Table S1. Samples sequences of *dmdA* gene and environment factors information.

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sample | Depth | OTU | Ace | Chao | Coverage | Shannon | Simpson | PO4 (mg/L) | SiO4 (mg/L) | NO3 (mg/L) | Temperature (°C) | Salinity | *Chl* a (mg/L) |
| S1-25 | 25 | 45 | 47 | 46 | 0.999 | 2.41 | 0.196 | 0.106 | 1.607 | 4.250 | 21.517 | 34.454 | 0.608 |
| S2-0 | 0 | 30 | 31 | 30 | 0.999 | 2.08 | 0.189 | 0.064 | 0.083 | 1.560 | 30.352 | 34.477 | 0.130 |
| S2-25 | 25 | 35 | 35 | 35 | 0.999 | 0.90 | 0.702 | 0.516 | 0.146 | 3.956 | 27.944 | 34.460 | 0.231 |
| S3-0 | 0 | 28 | 32 | 31 | 0.999 | 1.41 | 0.374 | 0.222 | 0.057 | 1.084 | 30.518 | 34.539 | 0.052 |
| S4-25 | 25 | 49 | 51 | 55 | 0.999 | 2.73 | 0.101 | 0.061 | 0.012 | 1.011 | 29.017 | 34.620 | 0.492 |
| S4-50 | 50 | 44 | 45 | 45 | 0.999 | 3.07 | 0.059 | 0.128 | 0.040 | 2.989 | 27.513 | 34.621 | 0.272 |
| S4-100 | 100 | 12 | 16 | 13 | 0.999 | 1.59 | 0.237 | 0.219 | 0.006 | 8.282 | 22.763 | 34.621 | 0.082 |
| S5-0 | 0 | 50 | 52 | 53 | 0.999 | 2.25 | 0.223 | 0.037 | 0.036 | 1.322 | 29.690 | 34.489 | 0.078 |
| S6-0 | 0 | 40 | 42 | 43 | 0.999 | 2.15 | 0.165 | 0.047 | 0.010 | 0.882 | 29.261 | 34.433 | 0.076 |
| S6-25 | 25 | 38 | 40 | 39 | 0.999 | 1.75 | 0.359 | 0.075 | 0.006 | 2.128 | 28.586 | 34.431 | 0.095 |
| S6-50 | 50 | 41 | 41 | 41 | 0.999 | 2.00 | 0.248 | 0.061 | 0.010 | 6.212 | 27.217 | 34.433 | 0.347 |
| S8-0 | 0 | 31 | 40 | 36 | 0.999 | 1.28 | 0.466 | 0.075 | 0.012 | 3.648 | 30.188 | 33.670 | 0.057 |
| S8-100 | 100 | 12 | 12 | 12 | 0.999 | 1.40 | 0.330 | 0.142 | 0.025 | 1.982 | 23.966 | 34.560 | 0.179 |
| S9-0 | 0 | 49 | 51 | 50 | 0.999 | 2.04 | 0.258 | 0.114 | 0.018 | 1.212 | 30.237 | 33.470 | 0.052 |
| S9-25 | 25 | 46 | 50 | 50 | 0.999 | 2.01 | 0.218 | 0.075 | 0.007 | 1.139 | 30.247 | 33.511 | 0.095 |
| S9-50 | 50 | 50 | 52 | 52 | 0.999 | 2.33 | 0.169 | 0.096 | 0.061 | 0.022 | 26.958 | 33.791 | 0.190 |
| S9-100 | 100 | 15 | 0 | 43 | 0.999 | 0.65 | 0.705 | 0.065 | 0.016 | 0.754 | 21.855 | 34.519 | 0.307 |
| S9-200 | 200 | 18 | 19 | 18 | 0.999 | 1.58 | 0.296 | 0.163 | 0.093 | 1.707 | 15.685 | 34.551 | 0.177 |