralvinella delta	0	0	0	0	0	0	0	0	< 0.1	0.7	126.4	< 0.1	0	0	0	0	0	0	0	0	0	0	0	0
Paralvinella palmiformis	0	0	0	0	0.1	10.4	5198.8	< 0.1	0.1	10.3	1854.2	0.1	3.3	726.4	186915.9	6.8	0.2	130.2	20370.4	0.8	0.7	43.6	1066.7	1.4
Paralvinella pandorae	< 0.1	0.7	141.6	< 0.1	< 0.1	2.5	1223.2	< 0.1	0.1	17.4	3118.4	< 0.1	0.1	17.6	9345.8	< 0.1	0.1	70.1	12963	< 0.1	5.4	354.3	8666.7	< 0.1
Paralvinella sulfincola	0	0	0	0	0	0	0	0	< 0.1	6.6	1179.9	0.1	0.6	122.8	65420.6	0.5	< 0.1	10	1851.9	< 0.1	0.2	10.9	266.7	0.1
Ampharetidae																								
Amphisamytha carlbarvi Cirratulidae	26.8	1932.1	389334.6	0.5	24.5	3367.5	1681651.4	0.5	34.8	5378.8	964938.9	1.8	0.4	80.7	42990.7	< 0.1	5.1	3004.6	555555.6	0.2	7.4	479.6	11733.3	0.1
Raricirrus sp.	< 0.1	0.2	47.2	< 0.1	0	0	0	0	< 0.1	1.9	337.1	< 0.1	0	0	0	0	0	0	0	0	0	0	0	0
Spionidae																								
Prionospio sp.	< 0.1	2.1	424.7	< 0.1	0	0	0	0	< 0.1	0.9	168.6	< 0.1	0	0	0	0	0	0	0	0	0	0	0	0
Mollusca																								
Aplacophora																								
Simrothiellidae																								
Helicoradomenia juani	3.7	263.7	53138.3	< 0.1	3.4	461.1	230275.2	< 0.1	5.6	861.9	154614.4	0.14	0.1	17.6	9345.8	< 0.1	1.3	791.2	146296.3	< 0.1	2	130.8	3200	< 0.1
Gastropoda																								
Buccinidae																								
Buccinum thermophilum Provannidae	0.1	9.8	1982.1	3.2	0.1	18.4	9174.3	1.6	< 0.1	2.4	421.4	0.4	0	0	0	0	0.1	50.1	9259.3	5.8	0	0	0	0
Provanna variabilis Peltospiridae	1.9	137	27607.4	2.2	1.6	224.8	112232.4	1.3	4.5	694.8	124652.3	6.8	0.3	61.4	32710.3	0.3	8.6	5117.8	946296.3	10	1.8	114.5	2800	0.4
Depressigyra globulus Clypeosectidae	10.8	779.9	157149.6	1.1	14.5	1986	991743.1	1.1	20.1	3105.4	557100.7	2.9	51.4	11294.7	6015887.9	13	44	26179.8	4840740.7	21	23.2	1515.1	37066.7	1.5
Clypeosectus curvus Lepetodrilidae	0.5	34.7	6984.4	0.1	0.2	20.2	10091.7	< 0.1	< 0.1	6.8	1222.1	< 0.1	0	0	0	0	0.1	50.1	9259.3	< 0.1	0	0	0	0
Lepetodrilus fucensis	42.7	3083.1	621283.6	12.5	39.5	5429.4	2711315	10.1	22.8	3519.5	621394.9	11.5	43	9457.6	5037383.2	19.4	30.1	17907.2	3311111.1	18.1	55	3586.1	87733.3	18.2
Arthropoda																								
Arachnida																								
Halacaridae																								
Copidognathus papillatus	4.9	349.6	70457.8	< 0.1	1.5	211.9	105810.4	< 0.1	4.9	754.7	135398.2	< 0.1	< 0.1	8.8	4672.9	< 0.1	< 0.1	60.1	11111.1	< 0.1	0	0	0	0
Amphipoda																								
Alicellidae																								
Parolicella cf. vaporalis Calliopiidae	< 0.1	1.6	330.3	< 0.1	< 0.1	6.1	3058.1	< 0.1	< 0.1	3.1	547.8	< 0.1	0	0	0	0	0	0	0	0	0	0	0	0
Orodonra cf. walkeri	< 0.1	4.7	943.8	< 0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lepyanaphasa sp.	0	0	0	0	0	0	0	0	0	0	0	0	< 0.1	1.5	1869.2	< 0.1	0	0	0	0	0	0	0	0
Crustacea																								
Philomedidae																								
Euphilomedes climax Cytheruridae	0.7	52	10476.6	< 0.1	10.9	1502.2	750152.9	0.1	0.2	23.3	4171.9	< 0.1	0.3	70.2	37383.2	< 0.1	9.1	5378.2	994444.4	< 0.1	3.3	218	5333.3	< 0.1
Xylocythere sp. nov.	2.9	206.8	41670.6	< 0.1	1.4	188	93883.8	< 0.1	2.7	413	74083.4	< 0.1	< 0.1	7	3738.3	< 0.1	0.3	170.3	31481.5	< 0.1	0.1	5.5	133.3	< 0.1
Pycnogonida																								
Ammotheidae																								
Sericosura verenae	0.6	42.6	8589.0	< 0.1	0.6	84.5	42201.8	0.5	0.7	113.5	20354	0.8	0.1	24.6	13084.1	0.2	0.6	360.6	66666.7	1.2	0.4	27.3	666.7	0.2
Sericosura verticula	0.2	15.2	3067.5	< 0.1	0.1	8	3975.5	0.5	< 0.1	1.9	337.1	0.8	< 0.1	1.8	934.6	< 0.1	0	0	0	0	0	0	0	0
Sericosura cf. dissita	0.1	5.6	1132.6	< 0.1	< 0.1	1.2	611.6	0.5	< 0.1	0.7	126.4	0.8	0	0	0	0	0	0	0	0	0	0	0	0
Nemertea																								
Unidentified	< 0.1	1.2	236.0	< 0.1	0	0	0	0	< 0.1	2.8	505.7	< 0.1	0	0	0	0	0	0	0	0	0	0	0	0
Echinodermata																								
Ophiuroidae	< 0.1	0.2	47.2	< 0.1	0	0	0	0	< 0.1	0.5	84.3	< 0.1	0	0	0	0	0	0	0	0	0	0	0	0

Fig. 2. Table 2 - Species List

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Table 3. Univariate measures of macrofaunal community structure associated with *Ridgeia piscesae* tubeworm bushes on the Grotto edifice: Sample Surface Area (SSA), Tube Height (TH), Tube Diameter (TD), volume (V), species richness (S), exponential of Shannon entropy (D), Simpson's diversity index (1-λ') and Pielou's evenness (J').

Sample	SSA (m^2)	TH (cm) ± sd	TD (cm) ± sd	TSA (m^2)	V (m^3)	S	D	1-λ'	J'
S1	0.12	17.14 ± 6.83	4.72 ± 0.82	4.27	0.02	28	5.377	0.728	0.505
S2	0.06	5.32 ± 2.47	2.24 ± 0.42	1.63	3.4×10^{-3}	24	5.398	0.749	0.531
S3	0.12	19.91 ± 9.31	5.48 ± 1.13	4.26	0.02	31	6.053	0.778	0.524
S4	0.02	7.15 ± 2.45	2.48 ± 0.57	0.57	1.1×10^{-3}	19	2.605	0.55	0.325
S5	0.02	3.46 ± 0.85	1.91 ± 0.34	0.10	5.4×10^{-4}	19	4.348	0.697	0.499
S6	0.01	6.15 ± 2.80	2.14 ± 0.43	0.18	7.5×10^{-4}	14	3.998	0.633	0.525

Fig. 3. Table 3- Sample descriptors