

Supplementary Material

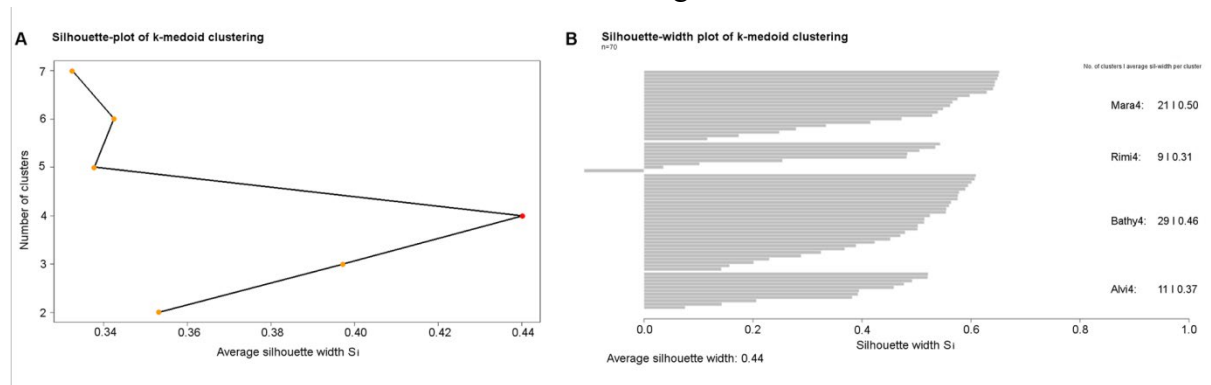
Detailed Mapping of Hydrothermal Vent Fauna: A 3D Reconstruction Approach Based on Video Imagery

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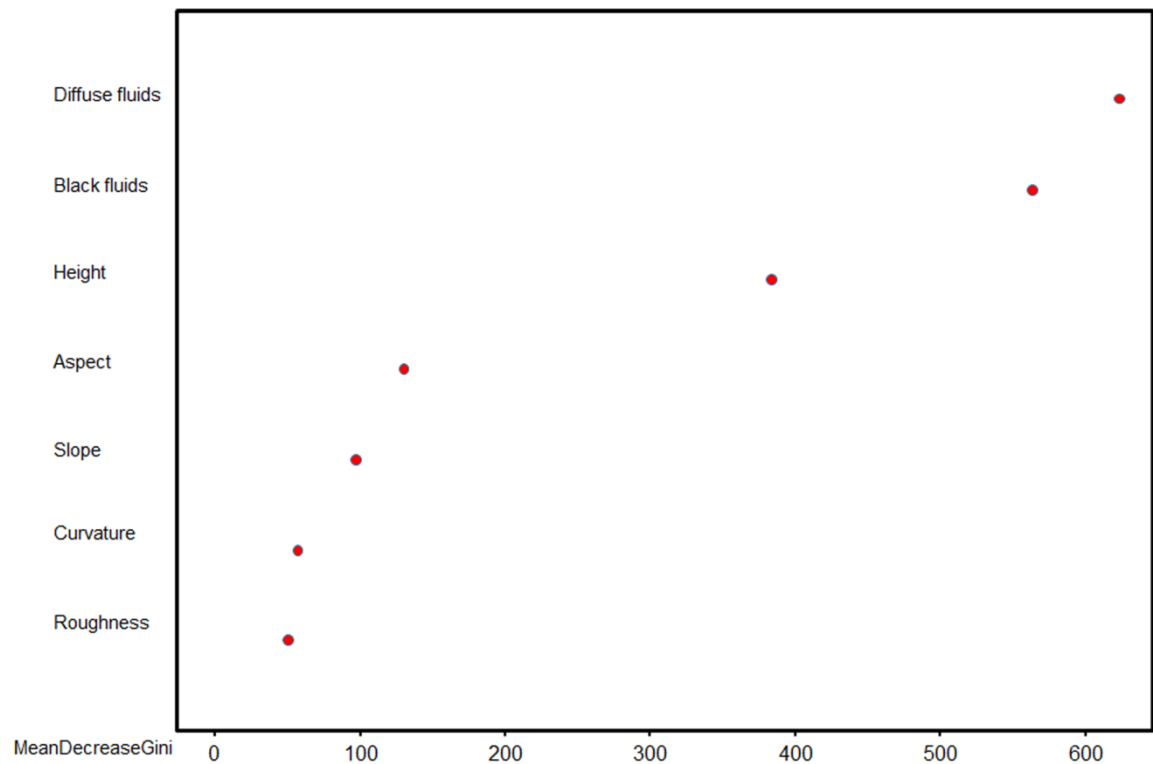
Supplementary Figure 1.

Supplementray Figure 1. (A) Silhouette-plot showing the average silhouette width of the k-medoid clustering. High silhouette width indicates a low intra-cluster variance and a high inter-cluster variance. (B) Silhouette-width plot showing to which faunal assemblage each of the 70 faunal patches belongs, the silhouette values of each faunal patch and the average silhouette width of each of the four faunal assemblages.



Supplementary Figure 2.

Supplementary Figure 2. VarImpPlot showing the importance of each terrain variable for the correct statistically defined faunal assemblage assignment of the random forest decision tree.



Supplementary Table 1.

Supplementray Table 1. (A) List of all 17 taxa that could be observed and their occurrence in the four assemblages.

Species or morphotype/ Assemblages	Alvi4	Rimi4	Bathy4	Mara4
<i>Mirocaris indica</i>				
<i>Alvinocaris solitaire</i>				
<i>Chrysomallon squamiferum</i>				
<i>Alviniconcha marisindica</i>				
<i>Rimicaris kairei</i>				
<i>Maractis</i> sp.				
<i>Austinograea rodriguezensis</i>				
<i>Phymorhynchus</i> sp.1				
<i>Phymorhynchus</i> sp.2				
<i>Phymorhynchus</i> sp.3				
<i>Bathymodiolus septemdierum</i>				
<i>Neolepas marisindica</i>				
<i>Lepetodrilus</i> sp.1				
<i>Lepetodrilus</i> sp.2				
<i>Munidopsis pallida</i>				
<i>Chiridota</i> sp.				
Zoarcidae gen. sp.				

Supplementray Table 1. (B) List of all 17 taxa that could be observed and their occurrence in the seven assemblages.

Species or morphotype/ Assemblages	SulChim7	Alvi7	Rimi7	Bathy7	Mara7	MarPhy7	Bacteria7
<i>Mirocaris indica</i>							
<i>Alvinocaris solitaire</i>							
<i>Chrysomallon squamiferum</i>							
<i>Alviniconcha marisindica</i>							
<i>Rimicaris kairei</i>							
<i>Maractis</i> sp.							
<i>Austinograea rodriguezensis</i>							
<i>Phymorhynchus</i> sp1.							
<i>Phymorhynchus</i> sp.2							
<i>Phymorhynchus</i> sp.3							
<i>Bathymodiolus septemdiarum</i>							
<i>Neolepas marisindica</i>							
<i>Lepetodrilus</i> sp.1							
<i>Lepetodrilus</i> sp.2							
<i>Munidopsis pallida</i>							
<i>Chiridota</i> sp.							
Zoarcidae gen. sp.							

Supplementary Table 2.

Supplementary Table 2. (A) Pairwise significance values derived from the 'pairwise.adonis' function in R for separation of all seven faunal assemblages.

Pairs	F.Model	R2	p.value	p.adjusted	sig	
1	Mara7 vs Rimi7	30.3501811	0.71664820	0.001	0.021	*
2	Mara7 vs Bathy7	33.1154441	0.48616646	0.001	0.021	*
3	Mara7 vs MarPhy7	2.0782953	0.17206860	0.123	1.000	
4	Mara7 vs Bacteria7	1.8293650	0.18611223	0.123	1.000	
5	Mara7 vs Alvi7	32.9981505	0.64704602	0.001	0.021	*
6	Mara7 vs SulChim7	5.5351089	0.52539646	0.145	1.000	
7	Rimi7 vs Bathy7	58.9739870	0.61447887	0.001	0.021	*
8	Rimi7 vs MarPhy7	15.8729401	0.56947491	0.001	0.021	*
9	Rimi7 vs Bacteria7	15.8153743	0.61263393	0.002	0.042	*
10	Rimi7 vs Alvi7	28.2683402	0.58564973	0.001	0.021	*
11	Rimi7 vs SulChim7	4.7794187	0.40574317	0.104	1.000	
12	Bathy7 vs MarPhy7	26.5799940	0.43163359	0.001	0.021	*
13	Bathy7 vs Bacteria7	19.4660536	0.37102187	0.001	0.021	*
14	Bathy7 vs Alvi7	95.6088008	0.68977439	0.001	0.021	*
15	Bathy7 vs SulChim7	8.8651831	0.22810090	0.027	0.567	
16	MarPhy7 vs Bacteria7	0.7730631	0.08811781	0.589	1.000	
17	MarPhy7 vs Alvi7	23.4371908	0.56560762	0.001	0.021	*
18	MarPhy7 vs SulChim7	1.8164911	0.26648478	0.291	1.000	
19	Bacteria7 vs Alvi7	19.2192371	0.54570282	0.001	0.021	*
20	Bacteria7 vs SulChim7	1.7500644	0.36842962	0.200	1.000	
21	Alvi7 vs SulChim7	6.4327579	0.33102650	0.069	1.000	

Significance codes: '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Supplementary Table 2. (B) Pairwise significance values derived from the 'pairwise.adonis' function in R for separation of all four faunal assemblages.

Pairs		F.Model	R2	p.value	p.adjusted	sig
1	Mara4 vs Rimi4	16.07007	0.3646482	0.001	0.006	**
2	Mara4 vs Bathy4	29.93630	0.3841124	0.001	0.006	**
3	Mara4 vs Alvi4	22.60454	0.4297070	0.001	0.006	**
4	Rimi4 vs Bathy4	70.40622	0.6616739	0.001	0.006	**
5	Rimi4 vs Alvi4	34.60474	0.6578255	0.001	0.006	**
6	Bathy4 vs Alvi4	109.23373	0.7419070	0.001	0.006	**

Significance codes: '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Supplementary Table 3.

Supplementary Table 3. (A) Confusion matrix, Classification error and prediction accuracy of the seven faunal assemblages from the random forest model, respectively.

Random Forest Classification								
OBB estimate of error rate: 24.73 %			ntree=5000			mtry=7		
Confusion Matrix:								
	Alvi7	Bacteria7	Bathy7	Mara7	MarPhy7	Rimi7	SulChim7	Class. Error
Alvi7	1189	3	46	0	18	117	30	0.15253029
Bacteria7	0	718	0	0	31	0	0	0.04138852
Bathy7	724	93	5236	303	577	1277	219	0.37881125
Mara7	616	28	1245	8369	443	923	132	0.2881082
MarPhy7	504	991	1365	186	14343	60	0	0.17800447
Rimi7	71	0	64	29	3	1024	72	0.18923199
SulChim7	2	0	1	0	0	0	88	0.03296703
Random Forest Accuracy								
Total Prediction Accuracy: 0.4405142								
	Prediction							
True	Alvi7	Bacteria7	Bathy7	Mara7				Class. Error
Alvi7	130481	249	5059	46				0.03941547
Bacteria7	0	74897	21	0				0.00028031
Bathy7	91910	17505	688630	42126				0.18036923
Mara7	94322	4378	183645	918425				0.23513662
MarPhy7	327154	424200	892581	84553				1.00000000
Rimi7	45053	0	58229	21710				1.00000000
SulChim7	2980	0	6002	202				1.00000000

Supplementary Table 3. (B) Confusion matrix, Classification error and prediction accuracy of the four faunal assemblages from the random forest model, respectively.

Random Forest					
OBB estimate of error rate: 14.96 %		ntrec=5000		mtry=7	
Confusion Matrix:					
	Alvi4	Bathy4	Mara4	Rimi4	Class. Error
Alvi4	618	9	1	5	0.02369668
Bathy4	283	6192	410	673	0.18073564
Mara4	474	3023	26827	1165	0.14805170
Rimi4	16	78	9	1292	0.07383513
Random Forest Accuracy					
Total Prediction Accuracy: 0.8496985					
	Predicted				
True	Alvi4	Bathy4	Mara4	Rimi4	Class. Error
Alvi4	60875	1326	335	754	0.03815769
Bathy4	30596	614743	35530	64434	0.17517708
Mara4	45712	302492	2698586	126868	0.20010090
Rimi4	1117	8890	340	121760	0.07832288

Supplementary Video 1. Fly through the reconstructed 3D chimney model.