Supplementary Material



Supplementary Figure 1. Bray–Curtis similarity estimated by hierarchical cluster analysis with regard to zooplankton abundance (A) and the relative contribution (B) of each sampling station.

Supplementary Table 1. Total abundance, biomass, and ecological parameters for zooplankton collected in Oct 2017 and Apr 2018.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Oct 2017 |  |  |  |  |  |  |  |  |
|  | St.01 | St.02 | St.04 | St.05 | St.07 | St.08 | St.09 | St.10 |
| Number of taxon | 8 | 7 | 7 | 9 | 9 | 8 | 8 | 9 |
| Total abundance (ind/m3) | 2249.82 | 3591.21 | 2859.64 | 1875.54 | 593.45 | 1486.29 | 450.49 | 503.63 |
| Total biomass (wet mg/m3) | 78.17 | 79.46 | 39.98 | 84.25 | 33.17 | 36.15 | 23.69 | 21.94 |
| Dominance | 0.72 | 0.78 | 0.86 | 0.83 | 0.66 | 0.84 | 0.66 | 0.57 |
| Diversity | 0.62 | 0.52 | 0.35 | 0.42 | 0.75 | 0.39 | 0.73 | 0.88 |
| Evenness | 0.23 | 0.24 | 0.20 | 0.17 | 0.24 | 0.18 | 0.26 | 0.27 |
| Richness | 0.91 | 0.73 | 0.75 | 1.06 | 1.26 | 0.96 | 1.15 | 1.29 |
|  |  |  |  |  |  |  |  |  |
| Apr 2018 |  |  |  |  |  |  |  |  |
|  | St.01 | St.02 | St.04 | St.05 | St.07 | St.08 | St.09 | St.10 |
| Number of taxon | 11 | 8 | 7 | 9 | 10 | 8 | 9 | 8 |
| Total abundance (ind/m3) | 250.55 | 168.17 | 140.38 | 176.99 | 64.48 | 52.07 | 37.73 | 87.37 |
| Total biomass (wet mg/m3) | 71.81 | 42.28 | 43.87 | 18.93 | 19.08 | 55.24 | 30.07 | 51.35 |
| Dominance | 0.30 | 0.31 | 0.32 | 0.28 | 0.25 | 0.19 | 0.30 | 0.29 |
| Diversity | 1.48 | 1.40 | 1.43 | 1.53 | 1.67 | 1.78 | 1.60 | 1.54 |
| Evenness | 0.40 | 0.51 | 0.59 | 0.52 | 0.53 | 0.74 | 0.55 | 0.58 |
| Richness | 1.82 | 1.38 | 1.22 | 1.55 | 2.21 | 1.81 | 2.25 | 1.58 |

Supplementary Table 2. Results of permutation test (*p* value) regarding with the zooplankton diversity among sampling stations. Significant difference between stations (*p*<0.05) was expressed as bold letter.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Oct 2017 |  |  |  |  |  |  |  |  |
|  | St.01 | St.02 | St.04 | St.05 | St.07 | St.08 | St.09 | St.10 |
| St.01 |  | **0.0014** | **0.0001** | **0.0001** | **0.0077** | **0.0001** | 0.0593 | **0.0001** |
| St.02 |  |  | **0.0001** | **0.0002** | **0.0001** | **0.0001** | **0.0004** | **0.0001** |
| St.04 |  |  |  | **0.0273** | **0.0001** | 0.2510 | **0.0001** | **0.0001** |
| St.05 |  |  |  |  | **0.0001** | 0.4478 | **0.0001** | **0.0001** |
| St.07 |  |  |  |  |  | **0.0001** | 0.6953 | 0.0515 |
| St.08 |  |  |  |  |  |  | **0.0001** | **0.0001** |
| St.09 |  |  |  |  |  |  |  | **0.0246** |
| St.10 |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| Apr 2018 |  |  |  |  |  |  |  |  |
|  | St.01 | St.02 | St.04 | St.05 | St.07 | St.08 | St.09 | St.10 |
| St.01 |  | 0.4190 | 0.5739 | 0.5776 | 0.1007 | **0.0306** | 0.4476 | 0.5380 |
| St.02 |  |  | 0.8625 | 0.1917 | **0.0338** | **0.0056** | 0.2492 | 0.2247 |
| St.04 |  |  |  | 0.3045 | 0.0558 | **0.0152** | 0.3184 | 0.3325 |
| St.05 |  |  |  |  | 0.1941 | 0.0572 | 0.6165 | 0.8384 |
| St.07 |  |  |  |  |  | 0.5252 | 0.7054 | 0.3387 |
| St.08 |  |  |  |  |  |  | 0.2933 | 0.0642 |
| St.09 |  |  |  |  |  |  |  | 0.7201 |
| St.10 |  |  |  |  |  |  |  |  |

Supplementary Table 3. The δ15N of amino acids in frozen and preserved samples (*Paratya* spp.). We tested 10% formalin, 70% ethanol, and DESS-martin solution for preserved samples. DESS-martin fixed samples were purified by cation-exchange chromatography before derivatization. Formalin (r2=0.989), ethanol (r2=0.995), and DESS-martin (purified, r2=0.992) fixed samples showed good regression between frozen sample (control).

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Ala | Gly | Val | Pro | Ser | Glu | Phe |
| Frozen | Control | 17.1 | 4.3 | 15.7 | 14.5 | 3.8 | 17.9 | 4.9 |
| Preserved for a week | Formalin | 17.9 | 4.4 | 16.6 | 14.8 | 3.0 | 17.0 | 5.1 |
|  | Ethanol | 17.8 | 5.2 | 16.3 | 15.0 | 4.4 | 18.4 | 5.6 |
|  | DESS-martin | 17.1 | 4.7 | 15.8 | 15.2 | 3.5 | 18.1 | 4.9 |
| Preserved for two months | Formalin | 16.7 | 3.9 | 15.1 | 14.4 | 3.2 | 17.2 | 5.4 |
|  | Ethanol | 16.5 | 4.7 | 16.2 | 14.4 | 3.6 | 17.5 | 5.1 |
|  | DESS-martin | 17.1 | 5.2 | 15.5 | 14.5 | 3.7 | 18.5 | 4.3 |

Supplementary Table 4. The offset of δ15NAAs values between frozen and preserved samples (*Paratya* spp.).

|  |  |  |
| --- | --- | --- |
|  |  | δ15NAAs\_Preserved- δ15NAAs\_control |
|  |  | Ala | Gly | Val | Pro | Ser | Glu | Phe |
| Preserved for a week | Formalin | 0.8 | 0.2 | 0.9 | 0.3 | -0.8 | -0.9 | 0.2 |
|  | Ethanol | 0.7 | 0.9 | 0.6 | 0.5 | 0.6 | 0.4 | 0.6 |
|  | DESS-martin | 0.0 | 0.5 | 0.1 | 0.7 | -0.3 | 0.2 | 0.0 |
| Preserved for two months | Formalin | -0.4 | -0.3 | -0.5 | -0.1 | -0.6 | -0.8 | 0.5 |
|  | Ethanol | -0.6 | 0.5 | 0.5 | -0.1 | -0.2 | -0.4 | 0.2 |
|  | DESS-martin | 0.0 | 0.9 | -0.2 | 0.0 | -0.1 | 0.6 | -0.6 |