Deep-sea nematodes of the Mozambique Channel: evidence of random community assembly dynamics in seep sediments

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Table 1: Sampling stations latitude, longitude (in decimal degrees) and depth.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Operation | Station | Type | Latitude | Longitude | Depth (m) |
| MTB1 | Madagascar slope/Betsiboka | Reference | -15.367453 | 45.986817 | 529 |
| MTB3 | Madagascar slope/Betsiboka | Reference | -15.361595 | 45.956478 | 757 |
| MTB6 | Madagascar slope/Mahahavy | Pockmark | -15.519155 | 45.715518 | 789 |
| MTB9 | Madagascar slope/Mahahavy | Reference | -15.363392 | 45.960492 | 742 |
| MTB10 | Zambèze Valley | Abyssal | -21.530638 | 41.345608 | 3205 |
| MTB13 | Tsiribihina Valley | Abyssal | -21.518392 | 41.861325 | 3082 |
| KGS7 | Zambèze Lobes | Abyssal | -25.426928 | 41.595397 | 4076 |



Figure 1S: Phylum-level taxonomic assignments of rarefied ASVs in the Abyssal, Pockmark and Reference Area.



Figure 2S: Unique and shared Nematoda ASVs by replicate. Main panel: number above bars indicate number of Nematoda ASVs found in samples marked by filled circles; bottom left graph: total number of Nematoda ASVs in each of the Abyssal, Pockmark and Reference Area replicates (0-5 cm sediment intervals pooled).



Figure S: Absolute (top) and relative (bottom) abundance of nematode genera identified morphologically of the 0-1 cm interval in the Abyssal, Pockmark and Reference Areas.



Figure S: Alpha diversity metrics (Richness, Shannon (*H’*), Simpson (1- *D*), occurrence-based Index of Relative Rarity) of morphologically identified nematodes of the 0-1 cm interval in the Abyssal, Pockmark and Reference Areas. Error bars represent standard deviation.



Figure 5S: Absolute abundance of meiofauna phyla identified morphologically in the Abyssal, Pockmark and Reference areas along the sediment vertical profile

Table 2: Average (Avg.) and standard deviation (St. dev.) of the relative abundance of nematode genera of rarefied ASVs in the Abyssal, Pockmark and Reference areas.

|  |  |  |  |
| --- | --- | --- | --- |
| Genus | Abyssal | Pockmark | Reference |
| Avg. | St. dev. | Avg. | St. dev. | Avg. | St. dev. |
| *Acantholaimus* | 7.342 | 0.602 | 3.324 | 0.081 | 6.490 | 0.546 |
| *Achromadora* | 0.758 | 0.372 | 1.043 | 0.092 | 0.669 | 0.197 |
| *Aegialoalaimus* | 0.000 | 0.000 | 0.034 | 0.048 | 0.000 | 0.000 |
| *Alaimella* | 0.168 | 0.124 | 0.141 | 0.127 | 0.206 | 0.144 |
| *Alaimus* | 0.027 | 0.058 | 0.000 | 0.000 | 0.017 | 0.032 |
| *Amphimonhystrella* | 0.010 | 0.028 | 0.034 | 0.048 | 0.000 | 0.000 |
| *Anticoma* | 0.370 | 0.382 | 0.329 | 0.103 | 0.586 | 0.411 |
| *Aphanolaimus* | 0.000 | 0.000 | 0.000 | 0.000 | 0.016 | 0.031 |
| *Ascolaimus* | 0.115 | 0.094 | 0.217 | 0.010 | 0.119 | 0.142 |
| *Astomonema* | 0.355 | 0.118 | 0.503 | 0.081 | 0.902 | 1.216 |
| *Atrochromadora* | 0.000 | 0.000 | 0.036 | 0.051 | 0.000 | 0.000 |
| *Bathyeurystomina* | 0.146 | 0.136 | 0.000 | 0.000 | 0.187 | 0.142 |
| *Calomicrolaimus* | 0.258 | 0.170 | 0.177 | 0.134 | 0.199 | 0.139 |
| *Ceramonema* | 0.211 | 0.162 | 0.038 | 0.054 | 0.103 | 0.086 |
| *Chromadorita* | 0.273 | 0.213 | 0.360 | 0.037 | 0.292 | 0.082 |
| *Cyartonema* | 0.040 | 0.059 | 0.217 | 0.010 | 0.084 | 0.074 |
| *Cyatholaimus* | 0.034 | 0.076 | 0.038 | 0.054 | 0.124 | 0.045 |
| *Cylindrolaimus* | 0.068 | 0.068 | 0.070 | 0.050 | 0.055 | 0.080 |
| *Daptonema* | 0.135 | 0.093 | 0.503 | 0.081 | 0.414 | 0.173 |
| *Deontolaimus* | 1.320 | 0.386 | 0.438 | 0.193 | 0.954 | 0.266 |
| *Desmolaimus* | 1.224 | 0.394 | 3.583 | 0.318 | 0.998 | 0.355 |
| *Desmoscolex* | 19.468 | 0.981 | 10.897 | 0.380 | 15.129 | 1.543 |
| *Diplolaimelloides* | 0.076 | 0.075 | 0.069 | 0.097 | 0.221 | 0.138 |
| *Diplopeltula* | 0.081 | 0.109 | 0.000 | 0.000 | 0.114 | 0.104 |
| *Doliolaimus* | 0.083 | 0.164 | 0.070 | 0.050 | 0.192 | 0.056 |
| *Dorylaimopsis* | 0.020 | 0.057 | 0.000 | 0.000 | 0.006 | 0.018 |
| *Enoplolaimus* | 0.000 | 0.000 | 0.000 | 0.000 | 0.007 | 0.020 |
| *Epacanthion* | 0.139 | 0.100 | 0.000 | 0.000 | 0.060 | 0.057 |
| *Eumonhystera* | 0.085 | 0.065 | 0.145 | 0.103 | 0.097 | 0.103 |
| *Halalaimus* | 8.199 | 1.320 | 7.769 | 0.838 | 9.133 | 0.701 |
| *Halichoanolaimus* | 0.534 | 0.259 | 0.185 | 0.112 | 0.467 | 0.182 |
| *Halomonhystera* | 0.148 | 0.047 | 0.072 | 0.051 | 0.272 | 0.114 |
| *Leptolaimus* | 0.105 | 0.115 | 0.070 | 0.050 | 0.014 | 0.027 |
| *Litinium* | 1.206 | 0.511 | 0.402 | 0.236 | 0.658 | 0.152 |
| *Manganonema* | 0.337 | 0.301 | 0.145 | 0.103 | 0.363 | 0.123 |
| *Metachromadora* | 0.024 | 0.047 | 0.034 | 0.048 | 0.000 | 0.000 |
| *Metoncholaimus* | 0.034 | 0.076 | 0.000 | 0.000 | 0.028 | 0.041 |
| *Molgolaimus* | 0.143 | 0.102 | 0.253 | 0.104 | 0.173 | 0.063 |
| *Monhystrella* | 0.000 | 0.000 | 0.000 | 0.000 | 0.035 | 0.045 |
| *Onchium* | 0.076 | 0.089 | 0.000 | 0.000 | 0.133 | 0.076 |
| *Oxystomina* | 0.866 | 0.466 | 0.545 | 0.106 | 0.668 | 0.276 |
| *Paramphimonhystrella* | 0.015 | 0.043 | 0.000 | 0.000 | 0.014 | 0.039 |
| *Paraphanolaimus* | 0.055 | 0.079 | 0.000 | 0.000 | 0.008 | 0.022 |
| *Paraplectonema* | 0.054 | 0.067 | 0.000 | 0.000 | 0.006 | 0.018 |
| *Pareurystomina* | 0.025 | 0.049 | 0.000 | 0.000 | 0.000 | 0.000 |
| *Pellioditis* | 0.000 | 0.000 | 0.000 | 0.000 | 0.007 | 0.019 |
| *Phanodermopsis* | 1.004 | 0.257 | 0.615 | 0.060 | 0.681 | 0.176 |
| *Prismatolaimus* | 0.027 | 0.075 | 0.000 | 0.000 | 0.104 | 0.125 |
| *Ptycholaimellus* | 0.036 | 0.067 | 0.000 | 0.000 | 0.014 | 0.039 |
| *Rhabdocoma* | 0.084 | 0.116 | 0.112 | 0.094 | 0.115 | 0.083 |
| *Rhabdolaimus* | 0.062 | 0.091 | 0.034 | 0.048 | 0.024 | 0.068 |
| *Romanomermis* | 0.055 | 0.092 | 0.038 | 0.054 | 0.007 | 0.019 |
| *Sabatieria* | 1.838 | 0.475 | 2.802 | 0.601 | 2.694 | 0.448 |
| *Setosabatieria* | 0.278 | 0.170 | 0.651 | 0.029 | 0.531 | 0.358 |
| *Setostephanolaimus* | 0.031 | 0.061 | 0.000 | 0.000 | 0.000 | 0.000 |
| *Siphonolaimus* | 0.011 | 0.031 | 0.036 | 0.051 | 0.000 | 0.000 |
| *Sphaerolaimus* | 0.851 | 0.296 | 0.834 | 0.084 | 1.644 | 0.493 |
| *Spilophorella* | 0.000 | 0.000 | 0.000 | 0.000 | 0.010 | 0.028 |
| *Subsphaerolaimus* | 0.813 | 0.259 | 2.742 | 0.260 | 1.068 | 0.439 |
| *Symplocostoma* | 0.000 | 0.000 | 0.000 | 0.000 | 0.025 | 0.037 |
| *Syringolaimus* | 2.273 | 0.771 | 0.982 | 0.188 | 1.389 | 0.492 |
| *Thalassoalaimus* | 0.567 | 0.290 | 0.835 | 0.277 | 0.604 | 0.255 |
| *Thalassomonhystera* | 0.000 | 0.000 | 0.000 | 0.000 | 0.048 | 0.068 |
| *Theristus* | 0.064 | 0.073 | 0.000 | 0.000 | 0.088 | 0.087 |
| *Thoracostoma* | 0.000 | 0.000 | 0.000 | 0.000 | 0.006 | 0.018 |
| *Thoracostomopsis* | 0.000 | 0.000 | 0.000 | 0.000 | 0.027 | 0.042 |
| *Trefusia* | 0.026 | 0.049 | 0.000 | 0.000 | 0.103 | 0.091 |
| *Tripyloides* | 0.070 | 0.092 | 0.036 | 0.051 | 0.052 | 0.071 |
| Unassigned | 47.087 | 1.602 | 57.959 | 1.917 | 50.125 | 2.033 |
| *Viscosia* | 0.128 | 0.181 | 0.579 | 0.107 | 0.264 | 0.137 |
| *Wieseria* | 0.044 | 0.076 | 0.000 | 0.000 | 0.095 | 0.062 |
| *Zygonemella* | 0.026 | 0.050 | 0.000 | 0.000 | 0.062 | 0.088 |

Table 3: Average (Avg.) and standard deviation (St. dev.) for alpha-diversity metrics (Richness, Shannon, Simpson, Rarity) for rarefied Nematoda ASVs and their generic composition (Nematoda Genera) in the Abyssal, Pockmark and Reference areas along the sediment vertical profile.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Level | Area | Interval | Richness | Shannon | Simpson | Rarity |
| Avg. | St. dev. | Avg. | St. dev. | Avg. | St. dev. | Avg. | St. dev. |
| Nematoda | Abyssal | 0-1cm | 268.750 | 113.854 | 3.967 | 0.604 | 0.929 | 0.066 | 0.711 | 0.073 |
| 1-2cm | 234.444 | 99.675 | 3.781 | 0.648 | 0.918 | 0.046 | 0.659 | 0.082 |
| 2-3cm | 149.667 | 108.397 | 3.507 | 0.799 | 0.914 | 0.070 | 0.604 | 0.127 |
| 3-4cm | 127.556 | 62.041 | 2.914 | 0.891 | 0.804 | 0.180 | 0.566 | 0.137 |
| 4-5cm | 144.444 | 79.911 | 2.922 | 1.104 | 0.789 | 0.165 | 0.586 | 0.105 |
| Pockmark | 0-1cm | 182.000 | 43.205 | 3.666 | 0.143 | 0.932 | 0.014 | 0.494 | 0.071 |
| 1-2cm | 237.333 | 9.741 | 3.843 | 0.107 | 0.943 | 0.020 | 0.520 | 0.005 |
| 2-3cm | 203.000 | 43.367 | 3.655 | 0.116 | 0.944 | 0.009 | 0.487 | 0.087 |
| 3-4cm | 174.333 | 30.944 | 3.333 | 0.048 | 0.926 | 0.001 | 0.490 | 0.039 |
| 4-5cm | 126.667 | 40.078 | 2.534 | 0.218 | 0.786 | 0.066 | 0.467 | 0.102 |
| Reference | 0-1cm | 352.000 | 124.417 | 4.232 | 0.604 | 0.956 | 0.027 | 0.658 | 0.037 |
| 1-2cm | 333.500 | 146.374 | 4.225 | 0.654 | 0.958 | 0.030 | 0.633 | 0.070 |
| 2-3cm | 268.167 | 122.612 | 3.454 | 1.343 | 0.816 | 0.302 | 0.588 | 0.059 |
| 3-4cm | 259.400 | 109.162 | 4.069 | 0.276 | 0.964 | 0.005 | 0.627 | 0.044 |
| 4-5cm | 174.000 | 80.372 | 3.140 | 0.760 | 0.855 | 0.098 | 0.569 | 0.106 |
| Nematoda Genera | Abyssal | 0-1cm | 23.500 | 3.808 | 2.228 | 0.152 | 0.809 | 0.024 | 0.183 | 0.055 |
| 1-2cm | 22.000 | 4.619 | 2.182 | 0.139 | 0.803 | 0.029 | 0.146 | 0.043 |
| 2-3cm | 16.333 | 6.254 | 2.058 | 0.252 | 0.796 | 0.051 | 0.136 | 0.077 |
| 3-4cm | 16.667 | 5.617 | 2.071 | 0.280 | 0.797 | 0.045 | 0.114 | 0.065 |
| 4-5cm | 16.333 | 5.538 | 2.063 | 0.161 | 0.800 | 0.026 | 0.088 | 0.078 |
| Pockmark | 0-1cm | 19.333 | 5.437 | 2.233 | 0.202 | 0.827 | 0.020 | 0.141 | 0.042 |
| 1-2cm | 22.000 | 1.633 | 2.407 | 0.031 | 0.854 | 0.004 | 0.129 | 0.041 |
| 2-3cm | 18.333 | 2.867 | 2.397 | 0.095 | 0.873 | 0.014 | 0.087 | 0.026 |
| 3-4cm | 19.333 | 1.700 | 2.466 | 0.131 | 0.878 | 0.019 | 0.154 | 0.010 |
| 4-5cm | 14.667 | 2.494 | 2.238 | 0.072 | 0.859 | 0.008 | 0.096 | 0.012 |
| Reference | 0-1cm | 29.333 | 5.185 | 2.280 | 0.104 | 0.814 | 0.017 | 0.238 | 0.015 |
| 1-2cm | 29.000 | 7.979 | 2.371 | 0.151 | 0.832 | 0.021 | 0.197 | 0.086 |
| 2-3cm | 24.500 | 6.371 | 2.369 | 0.176 | 0.849 | 0.026 | 0.153 | 0.053 |
| 3-4cm | 22.200 | 5.564 | 2.327 | 0.200 | 0.842 | 0.022 | 0.159 | 0.040 |
| 4-5cm | 17.833 | 3.023 | 2.292 | 0.140 | 0.853 | 0.019 | 0.101 | 0.044 |

Table 4: Results of statistical testing (p-value) for data normality (Shapiro-Wilk, S-W.Ar./S-W.Int. for Area and Interval, respectively), homoscedasticity (Levene) and 2-way analysis of variance (ANOVA) for alpha-diversity metrics (Richness, Shannon, Simpson, Rarity) in rarefied Nematoda ASVs and their generic composition (Nematoda Genera) in the Abyssal, Pockmark and Reference areas along the sediment vertical profile. Significant values indicated in grey (α=0.05).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Level | Area | Interval | Richness | Shannon | Simpson | Rarity |
| S-W.Int. | S-W.Ar. | Levene | ANOVA | S-W.Int. | S-W.Ar. | Levene | ANOVA | S-W.Int. | S-W.Ar. | Levene | ANOVA | S-W.Int. | S-W.Ar. | Levene | ANOVA |
| Nematoda | Abyssal | 0-1cm | 0.169 | 0.002 | Area | Area | 0.287 | 0.158 | Area | Area | 0.005 | 0.000 | Area | Area | 0.014 | 0.009 | Area | Area |
| 1-2cm | 0.941 |  | 0.008 | 0.001 | 0.717 |  | 0.129 | 0.101 | 0.486 |  | 0.433 | 0.403 | 0.129 |  | 0.045 | 0.000 |
| 2-3cm | 0.053 |  | Interval | Interval | 0.751 |  | Interval | Interval | 0.003 |  | Interval | Interval | 0.011 |  | Interval | Interval |
| 3-4cm | 0.947 |  | 0.147 | 0.001 | 0.813 |  | 0.650 | 0.001 | 0.009 |  | 0.177 | 0.032 | 0.196 |  | 0.959 | 0.027 |
| 4-5cm | 0.092 |  | Ar.\*Int. | Ar.\*Int. | 0.543 |  | Ar.\*Int. | Ar.\*Int. | 0.341 |  | Ar.\*Int. | Ar.\*Int. | 0.524 |  | Ar.\*Int. | Ar.\*Int. |
| Pockmark | 0-1cm | 0.363 | 0.821 | 0.328 | 0.840 | 0.988 | 0.002 | 0.335 | 0.748 | 0.979 | 0.000 | 0.383 | 0.454 | 0.346 | 0.195 | 0.721 | 0.866 |
| 1-2cm | 0.241 |  |  | Residuals | 0.093 |  |  | Residuals | 0.024 |  |  | Residuals | 0.588 |  |  | Residuals |
| 2-3cm | 0.528 |  |  | 0.950 | 0.955 |  |  | 0.004 | 0.909 |  |  | 0.000 | 0.848 |  |  | 0.005 |
| 3-4cm | 0.126 |  |  |  | 0.172 |  |  |  | 0.140 |  |  |  | 0.960 |  |  |  |
| 4-5cm | 0.888 |  |  |  | 0.814 |  |  |  | 0.501 |  |  |  | 0.386 |  |  |  |
| Reference | 0-1cm | 0.520 | 0.396 |  |  | 0.448 | 0.000 |  |  | 0.623 | 0.000 |  |  | 0.921 | 0.233 |  |  |
| 1-2cm | 0.478 |  |  |  | 0.234 |  |  |  | 0.076 |  |  |  | 0.998 |  |  |  |
| 2-3cm | 0.882 |  |  |  | 0.001 |  |  |  | 0.000 |  |  |  | 0.416 |  |  |  |
| 3-4cm | 0.435 |  |  |  | 0.174 |  |  |  | 0.184 |  |  |  | 0.371 |  |  |  |
| 4-5cm | 0.223 |  |  |  | 0.758 |  |  |  | 0.166 |  |  |  | 0.980 |  |  |  |
| Nematoda Genera | Abyssal | 0-1cm | 0.859 | 0.618 | Area | Area | 0.254 | 0.005 | Area | Area | 0.330 | 0.046 | Area | Area | 0.366 | 0.333 | Area | Area |
| 1-2cm | 0.461 |  | 0.033 | 0.000 | 0.164 |  | 0.656 | 0.000 | 0.070 |  | 0.079 | 0.000 | 0.231 |  | 0.071 | 0.017 |
| 2-3cm | 0.649 |  | Interval | Interval | 0.533 |  | Interval | Interval | 0.703 |  | Interval | Interval | 0.435 |  | Interval | Interval |
| 3-4cm | 0.649 |  | 0.273 | 0.000 | 0.040 |  | 0.236 | 0.527 | 0.430 |  | 0.117 | 0.670 | 0.959 |  | 0.862 | 0.000 |
| 4-5cm | 0.158 |  | Ar.\*Int. | Ar.\*Int. | 0.858 |  | Ar.\*Int. | Ar.\*Int. | 0.482 |  | Ar.\*Int. | Ar.\*Int. | 0.100 |  | Ar.\*Int. | Ar.\*Int. |
| Pockmark | 0-1cm | 0.583 | 0.505 | 0.953 | 0.771 | 0.822 | 0.739 | 0.769 | 0.537 | 0.392 | 0.363 | 0.164 | 0.388 | 0.283 | 0.961 | 0.485 | 0.744 |
| 1-2cm | 1.000 |  |  | Residuals | 0.617 |  |  | Residuals | 0.491 |  |  | Residuals | 0.433 |  |  | Residuals |
| 2-3cm | 0.843 |  |  | 0.211 | 0.224 |  |  | 0.008 | 0.387 |  |  | 0.024 | 0.053 |  |  | 0.694 |
| 3-4cm | 0.463 |  |  |  | 0.231 |  |  |  | 0.492 |  |  |  | 0.800 |  |  |  |
| 4-5cm | 0.637 |  |  |  | 0.087 |  |  |  | 0.172 |  |  |  | 0.046 |  |  |  |
| Reference | 0-1cm | 0.315 | 0.118 |  |  | 0.010 | 0.455 |  |  | 0.791 | 0.632 |  |  | 0.840 | 0.218 |  |  |
| 1-2cm | 0.040 |  |  |  | 0.733 |  |  |  | 0.242 |  |  |  | 0.083 |  |  |  |
| 2-3cm | 0.389 |  |  |  | 0.499 |  |  |  | 0.568 |  |  |  | 0.440 |  |  |  |
| 3-4cm | 0.301 |  |  |  | 0.278 |  |  |  | 0.261 |  |  |  | 0.875 |  |  |  |
| 4-5cm | 0.229 |  |  |  | 0.822 |  |  |  | 0.480 |  |  |  | 0.506 |  |  |  |

Table 5: Tukey's HSD (Honestly Significant Difference) test results (p-value) for pairwise comparisons of alpha-diversity metrics (Richness, Shannon, Simpson, Rarity) in rarefied Nematoda ASVs and their generic composition (Nematoda Genera) in the Abyssal, Pockmark and Reference areas along the sediment vertical profile. Significant values indicated in grey (α=0.05).

|  |  |  |
| --- | --- | --- |
| Area | Nematoda | Nematoda Genera |
| Richness | Shannon | Simpson | Rarity | Richness | Shannon | Simpson | Rarity |
| Pockmark-Abyssal | 0.999 |  |  | 0.000 | 0.997 | 0.001 | 0.000 | 0.831 |
| Reference-Abyssal | 0.001 |  |  | 0.936 | 0.000 | 0.000 | 0.000 | 0.034 |
| Reference-Pockmark | 0.019 |  |  | 0.001 | 0.005 | 0.943 | 0.127 | 0.043 |
| Interval |  |
| 1-2cm-0-1cm | 0.996 | 1.000 | 1.000 | 0.918 | 1.000 |  |  | 0.494 |
| 2-3cm-0-1cm | 0.153 | 0.423 | 0.780 | 0.166 | 0.054 |  |  | 0.042 |
| 3-4cm-0-1cm | 0.047 | 0.155 | 0.615 | 0.111 | 0.036 |  |  | 0.060 |
| 4-5cm-0-1cm | 0.005 | 0.003 | 0.043 | 0.048 | 0.001 |  |  | 0.000 |
| 2-3cm-1-2cm | 0.287 | 0.543 | 0.798 | 0.595 | 0.080 |  |  | 0.708 |
| 3-4cm-1-2cm | 0.102 | 0.222 | 0.634 | 0.466 | 0.053 |  |  | 0.779 |
| 4-5cm-1-2cm | 0.013 | 0.004 | 0.044 | 0.273 | 0.001 |  |  | 0.016 |
| 3-4cm-2-3cm | 0.981 | 0.973 | 0.998 | 0.999 | 1.000 |  |  | 1.000 |
| 4-5cm-2-3cm | 0.678 | 0.225 | 0.421 | 0.981 | 0.570 |  |  | 0.307 |
| 4-5cm-3-4cm | 0.943 | 0.581 | 0.621 | 0.998 | 0.712 |  |  | 0.269 |

Table 6: Average (Avg.) and standard deviation (St. dev.) of the relative abundance of nematode genera of 0-1 cm interval of the morphological samples in the Abyssal, Pockmark and Reference areas.

|  |  |  |  |
| --- | --- | --- | --- |
| Genus | Abyssal | Pockmark | Reference |
| Avg | St. dev. | Avg | St. dev. | Avg | St. dev. |
| *Acantholaimus* | 13.276 | 4.132 | 0.000 | 0.000 | 1.568 | 1.913 |
| *Actinonema* | 0.000 | 0.000 | 0.000 | 0.000 | 1.020 | 1.695 |
| *Aegialoalaimus* | 0.170 | 0.380 | 0.327 | 0.462 | 0.734 | 1.375 |
| *Alaimella* | 0.000 | 0.000 | 0.000 | 0.000 | 0.113 | 0.321 |
| *Ammotheristus* | 0.000 | 0.000 | 0.000 | 0.000 | 0.227 | 0.452 |
| *Amphimonhystera* | 0.000 | 0.000 | 0.000 | 0.000 | 0.242 | 0.453 |
| *Amphimonhystrella* | 2.813 | 3.207 | 0.327 | 0.462 | 1.818 | 3.778 |
| *Anoplostoma* | 0.000 | 0.000 | 0.321 | 0.453 | 0.000 | 0.000 |
| *Anticyathus* | 0.170 | 0.380 | 0.000 | 0.000 | 0.201 | 0.391 |
| *Antomicron* | 0.000 | 0.000 | 0.000 | 0.000 | 0.150 | 0.425 |
| *Apenodraconema* | 0.000 | 0.000 | 0.000 | 0.000 | 0.150 | 0.425 |
| *Araeolaimus* | 0.000 | 0.000 | 0.327 | 0.462 | 0.117 | 0.331 |
| *Astomonema* | 0.000 | 0.000 | 0.000 | 0.000 | 0.171 | 0.483 |
| *Bathyeurystomina* | 0.412 | 0.583 | 0.000 | 0.000 | 0.382 | 0.546 |
| *Belbolla* | 0.000 | 0.000 | 0.000 | 0.000 | 0.077 | 0.217 |
| *Bolbolaimus* | 0.000 | 0.000 | 0.000 | 0.000 | 0.125 | 0.353 |
| *Bolbonema* | 0.000 | 0.000 | 0.000 | 0.000 | 0.117 | 0.331 |
| *Calligyrus* | 0.000 | 0.000 | 0.000 | 0.000 | 1.426 | 2.379 |
| *Calomicrolaimus* | 0.926 | 0.987 | 0.000 | 0.000 | 0.132 | 0.374 |
| *Calyptronema* | 0.000 | 0.000 | 0.000 | 0.000 | 0.150 | 0.425 |
| *Campylaimus* | 1.101 | 1.233 | 0.000 | 0.000 | 0.302 | 0.437 |
| *Cervonema* | 0.000 | 0.000 | 0.000 | 0.000 | 0.118 | 0.334 |
| *Chromadorella* | 0.249 | 0.556 | 0.980 | 1.386 | 1.232 | 2.364 |
| *Chromadorina* | 0.000 | 0.000 | 1.307 | 1.849 | 0.077 | 0.217 |
| *Chromadorita* | 0.000 | 0.000 | 0.654 | 0.924 | 1.071 | 1.658 |
| *Cobbia* | 16.004 | 9.472 | 0.327 | 0.462 | 2.027 | 3.452 |
| *Comesomoides* | 0.000 | 0.000 | 0.654 | 0.924 | 0.000 | 0.000 |
| *Crenopharynx* | 0.000 | 0.000 | 0.000 | 0.000 | 0.125 | 0.353 |
| *Cyartonema* | 0.000 | 0.000 | 0.321 | 0.453 | 0.194 | 0.372 |
| *Cyatholaimus* | 0.000 | 0.000 | 0.327 | 0.462 | 0.150 | 0.425 |
| *Daptonema* | 1.572 | 1.274 | 0.000 | 0.000 | 1.961 | 2.065 |
| *Dasynemoides* | 0.170 | 0.380 | 0.000 | 0.000 | 0.190 | 0.364 |
| *Deontolaimus* | 1.033 | 1.072 | 0.000 | 0.000 | 1.012 | 0.962 |
| *Desmodora* | 1.563 | 1.933 | 45.463 | 38.540 | 2.338 | 2.445 |
| *Desmodorella* | 0.498 | 1.112 | 0.000 | 0.000 | 0.926 | 1.269 |
| *Desmoscolex* | 6.858 | 3.045 | 0.647 | 0.458 | 10.283 | 6.239 |
| *Dichromadora* | 0.000 | 0.000 | 0.000 | 0.000 | 0.117 | 0.331 |
| *Diplopeltoides* | 1.611 | 1.094 | 0.000 | 0.000 | 1.286 | 0.896 |
| *Diplopeltula* | 0.000 | 0.000 | 0.000 | 0.000 | 0.405 | 0.769 |
| *Draconema* | 0.641 | 0.650 | 0.000 | 0.000 | 1.107 | 1.448 |
| *Eleutherolaimus* | 0.000 | 0.000 | 0.000 | 0.000 | 0.194 | 0.372 |
| *Elzalia* | 0.000 | 0.000 | 0.654 | 0.924 | 1.376 | 1.235 |
| *Endeolophos* | 0.457 | 0.650 | 0.000 | 0.000 | 0.153 | 0.433 |
| *Filitonchus* | 0.000 | 0.000 | 0.000 | 0.000 | 0.250 | 0.706 |
| *Gnomoxyala* | 0.000 | 0.000 | 0.327 | 0.462 | 0.077 | 0.217 |
| *Graphonema* | 0.000 | 0.000 | 0.000 | 0.000 | 0.077 | 0.217 |
| *Greeffiella* | 0.402 | 0.569 | 0.000 | 0.000 | 1.182 | 1.471 |
| *Halalaimus* | 7.731 | 4.072 | 3.268 | 4.622 | 8.488 | 4.962 |
| *Halichoanolaimus* | 0.000 | 0.000 | 0.980 | 1.386 | 0.132 | 0.374 |
| *Haliplectus* | 0.249 | 0.556 | 0.000 | 0.000 | 0.000 | 0.000 |
| *Halomonhystera* | 0.249 | 0.556 | 0.000 | 0.000 | 3.523 | 3.471 |
| *Hapalomus* | 0.427 | 0.956 | 0.000 | 0.000 | 1.155 | 1.915 |
| *Innocuonema* | 0.368 | 0.523 | 0.321 | 0.453 | 1.307 | 1.941 |
| *Karkinochromadora* | 0.194 | 0.433 | 0.000 | 0.000 | 0.000 | 0.000 |
| *Leptolaimus* | 1.203 | 1.014 | 1.307 | 1.849 | 1.313 | 1.274 |
| *Linhomoeus* | 0.000 | 0.000 | 0.327 | 0.462 | 0.195 | 0.375 |
| *Linhystera* | 1.414 | 2.107 | 16.667 | 23.570 | 0.988 | 1.226 |
| *Litinium* | 0.000 | 0.000 | 0.000 | 0.000 | 0.588 | 0.886 |
| *Longicyatholaimus* | 0.198 | 0.444 | 0.327 | 0.462 | 0.270 | 0.511 |
| *Manganonema* | 2.727 | 2.139 | 0.000 | 0.000 | 0.113 | 0.321 |
| *Marylynnia* | 0.000 | 0.000 | 0.980 | 1.386 | 1.135 | 1.081 |
| *Metachromadora* | 0.198 | 0.444 | 0.000 | 0.000 | 0.000 | 0.000 |
| *Metacyatholaimus* | 0.000 | 0.000 | 0.000 | 0.000 | 0.661 | 1.871 |
| *Metadesmolaimus* | 0.935 | 1.395 | 0.000 | 0.000 | 0.077 | 0.217 |
| *Metalinhomoeus* | 2.329 | 3.488 | 0.000 | 0.000 | 0.117 | 0.331 |
| *Metasphaerolaimus* | 0.000 | 0.000 | 0.647 | 0.458 | 0.150 | 0.425 |
| *Microlaimus* | 1.314 | 1.333 | 0.000 | 0.000 | 0.476 | 0.534 |
| *Molgolaimus* | 1.002 | 1.742 | 0.000 | 0.000 | 0.666 | 0.830 |
| *Oncholaimus* | 0.462 | 0.657 | 0.000 | 0.000 | 0.284 | 0.546 |
| *Oxystomina* | 1.746 | 1.054 | 0.000 | 0.000 | 1.056 | 1.350 |
| *Parachromadorita* | 0.000 | 0.000 | 0.327 | 0.462 | 0.230 | 0.650 |
| *Paracomesoma* | 0.000 | 0.000 | 0.327 | 0.462 | 0.420 | 0.601 |
| *Paracyatholaimus* | 0.000 | 0.000 | 0.000 | 0.000 | 0.227 | 0.452 |
| *Paralongicyatholaimus* | 0.392 | 0.555 | 0.000 | 0.000 | 0.377 | 0.850 |
| *Paramicrolaimus* | 0.170 | 0.380 | 0.000 | 0.000 | 0.000 | 0.000 |
| *Paramonohystera* | 0.000 | 0.000 | 0.327 | 0.462 | 0.077 | 0.217 |
| *Pareudesmoscolex* | 3.634 | 1.611 | 0.000 | 0.000 | 3.299 | 5.573 |
| *Parodontophora* | 0.000 | 0.000 | 0.000 | 0.000 | 0.153 | 0.433 |
| *Phanoderma* | 0.000 | 0.000 | 0.000 | 0.000 | 0.118 | 0.334 |
| *Pierrickia* | 0.249 | 0.556 | 0.654 | 0.924 | 1.126 | 1.259 |
| *Polysigma* | 0.498 | 1.112 | 0.000 | 0.000 | 0.000 | 0.000 |
| *Praeacanthonchus* | 0.249 | 0.556 | 0.000 | 0.000 | 0.000 | 0.000 |
| *Prochromadora* | 0.000 | 0.000 | 0.327 | 0.462 | 0.000 | 0.000 |
| *Prochromadorella* | 0.651 | 0.658 | 0.980 | 1.386 | 0.000 | 0.000 |
| *Promonhystera* | 0.000 | 0.000 | 0.000 | 0.000 | 0.077 | 0.217 |
| *Pselionema* | 3.421 | 3.494 | 0.000 | 0.000 | 5.689 | 3.240 |
| *Pseudocella* | 0.214 | 0.478 | 0.000 | 0.000 | 0.000 | 0.000 |
| *Pseudodesmodora* | 0.632 | 0.647 | 0.000 | 0.000 | 1.047 | 0.998 |
| *Retrotheristus* | 0.000 | 0.000 | 0.327 | 0.462 | 0.000 | 0.000 |
| *Richtersia* | 0.000 | 0.000 | 0.000 | 0.000 | 1.105 | 1.974 |
| *Sabatieria* | 0.000 | 0.000 | 0.654 | 0.924 | 2.774 | 2.332 |
| *Scaptrella* | 1.565 | 1.434 | 0.000 | 0.000 | 2.099 | 2.166 |
| *Southerniella* | 0.000 | 0.000 | 0.000 | 0.000 | 0.195 | 0.375 |
| *Sphaerolaimus* | 1.458 | 0.908 | 0.000 | 0.000 | 0.132 | 0.374 |
| *Spiliphera* | 0.000 | 0.000 | 0.000 | 0.000 | 0.077 | 0.217 |
| *Spilophorella* | 0.000 | 0.000 | 0.000 | 0.000 | 0.194 | 0.372 |
| *Spirinia* | 0.000 | 0.000 | 0.000 | 0.000 | 0.113 | 0.321 |
| *Stylotheristus* | 0.208 | 0.466 | 0.000 | 0.000 | 0.000 | 0.000 |
| *Synodontium* | 0.000 | 0.000 | 0.000 | 0.000 | 0.077 | 0.217 |
| *Synonchiella* | 0.000 | 0.000 | 0.000 | 0.000 | 0.113 | 0.321 |
| *Syringolaimus* | 1.191 | 1.367 | 0.000 | 0.000 | 0.349 | 0.687 |
| *Terschellingia* | 0.000 | 0.000 | 0.327 | 0.462 | 0.306 | 0.442 |
| *Thalassomonhystera* | 0.000 | 0.000 | 0.654 | 0.924 | 0.383 | 1.084 |
| *Theristus* | 0.000 | 0.000 | 0.000 | 0.000 | 0.195 | 0.375 |
| *Timmia* | 0.340 | 0.761 | 0.000 | 0.000 | 0.000 | 0.000 |
| *Tricoma* | 9.317 | 4.571 | 0.647 | 0.458 | 18.112 | 8.066 |
| *Trileptium* | 2.488 | 5.562 | 0.000 | 0.000 | 0.000 | 0.000 |
| Unknown1 | 0.000 | 0.000 | 0.000 | 0.000 | 0.112 | 0.317 |
| Unknown2 | 0.000 | 0.000 | 0.000 | 0.000 | 0.227 | 0.641 |
| Unknown3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.113 | 0.321 |
| Unknown4 | 0.000 | 0.000 | 0.000 | 0.000 | 0.113 | 0.321 |
| Unknown5 | 0.208 | 0.466 | 0.000 | 0.000 | 0.000 | 0.000 |
| Unknown6 | 0.249 | 0.556 | 0.000 | 0.000 | 0.000 | 0.000 |
| Unknown7 | 0.000 | 0.000 | 16.667 | 23.570 | 0.000 | 0.000 |
| Unknown8 | 0.194 | 0.433 | 0.000 | 0.000 | 0.000 | 0.000 |
| Unknown9 | 0.000 | 0.000 | 0.000 | 0.000 | 0.300 | 0.849 |
| *Wieseria* | 0.000 | 0.000 | 0.000 | 0.000 | 0.227 | 0.452 |

Table 7: Total abundance (Sum), average (Avg.) and standard deviation (St. dev.) of nematodes of 0-1 cm interval of the morphological samples in the Abyssal, Pockmark and Reference areas.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Area | Station | Core | Abundance | Sum | Avg | St. dev |
| Abyssal | MTB10 | B | 206 | 1641.000 | 273.500 | 202.526 |
| MTB10 | C | 72 |
| MTB13 | A | 272 |
| MTB13 | B | 328 |
| MTB13 | C | 677 |
| MTB10 | A | 86 |
| Pockmark | MTB6 | A | 3 | 3779.000 | 1259.667 | 1369.948 |
| MTB6 | B | 3165 |
| MTB6 | C | 611 |
| Reference | MTB3 | A | 102 | 1091.000 | 181.833 | 82.620 |
| MTB3 | B | 105 |
| MTB3 | C | 183 |
| MTB9 | A | 151 |
| MTB9 | B | 347 |
| MTB9 | C | 203 |

Table 8: Average (Avg.) and standard deviation (St. dev.) for alpha-diversity metrics (Richness, Shannon, Simpson, Rarity) of nematodes of 0-1 cm interval of the morphological samples in the Abyssal, Pockmark and Reference areas.

|  |  |  |  |
| --- | --- | --- | --- |
| Area | Index | Avg. | St. dev. |
| Abyssal | Richness | 24.167 | 3.125 |
| Shannon | 2.715 | 0.169 |
| Simpson | 0.903 | 0.016 |
| Rarity | 0.131 | 0.035 |
| Pockmark | Richness | 13.333 | 15.503 |
| Shannon | 1.170 | 1.161 |
| Simpson | 0.471 | 0.346 |
| Rarity | 0.375 | 0.108 |
| Reference | Richness | 29.778 | 9.654 |
| Shannon | 2.861 | 0.346 |
| Simpson | 0.908 | 0.037 |
| Rarity | 0.190 | 0.099 |

Table 9: Results of statistical testing (p-value) for data normality (Shapiro-Wilk, SW), homoscedasticity (Levene), 1-way analysis of variance (ANOVA), Kruskal-Wallis (Kruskal) and Tukey's HSD (Honestly Significant Difference) for pairwise comparisons of alpha diversity metrics (Richness, Shannon, Simpson, Rarity) of nematodes of 0-1 cm interval of the morphological samples in the Abyssal, Pockmark and Reference areas. Significant values indicated in grey (α=0.05).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Area | Richness | Shannon | Simpson | Rarity |
| SW | Levene | ANOVA | SW | Levene | ANOVA | SW | Levene | Kruskal | SW | Levene | ANOVA |
| Abyssal | 0.0135 | 0.3510 | 0.0517 | 0.1992 | 0.1342 | 0.0005 | 0.7023 | 0.0024 | 0.02100 | 0.4729 | 0.2963 | 0.0034 |
| Pockmark | 0.3093 | 0.3049 | 0.8625 |  | 0.0261 |
| Reference | 0.2952 | 0.9070 | 0.1636 |  | 0.8891 |
| Tukey | Richness | Shannon | Rarity |  |
| Pockmark-Abyssal | 0.252 | 0.002 | 0.003 |
| Reference-Abyssal | 0.497 | 0.848 | 0.413 |
| Reference-Pockmark | 0.043 | 0.000 | 0.013 |

Table 10: Average (Avg.) and standard deviation (St. dev.) for Phylogenetic Diversity (PD) for Nematoda, Genus-assigned, All Unassigned, *Acantholaimus*, *Desmoscolex*, *Halalaimus* and Other Genera ASVs in Abyssal, Pockmark and Reference areas along the sediment vertical profile.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Level | Area | Interval | Avg. | St. dev. |
| Nematoda | Abyssal | 0-1cm | 18.434 | 6.031 |
| 1-2cm | 15.882 | 4.833 |
| 2-3cm | 11.197 | 5.677 |
| 3-4cm | 9.823 | 3.982 |
| 4-5cm | 11.414 | 4.825 |
| Pockmark | 0-1cm | 14.513 | 2.989 |
| 1-2cm | 17.224 | 1.468 |
| 2-3cm | 14.298 | 3.077 |
| 3-4cm | 12.146 | 1.901 |
| 4-5cm | 9.069 | 3.062 |
| Reference | 0-1cm | 22.868 | 6.607 |
| 1-2cm | 19.999 | 7.930 |
| 2-3cm | 17.370 | 6.342 |
| 3-4cm | 16.149 | 4.875 |
| 4-5cm | 12.916 | 4.563 |
| Genus-assigned | Abyssal | 0-1cm | 6.539 | 1.821 |
| 1-2cm | 5.869 | 1.670 |
| 2-3cm | 4.062 | 1.773 |
| 3-4cm | 3.849 | 1.555 |
| 4-5cm | 4.043 | 1.547 |
| Pockmark | 0-1cm | 5.058 | 1.477 |
| 1-2cm | 5.677 | 0.436 |
| 2-3cm | 4.580 | 1.223 |
| 3-4cm | 4.371 | 0.683 |
| 4-5cm | 3.490 | 0.946 |
| Reference | 0-1cm | 7.935 | 1.817 |
| 1-2cm | 7.396 | 2.950 |
| 2-3cm | 6.126 | 2.169 |
| 3-4cm | 5.585 | 1.918 |
| 4-5cm | 4.243 | 1.456 |
| Unassigned | Abyssal | 0-1cm | 12.042 | 4.441 |
| 1-2cm | 9.988 | 3.296 |
| 2-3cm | 7.395 | 4.172 |
| 3-4cm | 6.267 | 2.856 |
| 4-5cm | 7.150 | 3.700 |
| Pockmark | 0-1cm | 9.885 | 1.506 |
| 1-2cm | 11.547 | 1.999 |
| 2-3cm | 9.724 | 1.810 |
| 3-4cm | 7.285 | 1.155 |
| 4-5cm | 5.536 | 2.104 |
| Reference | 0-1cm | 15.171 | 4.753 |
| 1-2cm | 13.054 | 5.549 |
| 2-3cm | 11.505 | 4.646 |
| 3-4cm | 10.763 | 3.338 |
| 4-5cm | 8.742 | 3.002 |
| *Acantholaimus* | Abyssal | 0-1cm | 0.388 | 0.087 |
| 1-2cm | 0.371 | 0.193 |
| 2-3cm | 0.286 | 0.156 |
| 3-4cm | 0.281 | 0.079 |
| 4-5cm | 0.272 | 0.114 |
| Pockmark | 0-1cm | 0.244 | 0.055 |
| 1-2cm | 0.242 | 0.069 |
| 2-3cm | 0.340 | 0.075 |
| 3-4cm | 0.251 | 0.078 |
| 4-5cm | 0.176 | 0.131 |
| Reference | 0-1cm | 0.561 | 0.124 |
| 1-2cm | 0.445 | 0.219 |
| 2-3cm | 0.405 | 0.143 |
| 3-4cm | 0.405 | 0.194 |
| 4-5cm | 0.266 | 0.173 |
| *Desmoscolex* | Abyssal | 0-1cm | 2.097 | 0.694 |
| 1-2cm | 1.837 | 0.647 |
| 2-3cm | 1.206 | 0.569 |
| 3-4cm | 1.087 | 0.521 |
| 4-5cm | 1.330 | 0.521 |
| Pockmark | 0-1cm | 1.223 | 0.520 |
| 1-2cm | 1.317 | 0.093 |
| 2-3cm | 1.144 | 0.551 |
| 3-4cm | 1.196 | 0.636 |
| 4-5cm | 0.846 | 0.265 |
| Reference | 0-1cm | 2.272 | 0.707 |
| 1-2cm | 2.089 | 1.006 |
| 2-3cm | 1.726 | 0.874 |
| 3-4cm | 1.509 | 0.568 |
| 4-5cm | 1.154 | 0.545 |
| *Halalaimus* | Abyssal | 0-1cm | 1.054 | 0.587 |
| 1-2cm | 0.956 | 0.308 |
| 2-3cm | 0.636 | 0.321 |
| 3-4cm | 0.506 | 0.253 |
| 4-5cm | 0.583 | 0.260 |
| Pockmark | 0-1cm | 1.072 | 0.064 |
| 1-2cm | 1.405 | 0.233 |
| 2-3cm | 0.831 | 0.299 |
| 3-4cm | 0.571 | 0.213 |
| 4-5cm | 0.548 | 0.204 |
| Reference | 0-1cm | 1.514 | 0.356 |
| 1-2cm | 1.232 | 0.594 |
| 2-3cm | 1.031 | 0.443 |
| 3-4cm | 0.904 | 0.315 |
| 4-5cm | 0.617 | 0.319 |
| Other Genera | Abyssal | 0-1cm | 3.056 | 0.707 |
| 1-2cm | 2.766 | 0.593 |
| 2-3cm | 1.904 | 0.935 |
| 3-4cm | 2.049 | 0.869 |
| 4-5cm | 1.897 | 0.807 |
| Pockmark | 0-1cm | 2.562 | 0.786 |
| 1-2cm | 3.098 | 0.259 |
| 2-3cm | 2.703 | 0.420 |
| 3-4cm | 2.544 | 0.319 |
| 4-5cm | 1.734 | 0.538 |
| Reference | 0-1cm | 3.695 | 0.960 |
| 1-2cm | 3.766 | 1.416 |
| 2-3cm | 3.177 | 0.973 |
| 3-4cm | 2.797 | 0.980 |
| 4-5cm | 2.177 | 0.532 |

Table 11: Results of statistical testing (p-value) for data normality (Shapiro-Wilk, S-W.Ar./S-W.Int. for Area and Interval, respectively), homoscedasticity (Levene) and 2-way analysis of variance (ANOVA) for Phylogenetic Diversity (PD) in Nematoda, Genus-assigned, Unassigned, *Acantholaimus*, *Desmoscolex*, *Halalaimus* and Other Genera ASVs in the Abyssal, Pockmark and Reference areas along the sediment vertical profile. Significant values indicated in grey (α=0.05).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Level | Area | Interval | S-W.Ar. | S-W.Int. | Levene | ANOVA |
| Nematoda | Pockmark | 0-1cm | 0.451 | 0.915 | Area | Area |
| 1-2cm |  | 0.502 | 0.081 | 0.001 |
| 2-3cm |  | 0.571 | Interval | Interval |
| 3-4cm |  | 0.094 | 0.285 | 0.000 |
| 4-5cm |  | 0.246 | Area\*Interval | Area\*Interval |
| Reference | 0-1cm | 0.630 | 0.307 | 0.617 | 0.814 |
| 1-2cm |  | 0.286 |  | Residuals |
| 2-3cm |  | 0.839 |  | 0.908 |
| 3-4cm |  | 0.440 |  |  |
| 4-5cm |  | 0.290 |  |  |
| Abyssal | 0-1cm | 0.110 | 0.783 |  |  |
| 1-2cm |  | 0.971 |  |  |
| 2-3cm |  | 0.201 |  |  |
| 3-4cm |  | 0.870 |  |  |
| 4-5cm |  | 0.220 |  |  |
| Genus-assigned | Pockmark | 0-1cm | 0.353 | 0.283 | Area | Area |
| 1-2cm |  | 0.950 | 0.020 | 0.002 |
| 2-3cm |  | 0.537 | Interval | Interval |
| 3-4cm |  | 0.984 | 0.352 | 0.000 |
| 4-5cm |  | 0.834 | Area\*Interval | Area\*Interval |
| Reference | 0-1cm | 0.243 | 0.154 | 0.812 | 0.848 |
| 1-2cm |  | 0.131 |  | Residuals |
| 2-3cm |  | 0.890 |  | 0.582 |
| 3-4cm |  | 0.539 |  |  |
| 4-5cm |  | 0.684 |  |  |
| Abyssal | 0-1cm | 0.527 | 0.510 |  |  |
| 1-2cm |  | 0.574 |  |  |
| 2-3cm |  | 0.321 |  |  |
| 3-4cm |  | 0.861 |  |  |
| 4-5cm |  | 0.452 |  |  |
| Unassigned | Pockmark | 0-1cm | 0.847 | 0.732 | Area | Area |
| 1-2cm |  | 0.771 | 0.112 | 0.001 |
| 2-3cm |  | 0.013 | Interval | Interval |
| 3-4cm |  | 0.050 | 0.399 | 0.000 |
| 4-5cm |  | 0.050 | Area\*Interval | Area\*Interval |
| Reference | 0-1cm | 0.827 | 0.697 | 0.552 | 0.906 |
| 1-2cm |  | 0.790 |  | Residuals |
| 2-3cm |  | 0.972 |  | 0.717 |
| 3-4cm |  | 0.540 |  |  |
| 4-5cm |  | 0.556 |  |  |
| Abyssal | 0-1cm | 0.012 | 0.557 |  |  |
| 1-2cm |  | 0.951 |  |  |
| 2-3cm |  | 0.072 |  |  |
| 3-4cm |  | 0.616 |  |  |
| 4-5cm |  | 0.046 |  |  |
| *Acantholaimus* | Pockmark | 0-1cm | 0.844 | 0.196 | Area | Area |
| 1-2cm |  | 0.060 | 0.041 | 0.001 |
| 2-3cm |  | NA | Interval | Interval |
| 3-4cm |  | 0.375 | 0.423 | 0.014 |
| 4-5cm |  | 0.870 | Area\*Interval | Area\*Interval |
| Reference | 0-1cm | 0.752 | 0.924 | 0.511 | 0.651 |
| 1-2cm |  | 0.867 |  | Residuals |
| 2-3cm |  | 0.548 |  | 0.501 |
| 3-4cm |  | 0.408 |  |  |
| 4-5cm |  | 0.671 |  |  |
| Abyssal | 0-1cm | 0.425 | 0.234 |  |  |
| 1-2cm |  | 0.593 |  |  |
| 2-3cm |  | 0.865 |  |  |
| 3-4cm |  | 0.173 |  |  |
| 4-5cm |  | 0.807 |  |  |
| *Desmoscolex* | Pockmark | 0-1cm | 0.398 | 0.186 | Area | Area |
| 1-2cm |  | 0.155 | 0.053 | 0.013 |
| 2-3cm |  | 0.832 | Interval | Interval |
| 3-4cm |  | 0.948 | 0.307 | 0.000 |
| 4-5cm |  | 0.575 | Area\*Interval | Area\*Interval |
| Reference | 0-1cm | 0.319 | 0.382 | 0.696 | 0.721 |
| 1-2cm |  | 0.967 |  | Residuals |
| 2-3cm |  | 0.773 |  | 0.658 |
| 3-4cm |  | 0.815 |  |  |
| 4-5cm |  | 0.460 |  |  |
| Abyssal | 0-1cm | 0.277 | 0.607 |  |  |
| 1-2cm |  | 0.851 |  |  |
| 2-3cm |  | 0.111 |  |  |
| 3-4cm |  | 0.664 |  |  |
| 4-5cm |  | 0.333 |  |  |
| *Halalaimus* | Pockmark | 0-1cm | 0.753 | 0.618 | Area | Area |
| 1-2cm |  | 0.328 | 0.311 | 0.002 |
| 2-3cm |  | 0.511 | Interval | Interval |
| 3-4cm |  | 0.378 | 0.217 | 0.000 |
| 4-5cm |  | 0.753 | Area\*Interval | Area\*Interval |
| Reference | 0-1cm | 0.382 | 0.933 | 0.638 | 0.658 |
| 1-2cm |  | 0.006 |  | Residuals |
| 2-3cm |  | 0.247 |  | 0.067 |
| 3-4cm |  | 0.401 |  |  |
| 4-5cm |  | 0.270 |  |  |
| Abyssal | 0-1cm | 0.003 | 0.282 |  |  |
| 1-2cm |  | 0.682 |  |  |
| 2-3cm |  | 0.409 |  |  |
| 3-4cm |  | 0.430 |  |  |
| 4-5cm |  | 0.236 |  |  |
| Other Genera | Pockmark | 0-1cm | 0.354 | 0.978 | Area | Area |
| 1-2cm |  | 0.413 | 0.022 | 0.001 |
| 2-3cm |  | 0.954 | Interval | Interval |
| 3-4cm |  | 0.656 | 0.390 | 0.000 |
| 4-5cm |  | 0.194 | Area\*Interval | Area\*Interval |
| Reference | 0-1cm | 0.132 | 0.047 | 0.904 | 0.728 |
| 1-2cm |  | 0.103 |  | Residuals |
| 2-3cm |  | 0.274 |  | 0.152 |
| 3-4cm |  | 0.427 |  |  |
| 4-5cm |  | 0.571 |  |  |
| Abyssal | 0-1cm | 0.576 | 0.677 |  |  |
| 1-2cm |  | 0.757 |  |  |
| 2-3cm |  | 0.632 |  |  |
| 3-4cm |  | 0.475 |  |  |
| 4-5cm |  | 0.617 |  |  |

Table 12: Tukey's HSD (Honestly Significant Difference) test results (p-value) for pairwise comparisons of Phylogenetic Diversity (PD) in Nematoda, Genus-assigned, Unassigned, *Acantholaimus*, *Desmoscolex*, *Halalaimus* and Other Genera ASVs in the Abyssal, Pockmark and Reference areas along the sediment vertical profile. Significant values indicated in grey (α=0.05).

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Area | Nematoda | Genus-assigned | Unassigned | *Acantholaimus* | *Desmoscolex* | *Halalaimus* | Other Genera |
| Pockmark-Abyssal | 0.990 | 0.925 | 0.960 | 0.221 | 0.163 | 0.383 | 0.682 |
| Reference-Abyssal | 0.001 | 0.003 | 0.001 | 0.017 | 0.212 | 0.001 | 0.000 |
| Reference-Pockmark | 0.025 | 0.013 | 0.031 | 0.001 | 0.010 | 0.278 | 0.068 |
| Interval |  |  |  |  |  |  |  |
| 1-2cm-0-1cm | 0.865 | 0.963 | 0.795 | 0.860 | 0.936 | 0.952 | 1.000 |
| 2-3cm-0-1cm | 0.025 | 0.017 | 0.052 | 0.331 | 0.036 | 0.012 | 0.099 |
| 3-4cm-0-1cm | 0.002 | 0.004 | 0.004 | 0.239 | 0.008 | 0.000 | 0.058 |
| 4-5cm-0-1cm | 0.000 | 0.000 | 0.001 | 0.008 | 0.003 | 0.000 | 0.001 |
| 2-3cm-1-2cm | 0.224 | 0.089 | 0.448 | 0.884 | 0.199 | 0.073 | 0.108 |
| 3-4cm-1-2cm | 0.035 | 0.024 | 0.072 | 0.785 | 0.060 | 0.002 | 0.064 |
| 4-5cm-1-2cm | 0.009 | 0.002 | 0.024 | 0.104 | 0.028 | 0.000 | 0.001 |
| 3-4cm-2-3cm | 0.916 | 0.982 | 0.861 | 0.999 | 0.978 | 0.724 | 0.999 |
| 4-5cm-2-3cm | 0.702 | 0.637 | 0.637 | 0.550 | 0.919 | 0.422 | 0.395 |
| 4-5cm-3-4cm | 0.993 | 0.923 | 0.995 | 0.705 | 0.999 | 0.991 | 0.574 |

Table 13: Results of statistical testing (p-value) for analysis of multivariate homogeneity of group dispersions (PERMDISP) and 2-way permutational analysis of variance (PERMANOVA) for unweighted UniFrac distances in Nematoda, Unassigned, Genus-assigned, *Acantholaimus*, *Desmoscolex* and *Halalaimus* ASVs in the Abyssal, Pockmark and Reference areas along the sediment vertical profile. Significant values indicated in grey (α=0.05).

|  |  |  |
| --- | --- | --- |
| Level | PERMDISP | PERMANOVA |
| Area | Intervals | Area | Interval | Area\*Interval |
| Nematoda | 0.004 | 0.668 | 0.000 | 0.000 | 0.001 |
| Unassigned | 0.000 | 0.859 | 0.000 | 0.000 | 0.006 |
| Genus-assigned | 0.211 | 0.727 | 0.000 | 0.000 | 0.366 |
| *Acantholaimus* | 0.174 | 0.847 | 0.000 | 0.013 | 0.107 |
| *Desmoscolex* | 0.372 | 0.550 | 0.000 | 0.000 | 0.125 |
| *Halalaimus* | 0.167 | 0.754 | 0.000 | 0.000 | 0.016 |
| Other Genera | 0.000 | 0.104 | 0.000 | 0.000 | 0.001 |

Table 14: Results (p-value) of pairwise comparisons between group levels with Bonferroni corrections for multiple testing of unweighted UniFrac distances in Nematoda, Genus-assigned, *Acantholaimus* and *Desmoscolex* ASVs in the Abyssal, Pockmark and Reference areas along the sediment vertical profile. Significant values indicated in grey (α=0.05).

|  |  |
| --- | --- |
| Groups | Level |
| Genus-assigned | *Acantholaimus* | *Desmoscolex* |
| Area |
| Abyssal-Pockmark | 0.012 | 0.002 | 0.000 |
| Abyssal-Reference | 0.000 | 0.001 | 0.001 |
| Pockmark-Reference | 0.014 | 0.001 | 0.000 |
| Interval |
| 1-2cm-0-1cm |  | 1.000 | 0.916 |
| 2-3cm-0-1cm |  | 1.000 | 0.004 |
| 3-4cm-0-1cm |  | 0.389 | 0.006 |
| 4-5cm-0-1cm |  | 0.017 | 0.004 |
| 2-3cm-1-2cm |  | 1.000 | 0.990 |
| 3-4cm-1-2cm |  | 1.000 | 0.038 |
| 4-5cm-1-2cm |  | 0.388 | 0.006 |
| 3-4cm-2-3cm |  | 1.000 | 1.000 |
| 4-5cm-2-3cm |  | 0.458 | 1.000 |
| 4-5cm-3-4cm |  | 1.000 | 1.000 |

Table 15: Observed, simulated mean and variance, lower/upper-tail p-values (2-tailed t-test) and standardized effect size (ses) for checkerboard pairs (CPs) and C-score for *Acantholaimus*, *Desmoscolex* and *Halalaimus* ASVs in the Abyssal, Pockmark and Reference areas. Significant values indicated in grey (α=0.05).

|  |  |  |  |
| --- | --- | --- | --- |
| CPs | *Acantholaimus* | *Desmoscolex* | *Halalaimus* |
| Abyssal | Pockmark | Reference | Abyssal | Pockmark | Reference | Abyssal | Pockmark | Reference |
| Observed | 69665 | 1134 | 76593 | 544045 | 13625 | 552285 | 85724 | 3133 | 101639 |
| Simulated Mean | 71612 | 1118 | 78237 | 558188 | 13688 | 564108 | 88324 | 3128.1 | 103150 |
| Simulated Variance | 10252 | 423.51 | 13739 | 82503 | 5196.1 | 96778 | 14041 | 1152.7 | 20779 |
| Lower-tail P | 0.000 | 0.821 | 0.000 | 0.000 | 0.154 | 0.000 | 0.000 | 0.436 | 0.000 |
| Upper-tail P | 1.000 | 0.227 | 1.000 | 1.000 | 0.848 | 1.000 | 1.000 | 0.580 | 1.000 |
| Observed metric> | 0 | 7726 | 0 | 0 | 1525 | 0 | 0 | 4202 | 0 |
| Observed metric < | 10000 | 1791 | 10000 | 10000 | 8460 | 10000 | 10000 | 5643 | 10000 |
| Observed metric = | 0 | 483 | 0 | 0 | 15 | 0 | 0 | 155 | 0 |
| SES | -19.233 | 0.778 | -14.027 | -49.239 | -0.875 | -38.004 | -21.943 | 0.145 | -10.484 |
| C-score |  |
| Observed | 1.038 | 0.614 | 1.269 | 1.092 | 0.605 | 1.229 | 1.166 | 0.518 | 1.406 |
| Simulated Mean | 1.083 | 0.606 | 1.329 | 1.137 | 0.609 | 1.281 | 1.218 | 0.516 | 1.472 |
| Simulated Variance | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Lower-tail P | 0.000 | 0.746 | 0.000 | 0.000 | 0.130 | 0.000 | 0.000 | 0.496 | 0.000 |
| Upper-tail P | 1.000 | 0.292 | 1.000 | 1.000 | 0.871 | 1.000 | 1.000 | 0.525 | 1.000 |
| Observed metric> | 0 | 7083 | 0 | 0 | 1289 | 0 | 0 | 4750 | 0 |
| Observed metric < | 10000 | 2543 | 10000 | 10000 | 8705 | 10000 | 10000 | 5038 | 10000 |
| Observed metric = | 0 | 374 | 0 | 0 | 6 | 0 | 0 | 212 | 0 |
| SES | -16.541 | 0.652 | -16.940 | -48.137 | -1.041 | -44.171 | -21.293 | 0.251 | -19.120 |

Table 16: Observed, simulated mean and variance, lower/upper-tail p-values (2-tailed t-test) and standardized effect size (ses) for checkerboard pairs (CPs) and C-score for *Acantholaimus*, *Desmoscolex* and *Halalaimus* ASVs in the Abyssal, Pockmark and Reference areas along the sediment vertical profile. Significant values indicated in grey (α=0.05).

|  |
| --- |
| **Abyssal** |
| **CPs** | Acantholaimus.0-1cm | Acantholaimus.1-2cm | Acantholaimus.2-3cm | Acantholaimus.3-4cm | Acantholaimus.4-5cm | Desmoscolex.0-1cm | Desmoscolex.1-2cm | Desmoscolex.2-3cm | Desmoscolex.3-4cm | Desmoscolex.4-5cm | Halalaimus.0-1cm | Halalaimus.1-2cm | Halalaimus.2-3cm | Halalaimus.3-4cm | Halalaimus.4-5cm |
| Observed | 5057.000 | 7356.000 | 3254.000 | 2256.000 | 2590.000 | 47402.000 | 57296.000 | 22786.000 | 16124.000 | 22766.000 | 8954.000 | 11717.000 | 3600.000 | 2772.000 | 3543.000 |
| Simulated\_mean | 5080.200 | 7813.000 | 3506.100 | 2333.900 | 2718.000 | 49303.000 | 59276.000 | 24683.000 | 16712.000 | 24087.000 | 9724.400 | 11871.000 | 3822.000 | 2797.100 | 3609.800 |
| Simulated\_variance | 814.840 | 1097.000 | 478.800 | 341.540 | 360.900 | 8098.300 | 8345.000 | 3149.400 | 2175.400 | 2974.400 | 1653.200 | 1539.700 | 480.700 | 384.710 | 427.300 |
| Lower-tail P | 0.192 | 0.000 | 0.000 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.003 | 0.000 | 0.110 | 0.008 |
| Upper-tail P | 0.815 | 1.000 | 1.000 | 0.999 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 0.997 | 1.000 | 0.897 | 0.993 |
| Observed metric> | 1849.000 | 0.000 | 0.000 | 14.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 32.000 | 0.000 | 1029.000 | 72.000 |
| Observed metric < | 8083.000 | 10000.000 | 10000.000 | 9986.000 | 10000.000 | 10000.000 | 10000.000 | 10000.000 | 10000.000 | 10000.000 | 10000.000 | 9968.000 | 10000.000 | 8901.000 | 9921.000 |
| Observed metric = | 68.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 70.000 | 7.000 |
| SES | -0.814 | -13.798 | -11.523 | -4.217 | -6.736 | -21.120 | -21.679 | -33.805 | -12.598 | -24.227 | -18.949 | -3.934 | -10.125 | -1.277 | -3.232 |
| **C-score** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Observed | 1.077 | 1.017 | 0.938 | 0.965 | 1.001 | 1.004 | 1.034 | 0.915 | 0.973 | 0.947 | 1.033 | 1.000 | 0.916 | 1.027 | 0.913 |
| Simulated\_mean | 1.090 | 1.101 | 1.046 | 0.998 | 1.044 | 1.080 | 1.092 | 1.006 | 1.020 | 1.001 | 1.157 | 1.016 | 0.976 | 1.037 | 0.933 |
| Simulated\_variance | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Lower-tail P | 0.120 | 0.000 | 0.000 | 0.013 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.003 | 0.000 | 0.143 | 0.006 |
| Upper-tail P | 0.882 | 1.000 | 1.000 | 0.988 | 0.999 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 0.997 | 1.000 | 0.864 | 0.995 |
| Observed metric> | 1181.000 | 0.000 | 0.000 | 118.000 | 10.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 30.000 | 0.000 | 1364.000 | 55.000 |
| Observed metric < | 8804.000 | 10000.000 | 10000.000 | 9871.000 | 9990.000 | 10000.000 | 10000.000 | 10000.000 | 10000.000 | 10000.000 | 10000.000 | 9970.000 | 10000.000 | 8568.000 | 9942.000 |
| Observed metric = | 15.000 | 0.000 | 0.000 | 11.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 68.000 | 3.000 |
| SES | -1.201 | -10.409 | -10.898 | -2.816 | -4.342 | -24.722 | -23.800 | -30.960 | -12.745 | -18.335 | -19.289 | -3.766 | -9.324 | -1.058 | -3.493 |
| **Pockmark** |
| **CPs** | Acantholaimus.0-1cm | Acantholaimus.1-2cm | Acantholaimus.2-3cm | Acantholaimus.3-4cm | Acantholaimus.4-5cm | Desmoscolex.0-1cm | Desmoscolex.1-2cm | Desmoscolex.2-3cm | Desmoscolex.3-4cm | Desmoscolex.4-5cm | Halalaimus.0-1cm | Halalaimus.1-2cm | Halalaimus.2-3cm | Halalaimus.3-4cm | Halalaimus.4-5cm |
| Observed | 68.000 | 61.000 | 54.000 | 64.000 | 86.000 | 805.000 | 1111.000 | 658.000 | 507.000 | 611.000 | 493.000 | 514.000 | 188.000 | 80.000 | 67.000 |
| Simulated\_mean | 65.379 | 60.588 | 52.465 | 65.427 | 113.840 | 900.350 | 1099.600 | 779.940 | 582.850 | 645.320 | 503.710 | 530.270 | 208.170 | 80.050 | 69.926 |
| Simulated\_variance | 22.470 | 20.803 | 26.217 | 22.778 | 39.874 | 321.410 | 427.120 | 297.740 | 227.070 | 217.050 | 203.270 | 205.570 | 76.511 | 26.142 | 26.366 |
| Lower-tail P | 0.728 | 0.509 | 0.605 | 0.312 | 0.005 | 0.002 | 0.661 | 0.000 | 0.003 | 0.038 | 0.179 | 0.120 | 0.036 | 0.404 | 0.210 |
| Upper-tail P | 0.481 | 0.645 | 0.692 | 0.784 | 0.998 | 0.999 | 0.366 | 1.000 | 0.998 | 0.965 | 0.833 | 0.888 | 0.970 | 0.659 | 0.812 |
| Observed metric> | 5186.000 | 3553.000 | 3078.000 | 2163.000 | 22.000 | 14.000 | 6342.000 | 0.000 | 25.000 | 350.000 | 1673.000 | 1117.000 | 300.000 | 3413.000 | 1877.000 |
| Observed metric < | 2719.000 | 4912.000 | 3951.000 | 6876.000 | 9947.000 | 9984.000 | 3393.000 | 10000.000 | 9974.000 | 9618.000 | 8215.000 | 8796.000 | 9640.000 | 5962.000 | 7901.000 |
| Observed metric = | 2095.000 | 1535.000 | 2971.000 | 961.000 | 31.000 | 2.000 | 265.000 | 0.000 | 1.000 | 32.000 | 112.000 | 87.000 | 60.000 | 625.000 | 222.000 |
| SES | 0.553 | 0.090 | 0.300 | -0.299 | -4.409 | -5.319 | 0.550 | -7.067 | -5.034 | -2.330 | -0.751 | -1.135 | -2.306 | -0.010 | -0.570 |
| **C-score** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Observed | 0.714 | 0.581 | 0.353 | 0.558 | 0.503 | 0.560 | 0.655 | 0.525 | 0.581 | 0.625 | 0.570 | 0.486 | 0.467 | 0.421 | 0.537 |
| Simulated\_mean | 0.667 | 0.578 | 0.343 | 0.584 | 0.667 | 0.620 | 0.645 | 0.642 | 0.667 | 0.667 | 0.581 | 0.515 | 0.538 | 0.421 | 0.588 |
| Simulated\_variance | 0.003 | 0.002 | 0.001 | 0.002 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | 0.001 | 0.002 |
| Lower-tail P | 0.957 | 0.501 | 0.610 | 0.243 | 0.005 | 0.003 | 0.826 | 0.000 | 0.005 | 0.031 | 0.207 | 0.057 | 0.026 | 0.411 | 0.148 |
| Upper-tail P | 0.272 | 0.651 | 0.698 | 0.818 | 0.998 | 0.997 | 0.217 | 1.000 | 0.995 | 0.975 | 0.802 | 0.946 | 0.981 | 0.653 | 0.872 |
| Observed metric> | 7280.000 | 3491.000 | 3016.000 | 1817.000 | 25.000 | 33.000 | 7826.000 | 2.000 | 46.000 | 254.000 | 1980.000 | 536.000 | 189.000 | 3473.000 | 1284.000 |
| Observed metric < | 429.000 | 4994.000 | 3904.000 | 7567.000 | 9946.000 | 9966.000 | 1742.000 | 9998.000 | 9953.000 | 9688.000 | 7926.000 | 9429.000 | 9740.000 | 5895.000 | 8524.000 |
| Observed metric = | 2291.000 | 1515.000 | 3080.000 | 616.000 | 29.000 | 1.000 | 432.000 | 0.000 | 1.000 | 58.000 | 94.000 | 35.000 | 71.000 | 632.000 | 192.000 |
| SES | 0.879 | 0.063 | 0.295 | -0.536 | -4.538 | -4.451 | 0.758 | -7.134 | -4.236 | -2.600 | -0.591 | -1.845 | -2.722 | 0.006 | -1.030 |
| **Reference** |
| **CPs** | Acantholaimus.0-1cm | Acantholaimus.1-2cm | Acantholaimus.2-3cm | Acantholaimus.3-4cm | Acantholaimus.4-5cm | Desmoscolex.0-1cm | Desmoscolex.1-2cm | Desmoscolex.2-3cm | Desmoscolex.3-4cm | Desmoscolex.4-5cm | Halalaimus.0-1cm | Halalaimus.1-2cm | Halalaimus.2-3cm | Halalaimus.3-4cm | Halalaimus.4-5cm |
| Observed | 4361.000 | 2705.000 | 2281.000 | 1661.000 | 1131.000 | 28484.000 | 25713.000 | 15053.000 | 9250.000 | 6582.000 | 7478.000 | 4911.000 | 3417.000 | 2253.000 | 937.000 |
| Simulated\_mean | 4507.900 | 2984.300 | 2419.200 | 1817.500 | 1255.400 | 29810.000 | 27822.000 | 16373.000 | 9678.900 | 7114.000 | 7771.400 | 5373.000 | 3691.800 | 2479.900 | 1086.300 |
| Simulated\_variance | 989.900 | 724.280 | 561.240 | 438.070 | 229.610 | 6272.300 | 6386.500 | 3281.000 | 2254.500 | 1347.100 | 1853.300 | 1432.700 | 955.670 | 623.500 | 208.370 |
| Lower-tail P | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Upper-tail P | 0.999 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| Observed metric> | 13.000 | 0.000 | 3.000 | 1.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Observed metric < | 9987.000 | 10000.000 | 9997.000 | 9999.000 | 10000.000 | 10000.000 | 10000.000 | 10000.000 | 10000.000 | 10000.000 | 10000.000 | 10000.000 | 10000.000 | 10000.000 | 10000.000 |
| Observed metric = | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| SES | -4.669 | -10.379 | -5.834 | -7.477 | -8.212 | -16.744 | -26.396 | -23.049 | -9.033 | -14.494 | -6.816 | -12.206 | -8.890 | -9.087 | -10.342 |
| **C-score** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Observed | 0.941 | 0.898 | 0.900 | 0.793 | 0.794 | 0.912 | 0.918 | 0.854 | 0.824 | 0.826 | 0.991 | 0.981 | 1.025 | 0.841 | 0.840 |
| Simulated\_mean | 1.007 | 1.059 | 1.030 | 0.892 | 0.875 | 0.976 | 1.025 | 0.959 | 0.886 | 0.897 | 1.077 | 1.178 | 1.169 | 0.949 | 0.957 |
| Simulated\_variance | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Lower-tail P | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Upper-tail P | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| Observed metric> | 1.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Observed metric < | 9999.000 | 10000.000 | 10000.000 | 10000.000 | 9999.000 | 10000.000 | 10000.000 | 10000.000 | 10000.000 | 10000.000 | 10000.000 | 10000.000 | 10000.000 | 10000.000 | 10000.000 |
| Observed metric = | 0.000 | 0.000 | 0.000 | 0.000 | 1.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| SES | -6.394 | -10.894 | -8.030 | -7.569 | -6.537 | -16.692 | -25.873 | -22.534 | -11.079 | -13.456 | -9.298 | -16.756 | -10.637 | -8.714 | -7.164 |

Table 17: Statistical testing of normality (Shapiro-Wilk, S-W) and non-zero means (t-test) for standardised effect size of Phylogenetic Diversity (ses.PD), Mean Pairwise Distance (ses.MPD) and Mean Nearest Taxon Distance (ses.MNTD) for Nematoda, Genus-assigned, Unassigned, *Acantholaimus*, *Desmoscolex*, *Halalaimus* and Other Genera ASVs in the Abyssal, Pockmark and Reference areas. Non-parametric equivalents (Wilcoxon signed-rank test, Wilcox) used when normality assumption was violated. Significant values indicated in grey (α=0.05).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Level | Area | ses.PD | ses.MNTD | ses.MPD |
| S-W | t.test | Wilcox | S-W | t.test | Wilcox | S-W | t.test | Wilcox |
| Nematoda | Pockmark | 0.478 | 0.000 |  | 0.992 | 0.000 |  | 0.148 | 0.000 |  |
| Reference | 0.419 | 0.000 |  | 0.398 | 0.000 |  | 0.920 | 0.000 |  |
| Abyssal | 0.954 | 0.000 |  | 0.939 | 0.000 |  | 0.000 |  | 0.000 |
| Genus-assigned | Pockmark | 0.139 | 0.000 |  | 0.475 | 0.000 |  | 0.083 | 0.014 |  |
| Reference | 0.829 | 0.000 |  | 0.231 | 0.000 |  | 0.029 |  | 0.000 |
| Abyssal | 0.059 | 0.000 |  | 0.210 | 0.000 |  | 0.003 | 0.000 | 0.000 |
| Unassigned | Pockmark | 0.510 | 0.000 |  | 0.992 | 0.000 |  | 0.903 | 0.000 |  |
| Reference | 0.078 | 0.000 |  | 0.398 | 0.000 |  | 0.045 |  | 0.000 |
| Abyssal | 0.913 | 0.000 |  | 0.939 | 0.000 |  | 0.703 | 0.001 |  |
| *Acantholaimus* | Pockmark | 0.970 | 0.651 |  | 0.872 | 0.952 |  | 0.310 | 0.317 |  |
| Reference | 0.062 | 0.017 |  | 0.058 | 0.002 |  | 0.170 | 0.144 |  |
| Abyssal | 0.000 |  | 0.000 | 0.000 |  | 0.000 | 0.250 | 0.000 |  |
| *Desmoscolex* | Pockmark | 0.228 | 0.738 |  | 0.718 | 0.497 |  | 0.331 | 0.333 |  |
| Reference | 0.763 | 0.001 |  | 0.664 | 0.004 |  | 0.989 | 0.002 |  |
| Abyssal | 0.377 | 0.000 |  | 0.762 | 0.000 |  | 0.946 | 0.000 |  |
| *Halalaimus* | Pockmark | 0.894 | 0.688 |  | 0.036 |  | 0.071 | 0.356 | 0.194 |  |
| Reference | 0.184 | 0.000 |  | 0.047 |  | 0.000 | 0.651 | 0.000 |  |
| Abyssal | 0.320 | 0.000 |  | 0.246 | 0.000 |  | 0.166 | 0.000 |  |
| Other Genera | Pockmark | 0.404 | 0.014 |  | 0.293 | 0.004 |  | 0.517 | 0.180 |  |
| Reference | 0.162 | 0.000 |  | 0.581 | 0.001 |  | 0.141 | 0.046 |  |
| Abyssal | 0.039 |  | 0.000 | 0.065 | 0.000 |  | 0.157 | 0.033 |  |

Table 18: Statistical testing of normality (Shapiro-Wilk, S-W) and non-zero means (t-test) for standardised effect size of Phylogenetic Diversity (ses.PD), Mean Pairwise Distance (ses.MPD) and Mean Nearest Taxon Distance (ses.MNTD) for Nematoda, Genus-assigned, Unassigned, *Acantholaimus*, *Desmoscolex*, and *Halalaimus* ASVs in the Abyssal, Pockmark and Reference areas per 1 cm intervals. Non-parametric equivalents (Wilcoxon signed-rank test, Wilcox) used when normality assumption was violated. Significant values indicated in grey (α=0.05).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Level | Area | Interval | ses.PD | ses.MNTD | ses.MPD |
| S-W | t.test | Wilcox | S-W | t.test | Wilcox | S-W | t.test | Wilcox |
| Nematoda | Pockmark | 0-1cm | 0.1002 | 0.1695 |  | 0.1806 | 0.0995 |  | 0.9394 | 0.0780 |  |
| 1-2cm | 0.6830 | 0.1047 |  | 0.5914 | 0.2163 |  | 0.5883 | 0.0812 |  |
| 2-3cm | 0.3569 | 0.0072 |  | 0.2635 | 0.0273 |  | 0.9901 | 0.0237 |  |
| 3-4cm | 0.8513 | 0.0005 |  | 0.9275 | 0.0074 |  | 0.9116 | 0.0099 |  |
| 4-5cm | 0.2253 | 0.0254 |  | 0.3621 | 0.0462 |  | 0.7303 | 0.0160 |  |
| Reference | 0-1cm | 0.2429 | 0.0793 |  | 0.0711 | 0.0535 |  | 0.1335 | 0.6885 |  |
| 1-2cm | 0.1480 | 0.0001 |  | 0.4651 | 0.0003 |  | 0.0006 |  | 0.0000 |
| 2-3cm | 0.2675 | 0.0076 |  | 0.2672 | 0.0048 |  | 0.9038 | 0.0300 |  |
| 3-4cm | 0.1330 | 0.0133 |  | 0.2366 | 0.0135 |  | 0.8991 | 0.0233 |  |
| 4-5cm | 0.2402 | 0.0003 |  | 0.7615 | 0.0000 |  | 0.0030 |  | 0.0000 |
| Abyssal | 0-1cm | 0.9768 | 0.0166 |  | 0.9764 | 0.0039 |  | 0.0091 |  | 0.0007 |
| 1-2cm | 0.4991 | 0.0011 |  | 0.3695 | 0.0008 |  | 0.0257 |  | 0.0000 |
| 2-3cm | 0.4323 | 0.0002 |  | 0.8063 | 0.0001 |  | 0.2586 | 0.0112 |  |
| 3-4cm | 0.8022 | 0.0000 |  | 0.8040 | 0.0001 |  | 0.7358 | 0.0005 |  |
| 4-5cm | 0.3596 | 0.0003 |  | 0.5872 | 0.0001 |  | 0.0293 |  | 0.0000 |
| Genus-assigned | Pockmark | 0-1cm | 0.1913 | 0.2295 |  | 0.1822 | 0.0726 |  | 0.5940 | 0.1854 |  |
| 1-2cm | 0.7476 | 0.2884 |  | 0.5187 | 0.3289 |  | 0.4752 | 0.2888 |  |
| 2-3cm | 0.6349 | 0.2256 |  | 0.9843 | 0.2385 |  | 0.9137 | 0.3249 |  |
| 3-4cm | 0.8504 | 0.0088 |  | 0.7777 | 0.0054 |  | 0.0485 |  | 0.0039 |
| 4-5cm | 0.1143 | 0.3113 |  | 0.1157 | 0.1092 |  | 0.4206 | 0.8520 |  |
| Reference | 0-1cm | 0.0802 | 0.5646 |  | 0.2306 | 0.7440 |  | 0.6292 | 0.0014 |  |
| 1-2cm | 0.7849 | 0.2985 |  | 0.2734 | 0.2129 |  | 0.6672 | 0.6482 |  |
| 2-3cm | 0.8350 | 0.0007 |  | 0.1854 | 0.0002 |  | 0.9969 | 0.0004 |  |
| 3-4cm | 0.5133 | 0.0143 |  | 0.9630 | 0.0311 |  | 0.1598 | 0.0021 |  |
| 4-5cm | 0.7324 | 0.0011 |  | 0.7329 | 0.0023 |  | 0.1525 | 0.0020 |  |
| Abyssal | 0-1cm | 0.6587 | 0.0369 |  | 0.5111 | 0.0457 |  | 0.1899 | 0.1605 |  |
| 1-2cm | 0.1535 | 0.0125 |  | 0.3392 | 0.0097 |  | 0.4458 | 0.0061 |  |
| 2-3cm | 0.8157 | 0.0258 |  | 0.1446 | 0.0181 |  | 0.1720 | 0.4012 |  |
| 3-4cm | 0.4646 | 0.0006 |  | 0.8597 | 0.0002 |  | 0.5454 | 0.0048 |  |
| 4-5cm | 0.4333 | 0.0949 |  | 0.2319 | 0.1173 |  | 0.0989 | 0.1863 |  |
| Unassigned | Pockmark | 0-1cm | 0.9040 | 0.0044 |  | 0.1806 | 0.0995 |  | 0.3363 | 0.0186 |  |
| 1-2cm | 0.9690 | 0.0666 |  | 0.5914 | 0.2163 |  | 0.9071 | 0.0044 |  |
| 2-3cm | 0.9579 | 0.0061 |  | 0.2635 | 0.0273 |  | 0.1204 | 0.0082 |  |
| 3-4cm | 0.6999 | 0.0045 |  | 0.9275 | 0.0074 |  | 0.2949 | 0.0065 |  |
| 4-5cm | 0.5070 | 0.0110 |  | 0.3621 | 0.0462 |  | 0.2871 | 0.0312 |  |
| Reference | 0-1cm | 0.4791 | 0.2194 |  | 0.0711 | 0.0535 |  | 0.4322 | 0.0460 |  |
| 1-2cm | 0.2727 | 0.0018 |  | 0.4651 | 0.0003 |  | 0.2178 | 0.0053 |  |
| 2-3cm | 0.6045 | 0.1157 |  | 0.2672 | 0.0048 |  | 0.0062 |  | 0.0005 |
| 3-4cm | 0.2894 | 0.0275 |  | 0.2366 | 0.0135 |  | 0.2992 | 0.0205 |  |
| 4-5cm | 0.9767 | 0.0007 |  | 0.7615 | 0.0000 |  | 0.6335 | 0.0134 |  |
| Abyssal | 0-1cm | 0.9173 | 0.0687 |  | 0.9764 | 0.0039 |  | 0.4826 | 0.0950 |  |
| 1-2cm | 0.7570 | 0.0269 |  | 0.3695 | 0.0008 |  | 0.3951 | 0.0338 |  |
| 2-3cm | 0.2605 | 0.0333 |  | 0.8063 | 0.0001 |  | 0.5790 | 0.2491 |  |
| 3-4cm | 0.9420 | 0.0000 |  | 0.8040 | 0.0001 |  | 0.9549 | 0.0003 |  |
| 4-5cm | 0.8355 | 0.0056 |  | 0.5872 | 0.0001 |  | 0.5195 | 0.0416 |  |
| *Acantholaimus* | Pockmark | 0-1cm | 0.8990 | 0.6106 |  | 0.5765 | 0.7223 |  | 0.8947 | 0.7797 |  |
| 1-2cm | 0.7889 | 0.6738 |  | 0.9770 | 0.2510 |  | 0.1644 | 0.5264 |  |
| 2-3cm |  |  | 1.0000 |  |  | 1.0000 |  |  | 0.5000 |
| 3-4cm | 0.7454 | 0.9715 |  | 0.8220 | 0.6651 |  | 0.2797 | 0.7071 |  |
| 4-5cm | 0.9329 | 0.0792 |  | 0.7122 | 0.0201 |  | 0.7966 | 0.0834 |  |
| Reference | 0-1cm | 0.7407 | 0.5642 |  | 0.3503 | 0.8134 |  | 0.9586 | 0.3785 |  |
| 1-2cm | 0.0438 | 0.0142 |  | 0.3697 | 0.0067 |  | 0.4413 | 0.0849 |  |
| 2-3cm |  |  | 0.0625 |  |  | 0.0313 |  |  | 0.0938 |
| 3-4cm | 0.4803 | 0.6202 |  | 0.1308 | 0.4910 |  | 0.5277 | 0.3252 |  |
| 4-5cm | 0.1746 | 0.0651 |  | 0.0296 | 0.1171 |  | 0.7046 | 0.0417 |  |
| Abyssal | 0-1cm | 0.5428 | 0.0001 |  | 0.2727 | 0.0001 |  | 0.6628 | 0.0105 |  |
| 1-2cm | 0.7196 | 0.0009 |  | 0.7741 | 0.0010 |  | 0.8556 | 0.0105 |  |
| 2-3cm |  | 0.0775 | 0.1289 |  | 0.1751 | 0.1953 |  |  | 0.1094 |
| 3-4cm | 0.5022 | 0.0026 |  | 0.7585 | 0.0213 |  | 0.4796 | 0.0146 |  |
| 4-5cm | 0.1338 | 0.0273 |  | 0.2310 | 0.0003 |  | 0.6083 | 0.0028 |  |
| *Desmoscolex* | Pockmark | 0-1cm | 0.4989 | 0.9260 |  | 0.0314 | 0.7656 |  | 0.8047 | 0.1834 |  |
| 1-2cm | 0.2429 | 0.5978 |  | 0.5318 | 0.3161 |  | 0.1491 | 0.4621 |  |
| 2-3cm | 0.6711 | 0.3860 |  | 0.3735 | 0.3114 |  | 0.4976 | 0.2124 |  |
| 3-4cm | 0.5740 | 0.6356 |  | 0.9365 | 0.9785 |  | 0.2604 | 0.5120 |  |
| 4-5cm | 0.2888 | 0.0304 |  | 0.6003 | 0.0360 |  | 0.9680 | 0.5453 |  |
| Reference | 0-1cm | 0.7983 | 0.0513 |  | 0.9221 | 0.0506 |  | 0.9390 | 0.2426 |  |
| 1-2cm | 0.5103 | 0.0358 |  | 0.5330 | 0.0437 |  | 0.9913 | 0.0143 |  |
| 2-3cm | 0.0134 | 0.1610 |  | 0.1113 | 0.7051 |  | 0.6983 | 0.1133 |  |
| 3-4cm | 0.4090 | 0.0052 |  | 0.1479 | 0.0264 |  | 0.8777 | 0.0456 |  |
| 4-5cm | 0.2699 | 0.0532 |  | 0.2838 | 0.1338 |  | 0.9216 | 0.1530 |  |
| Abyssal | 0-1cm | 0.7221 | 0.3946 |  | 0.3805 | 0.1995 |  | 0.5864 | 0.2026 |  |
| 1-2cm | 0.4354 | 0.0084 |  | 0.6652 | 0.0131 |  | 0.9817 | 0.0341 |  |
| 2-3cm | 0.0269 | 0.0385 |  | 0.3853 | 0.0337 |  | 0.2466 | 0.0306 |  |
| 3-4cm | 0.1890 | 0.0003 |  | 0.0169 | 0.0020 |  | 0.8529 | 0.0264 |  |
| 4-5cm | 0.2662 | 0.1943 |  | 0.3508 | 0.1031 |  | 0.9769 | 0.7611 |  |
| *Halalaimus* | Pockmark | 0-1cm | 0.5459 | 0.8034 |  | 0.3134 | 0.0322 |  | 0.9925 | 0.3630 |  |
| 1-2cm | 0.6667 | 0.0799 |  | 0.7511 | 0.5758 |  | 0.1620 | 0.5020 |  |
| 2-3cm | 0.3301 | 0.9028 |  | 0.0610 | 0.1291 |  | 0.3105 | 0.7861 |  |
| 3-4cm | 0.8510 | 0.2603 |  | 0.0609 | 0.1997 |  | 0.7191 | 0.2506 |  |
| 4-5cm | 0.1492 | 0.8718 |  | 0.0487 | 0.5094 |  | 0.4930 | 0.7603 |  |
| Reference | 0-1cm | 0.1973 | 0.0578 |  | 0.8890 | 0.0062 |  | 0.5998 | 0.6547 |  |
| 1-2cm | 0.7000 | 0.0007 |  | 0.6601 | 0.0337 |  | 0.2905 | 0.0116 |  |
| 2-3cm | 0.5435 | 0.0019 |  | 0.7845 | 0.0086 |  | 0.9926 | 0.0061 |  |
| 3-4cm | 0.7650 | 0.1046 |  | 0.9774 | 0.2148 |  | 0.3777 | 0.2167 |  |
| 4-5cm | 0.5057 | 0.6834 |  | 0.6107 | 0.7825 |  | 0.6906 | 0.7588 |  |
| Abyssal | 0-1cm | 0.3430 | 0.0157 |  | 0.4272 | 0.0136 |  | 0.0678 | 0.0153 |  |
| 1-2cm | 0.4750 | 0.0116 |  | 0.0469 | 0.0000 |  | 0.5673 | 0.0151 |  |
| 2-3cm | 0.6155 | 0.0108 |  | 0.2715 | 0.0123 |  | 0.3245 | 0.0003 |  |
| 3-4cm | 0.2886 | 0.0027 |  | 0.3837 | 0.0000 |  | 0.0106 | 0.0006 |  |
| 4-5cm | 0.0734 | 0.0555 |  | 0.5340 | 0.0023 |  | 0.1196 | 0.0579 |  |
| Other Genera | Pockmark | 0-1cm | 0.803 | 0.031 |  | 0.371 | 0.091 |  | 0.666 | 0.009 |  |
| 1-2cm | 0.869 | 0.162 |  | 0.024 |  | 0.191 | 0.298 | 0.011 |  |
| 2-3cm | 0.250 | 0.003 |  | 0.253 | 0.000 |  | 0.562 | 0.001 |  |
| 3-4cm | 0.970 | 0.002 |  | 0.308 | 0.001 |  | 0.611 | 0.001 |  |
| 4-5cm | 0.033 |  | 0.000 | 0.005 |  | 0.000 | 0.417 | 0.011 |  |
| Reference | 0-1cm | 0.409 | 0.011 |  | 0.124 | 0.000 |  | 0.349 | 0.544 |  |
| 1-2cm | 0.351 | 0.000 |  | 0.119 | 0.000 |  | 0.345 | 0.000 |  |
| 2-3cm | 0.549 | 0.000 |  | 0.186 | 0.000 |  | 0.261 | 0.000 |  |
| 3-4cm | 0.457 | 0.000 |  | 0.048 |  |  | 0.929 | 0.000 |  |
| 4-5cm | 0.630 | 0.000 |  | 0.273 | 0.000 |  | 0.276 | 0.000 |  |
| Abyssal | 0-1cm | 0.810 | 0.000 |  | 0.714 | 0.000 |  | 0.330 | 0.021 |  |
| 1-2cm | 0.938 | 0.000 |  | 0.163 | 0.000 |  | 0.406 | 0.000 |  |
| 2-3cm | 0.145 | 0.000 |  | 0.049 |  | 0.000 | 0.002 |  | 0.000 |
| 3-4cm | 0.347 | 0.000 |  | 0.055 | 0.000 |  | 0.853 | 0.000 |  |
| 4-5cm | 0.998 | 0.000 |  | 0.253 | 0.557 |  | 0.229 | 0.000 |  |

Table 19: Description of null models applied in the calculation of standard effect size (ses) of Phylogenetic Diversity (ses.PD), unweighted Mean Pairwise Distance (ses.MPD) and unweighted Mean Nearest Taxon Distance (ses.MNTD) for Nematoda, Genus-assigned, Unassigned, *Desmoscolex*, *Acantholaimus*, and *Halalaimus* ASVs Abyssal, Pockmark and Reference areas. Source: R Package “picante” vignette.

|  |  |
| --- | --- |
| Null Model | Randomization |
| taxa.labels | Shuffle distance matrix labels (across all taxa included in distance matrix) |
| richness | Randomize community data matrix abundances within samples (maintains sample species richness) |
| frequency | Randomize community data matrix abundances within species (maintains species occurrence frequency) |
| sample.pool | Randomize community data matrix by drawing species from pool of species occurringin at least one community (sample pool) with equal probability |
| phylogeny.pool | Randomize community data matrix by drawing species from pool of species occurringin the distance matrix (phylogeny pool) with equal probability |
| independentswap | Randomize community data matrix with the independent swap algorithm (Gotelli, 2000)maintaining species occurrence frequency and sample species richness |
| trialswap | Randomize community data matrix with the trial-swap algorithm (Miklós and Podani, 2004) maintaining species occurrence frequency and sample species richness |

**Resources**

Bioinformatics

<https://docs.google.com/document/d/1u63B_CG6IK26GtulgaNHgTE784dzMkWOc85FtE9uaYA/edit?usp=sharing>

DADA2 output

<https://docs.google.com/spreadsheets/d/1o6_xzSMTpxf1QVVj1gue0vMz8gFoWr3YAdwILaBKP5g/edit?usp=sharing>

Table 20: Patterns and processes of phylogenetic community structure and co-occurrence patterns.

|  |  |
| --- | --- |
| **Pattern** | **Process** |
| Phylogenetic clustering | Habitat filtering conserved traits, competitive exclusion conserved/convergent traits |
| Phylogenetic randomness | Competitive exclusion, neutral species interactions, phylogenetically random niches, weak/balanced environmental filtering/density-dependent processes |
| Phylogenetic overdispersion | Competitive exclusion conserved traits, habitat filtering convergent traits |
| Co-occurrence aggregation | Mutualism, commensalism, affinity for overlapping habitats, sympatric speciation |
| Co-occurrence randomness | Neutral species interactions |
| Co-occurrence segregation | Competitive exclusion, non-overlapping habitats, allopatric speciation |
| Phylogenetic successional patterns | Pioneer stage: random assemblages > Intermediate stage: overdispersion > Late stage: randomness |

References

Gotelli, N. J. (2000). Null model analysis of species co-occurrence patterns. *Ecology* 81, 2606–2621.

Miklós, I., and Podani, J. (2004). Randomization of presence-absence matrices: Comments and new algorithms. *Ecology* 85, 86–92. doi:10.1890/03-0101.