**Supplementary materials (Fig. S1-2; Table S1-2):**

**Fig. S1** Comparison of the community richness of iron-reducing bacteria at each site. The value is expressed as the average number of samples from the triplicate plots of each site.

**Fig. S2** Venn charts showing the total number of OTUs of iron-reducing bacteria detected from the 2 ecosystems. (YR: Yellow River, BH: Bohai Sea.)

**Table S1** Summary of reads and number of OTUs of iron-reducing bacteria under 4999 randomly selected sequences per sample.

**Table S2** Physicochemical gradients at YR1, YR2, YR3, BHB02, P1, and P2 in the coastal zone of the Yellow River estuary and adjacent Bohai Sea.



**Fig. S1** Comparison of the community richness of iron-reducing bacteria at each site. The value is expressed as the average number of samples from the triplicate plots of each site.



**Fig. S2** Venn charts showing the total numbers of OTUs of iron-reducing bacteria detected from the two ecosystems. (YR: Yellow River, BH: Bohai Sea.)

**Table S1** Summary of reads and number of OTUs of iron-reducing bacteria (IRB) under 4999 randomly selected sequences per sample.

|  |  |  |  |
| --- | --- | --- | --- |
| Site | Sample | Number of reads | Number of OTUs |
|  | Y27 | 207  146  243  4  5  6  8  7  4  111  117  123  109  110  112  237  236  278 | 26  29  31  4  6  7  8  8  5  27  32  25  22  27  29  30  23  34 |
| BHB02 | Y82 |
|  | Y155 |
|  | Y28 |
| P1 | Y101 |
|  | Y156 |
|  | Y29 |
| P2 | Y102 |
|  | Y157 |
|  | Y30 |
| YR1 | Y103 |
|  | Y158 |
|  | Y21 |
| YR2 | Y76 |
|  | Y149 |
|  | Y31 |
| YR3 | Y104 |
|  | Y159 |

**Table S2** Physicochemical gradients at YR1, YR2, YR3, BHB02, P1, and P2 in the coastal zone of the Yellow River estuary and adjacent Bohai Sea.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | YR1 | YR2 | YR3 | BHB02 | P1 | P2 |
| pH | 8.02 | 7.82 | 7.9 | 7.99 | 7.98 | 7.95 |
| Salinity (PSU) | 0.5 | 0.5 | 1.5 | 28.75 | 30.05 | 29.52 |
| TOC (g•Kg-1) | 6.214±0.31 | 6.036±0.3 | 3.204±0.16 | 6.345±0.32 | 6.717±0.34 | 4.837±0.25 |
| TN (g•Kg-1) | 0.089±0.004 | 0.092±0.004 | 0.104±0.005 | 0.825±0.04 | 0.261±0.01 | 0.613±0.03 |
| NH4-N (mg•Kg-1) | 6.13±0.31 | 5.77±0.29 | 7.23±0.36 | 31.96±0.6 | 20.40±0.51 | 24.09±0.62 |
| NO3-N (mg•Kg-1) | 2.72±0.14 | 0.59±0.03 | 8.07±0.4 | 0.07±0.004 | 0.10±0.005 | 0.10±0.005 |
| Sulfate (g•L-1) | 0.07±0.004 | 0.11±0.005 | 0.13±0.006 | 2.13±0.11 | 1.29±0.06 | 2.91±0.15 |
| Fe (II) (g•Kg-1) | 1.05±0.018 | 1.19±0.005 | 0.86±0.006 | 3.21±0.017 | 2.06±0.023 | 4.41±0.051 |
| Fe(III) (g•Kg-1) | 3.14±0.055 | 2.86±0.029 | 2.57±0.018 | 9.64±0.051 | 6.17±0.069 | 13.22±0.152 |
| Total Fe (g•Kg-1) | 18.96±0.52 | 21.32±0.53 | 24.04±0.6 | 35.30±0.76 | 27.19±0.34 | 29.98±0.5 |
| χLF | 36.3 | 37.7 | 49.9 | 63.05 | 46.13 | 52.15 |