

# Trade-offs in a high CO<sub>2</sub> habitat on a subsea volcano: condition and reproductive features of a bathymodioline mussel

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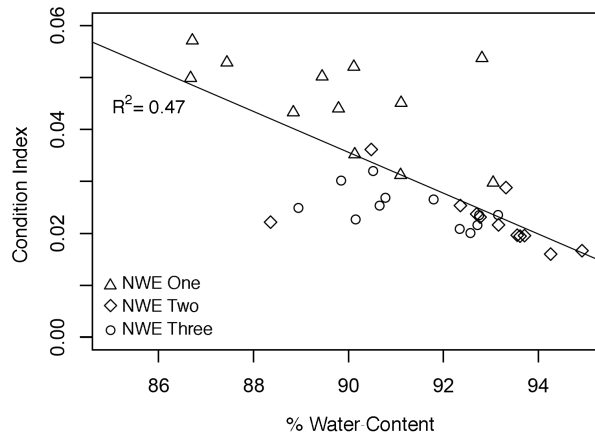


Figure S1: Condition index (including gills) and % water content in NWE One, Two and Three mussels are negatively correlated (Pearson correlation  $p < 0.001$ ).

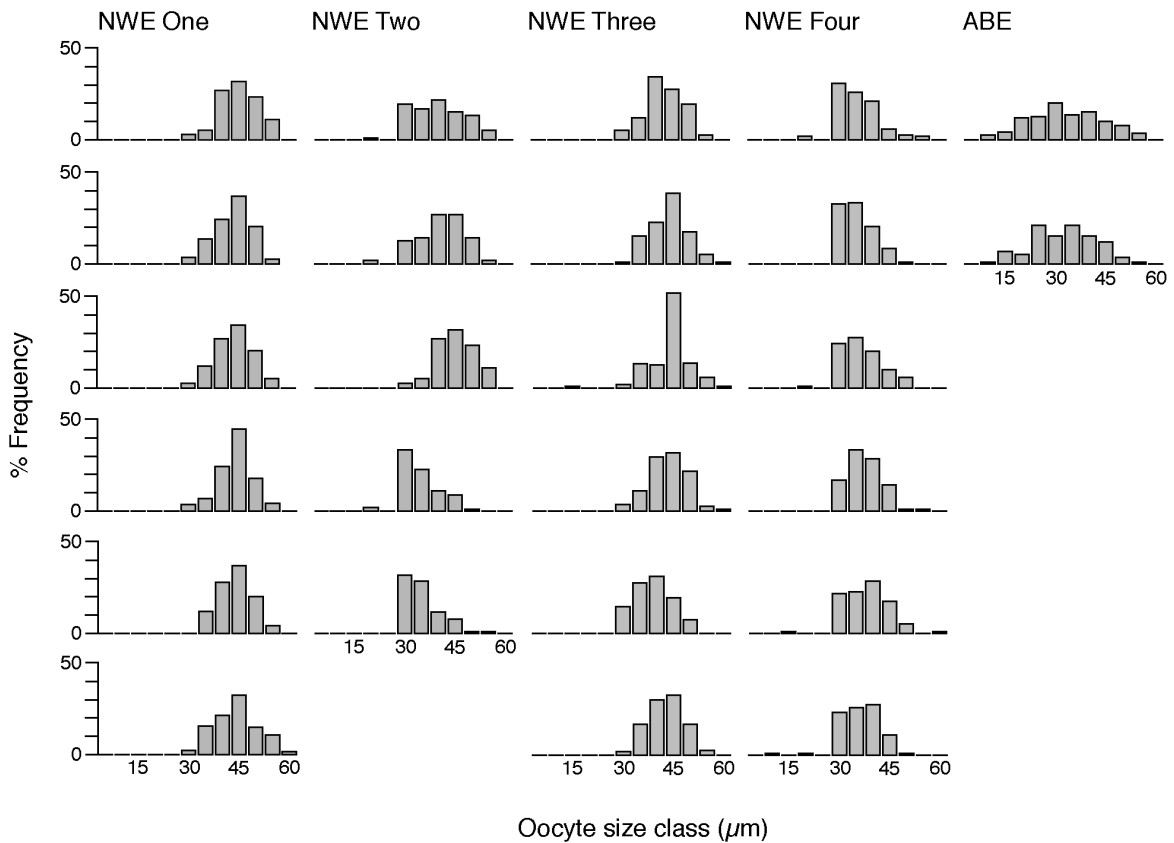


Figure S2: Oocyte size frequency distributions for each individual from all sites. Individual mussel distributions are comprised of 120 oocytes.

Table S1. Ranges of methane concentration, sulphide concentration, water weight, and condition indices in *Bathymodiolus* species ( $\pm$  standard deviation). ND: not detectable; - ; not available; T: thiotrophic; M: methanotrophic; subscripts indicates estimated values from the respective publications, 1) Tunnicliffe et al. (2009), 2) Podowski et al. (2010); 3) Sarradin et al. (1999).

Author	Species	Symbiont Type	Site	Location	Depth (m)	Sulphide ( $\mu\text{mol l}^{-1}$ )	Methane ( $\mu\text{mol l}^{-1}$ )	%Water content	CI (Total soft tissue dry weight/ shell volume)	CI (Total soft tissue AFDW/ shell volume)
This study	<i>B. septemdierum</i>	T	NWE One	NW Eifuku, Mariana Arc	1605	155 <sub>1</sub>	—	89.7 $\pm$ 2.1	0.048 $\pm$ 0.010	0.045 $\pm$ 0.009
This study	<i>B. septemdierum</i>	T	NWE Two	NW Eifuku, Mariana Arc	1606	n/a	—	92.7 $\pm$ 1.7	0.025 $\pm$ 0.006	0.023 $\pm$ 0.006
This study	<i>B. septemdierum</i>	T	NWE Three	NW Eifuku, Mariana Arc	1561	<1 <sub>1</sub>	—	91.4 $\pm$ 1.3	0.027 $\pm$ 0.004	0.025 $\pm$ 0.004
This study	<i>B. septemdierum</i>	T	NWE Four	NW Eifuku, Mariana Arc	1576	101 <sub>1</sub>	—	n/a	0.044 $\pm$ 0.007	0.042 $\pm$ 0.007
This study	<i>B. septemdierum</i>	T	Nifonea	Nifonea Ridge, Vanuatu	1900	n/a	—	n/a	0.048 $\pm$ 0.012	0.045 $\pm$ 0.011
This study	<i>B. septemdierum</i>	T	ABE	ELSC, Lau Basin	2130	0-131 <sub>2</sub>	—	n/a	0.038 $\pm$ 0.007	0.034 $\pm$ 0.019
Smith (1985)	<i>B. thermophilus</i>	T	Mussel Bed, Central	Galapagos Rift	2490	ND	—	84.1 $\pm$ 2.2	0.057 $\pm$ 0.011	—
Smith (1985)	<i>B. thermophilus</i>	T	Mussel Bed, Peripheral	Galapagos Rift	2490	ND	—	90.1 $\pm$ 1.8	0.010 $\pm$ 0.003	—
Fisher et al., (1988)	<i>B. thermophils</i>	T	Rose Garden, Central Clump	Galapagos Rift	—	0-325	—	79.1 $\pm$ 1.4	0.060 $\pm$ 0.008	—
Fisher et al., (1988)	<i>B. thermophils</i>	T	Rose Garden, Peripheral Site	Galapagos Rift	—	0-35	—	78 $\pm$ 1.3	0.056 $\pm$ 0.008	—
Fisher et al., (1988)	<i>B. thermophils</i>	T	Rose Garden, Peripheral Site	Galapagos Rift	—	0-8	—	80.3 $\pm$ 1.9	0.046 $\pm$ 0.006	—
Dattagupta et al. (2004)	<i>B. childressi</i>	M	Brine Pool NR1	Green Canyon, Gulf of Mexico	650	—	42-626 <sub>3</sub>	84.3 $\pm$ 3.2	—	0.10 $\pm$ 0.03
Dattagupta et al. (2004)	<i>B. childressi</i>	M	GC 234	Green Canyon, Gulf of Mexico	540	—	—	87.5 $\pm$ 2.7	—	0.06 $\pm$ 0.02
Dattagupta et al. (2004)	<i>B. childressi</i>	M	Bush Hill (BH)	Green Canyon, Gulf of Mexico	540-580	—	—	92.2 $\pm$ 1.6	—	0.04 $\pm$ 0.012
Nix et al. (1995)	<i>B. childressi</i>	M	Bush Hill (GC 184/185)	Green Canyon, Gulf of Mexico	540-580	ND	0-22	90.5 $\pm$ 1.3	0.051 $\pm$ 0.010	—
Nix et al.	<i>B. childressi</i>	M	GC 234	Green Canyon,	540	6746-7956	72-10744	89.3 $\pm$ 2.84	0.062 $\pm$ 0.020	—

Author	Species	Symbiont Type	Site	Location	Depth (m)	Sulphide ( $\mu\text{mol l}^{-1}$ )	Methane ( $\mu\text{mol l}^{-1}$ )	%Water content	CI (Total soft tissue dry weight/ shell volume)	CI (Total soft tissue AFDW/ shell volume)
(1995) Nix et al.	<i>B. childressi</i>	M	GC 272	Gulf of Mexico Green Canyon,	730	ND	2-4	90.0 $\pm$ 1.5	0.056 $\pm$ 0.011	—
(1995) Smith et al.	<i>B. childressi</i>	M	Brine Pool NR1, Inner Zone	Green Canyon, Gulf of Mexico	650	ND	136-2197	82.5 $\pm$ 1.8	—	0.12 $\pm$ 0.02
(2000) Smith et al.	<i>B. childressi</i>	M	Brine Pool NR1, Middle Zone	Green Canyon, Gulf of Mexico	650	<500	100-432	84.6 $\pm$ 1.0	—	0.10 $\pm$ 0.01
(2000) Smith et al.	<i>B. childressi</i>	M	Brine Pool NR1, Outer Zone	Green Canyon, Gulf of Mexico	650	>13000	35-799	83.9 $\pm$ 1.9	—	0.11 $\pm$ 0.02
Riou et al. (2010)	<i>B. azoricus</i>	T/M	PP30/PP31	Menez Gwen vent field, Mid- Atlantic Ridge	817	62 <sub>3</sub>	100 <sub>3</sub>	—	0.051-0.099	—
Bergquist et al. (2004)	<i>B. childressi</i>	M	Bush Hill (P1)	Green Canyon, Gulf of Mexico	540- 580	1, 0, 4, 0, 0	38, 0, 3, 0, 0	81.2, 84.1, 84.0, 88.1, 92.3	—	—
Bergquist et al. (2004)	<i>B. childressi</i>	M	GC 234 (P2)	Green Canyon, Gulf of Mexico	540	1, 0	0, 35	87.5, 86.3	—	—
Bergquist et al. (2004)	<i>B. childressi</i>	M	Brine Pool NR1 (B1)	Green Canyon, Gulf of Mexico	650	0, 42, 100, 1	19, 794, 1483, 433	87.5, 85.0, 80.7, 80.2	—	—
Bergquist et al. (2004)	<i>B. childressi</i>	M	Brine Pool 2 (B2)	Garden Banks, Gulf of Mexico	670	0	452	87.0	—	—

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