Table 1 Basic information of the artificial ecological islands

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Island | H | A, B, F | D, E, K | I, J |
| Constructed year | 2011 | 2013 | 2011 | 2013 | |
| Substrate | Pebble | Pebble | Soil | Soil | |

Table 2 Two-way crossed ANOSIM for testing the site and year on the macrobenthos communities in the park and the differences between two sites and two years（Shallow and deep: Two water levels of island）

|  |  |  |  |
| --- | --- | --- | --- |
|  | Global R | Pairwise test R | P value |
| Year | 0.135 |  | 0.001 |
| 2015 and 2016 |  | 0.086 | 0.001 |
| 2015 and 2017 |  | 0.195 | 0.001 |
| 2016 and 2016 |  | 0.15 | 0.001 |
| Site | 0.036 |  | 0.002 |
| Island and water |  | 0.136 | 0.001 |
| Water and shallow |  | 0.18 | 0.001 |
| Water and deep |  | 0.159 | 0.001 |
| Two water levels of island |  | 0.022 | 0.001 |
| Island and shollow |  | 0.008 | 0.274 |
| Island and deep |  | -0.016 | 0.873 |

Table 3 List of taxa identified in the respective ecological groups in the park.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 3 years | W | I | W&I | D | S | D&S | Ⅰ | Ⅱ | Ⅰ&Ⅱ | P | S | P&S |
| Eulamellibranchia | \* |  | + | \* | + |  |  |  | + | \* |  | + |  |
| Basommatophora | \* |  | + | \* |  | + |  | + |  |  | + |  | \* |
| Mesogastropoda |  | + |  | \* | + |  | \* |  | + | \* | + |  | \* |
| Tubificida | \* |  | + | \* | + |  |  | + |  |  | + |  |  |
| Decapoda |  |  | + |  |  | + | \* | + |  |  | + |  | \* |
| Hemiptera | \* |  | + | \* |  | + | \* |  | + |  | + |  |  |
| Ephemerptera | \* |  | + |  | + |  |  |  | + |  | + |  | \* |
| Trichoptera | \* |  | + |  | + |  |  | + |  |  | + |  |  |
| Coleoptera | \* |  | + | \* |  | + |  |  | + |  | + |  | \* |
| Odonata | \* |  | + | \* |  | + |  |  | + |  | + |  |  |
| Diptera | \* | + |  |  | + |  |  |  |  | \* | + |  | \* |
| Rhynchobdellida Blanchard | \* |  | + | \* | + |  |  |  | + |  | + |  | \* |

Results of pairwise one-way ANOVA for the different site types in the park (for all taxa with significant compositional differences, \*: [significant](javascript:;) [difference](javascript:;) (P<0.05), 1) and the abundance comparison to the dissimilarity between groups for each taxa (+). (W: open water; I: islands; D: deep level of island; SH: shallow level of island; Ⅰ: built in 2011; Ⅱ: built in 2013; P: pebble island; and S: soil island). The variable of three years is "time". Two islands built at different times (2011 and 2013) also demonstrated significant changes in the benthic animal diversity of the islands built two years earlier under the same conditions (weather, water environment).

Table 4 Two-way crossed ANOSIM for testing the islands’ substrate and construction time with year on the macrobenthos communities in the park, and the differences in macrobenthos communities between substrate and construction time.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Build time | Global R | Pairwise test R | P value | Substrate | Global R | Pairwise test R | P value |
| Year | 0.148 |  | 0.001 | Year | 0.154 |  | 0.001 |
| 2015 and 2016 |  | 0.111 | 0.001 | 2015 and 2016 |  | 0.103 | 0.001 |
| 2015 and 2017 |  | 0.291 | 0.001 | 2015 and 2017 |  | 0.197 | 0.001 |
| 2016 and 2016 |  | 0.138 | 0.001 | 2016 and 2016 |  | 0.174 | 0.001 |
| Two build times | 0.062 |  | 0.001 | Two substrates | 0.042 |  | 0.02 |