**Table 1.** Bacteria Beta diversity Bray-Curtis. The table below summarizes the result of pairwise PERMANOVA analysis. The multi-testing adjustment is based on Benjamini-Hochberg procedure procedure (FDR).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Pair** | **F-value** | **R-squared** | **P-value** | **FDR** |
| CTR vs NPK | 2.5627 | 0.26799 | 0.037 | 0.23 |
| OP vs NPK | 2.5105 | 0.26398 | 0.046 | 0.23 |
| SB vs OP | 1.9005 | 0.24055 | 0.079 | 0.2375 |
| SBOP vs NPK | 1.8262 | 0.2069 | 0.095 | 0.2375 |
| SB vs SBOP | 1.5699 | 0.20739 | 0.158 | 0.316 |
| SB vs CTR | 1.6253 | 0.21314 | 0.201 | 0.335 |
| SB vs NPK | 0.94462 | 0.1189 | 0.497 | 0.625 |
| SBOP vs CTR | 0.8891 | 0.12906 | 0.5 | 0.625 |
| OP vs CTR | 0.84228 | 0.1231 | 0.625 | 0.69444 |
| OP vs SBOP | 0.67989 | 0.10178 | 0.775 | 0.775 |

**Table 2.** Fungi Beta diversity Bray-Curtis. The table below summarizes the result of pairwise PERMANOVA analysis. The multi-testing adjustment is based on Benjamini-Hochberg procedure procedure (FDR).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Pair** | **F-value** | **R-squared** | **P-value** | **FDR** |
| OP vs NPK | 1.5973 | 0.18579 | 0.032 | 0.19667 |
| OP vs CTR | 2.3094 | 0.27793 | 0.047 | 0.19667 |
| SBOP vs CTR | 2.4954 | 0.29374 | 0.059 | 0.19667 |
| SBOP vs NPK | 1.5329 | 0.17964 | 0.08 | 0.2 |
| SB vs CTR | 1.2429 | 0.1716 | 0.329 | 0.56286 |
| SB vs SBOP | 1.1473 | 0.16053 | 0.356 | 0.56286 |
| CTR vs NPK | 1.0715 | 0.13275 | 0.394 | 0.56286 |
| SB vs NPK | 0.99898 | 0.12489 | 0.538 | 0.6725 |
| SBOP vs OP | 0.61709 | 0.093257 | 0.787 | 0.87444 |
| SB vs OP | 0.55653 | 0.084882 | 0.94 | 0.94 |

**Table. 3** Bacteria LEfSe results with P value cut of 0.05 and Log LDA score 2.0. The table below shows the most 44 features ranked by their p values that are statistically significant.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Pvalues** | **FDR** | **CTR** | **NPK** | **OP** | **SB** | **SBOP** | **LDAscore** |
| **p\_\_Candidatus\_Rokubacteria** | 0.0079255 | 0.39859 | 47363 | 93573 | 36597 | 94259 | 66045 | 4.46 |
| **o\_\_Oceanospirillales** | 0.0085641 | 0.39859 | 167.08 | 237.66 | 914.45 | 319.95 | 788.61 | 2.57 |
| **g\_\_Pseudonocardia** | 0.011346 | 0.39859 | 53544 | 40963 | 68022 | 38007 | 58464 | 4.18 |
| **p\_\_Armatimonadetes** | 0.011604 | 0.39859 | 78267 | 160810 | 87023 | 146980 | 104390 | 4.62 |
| **f\_\_Bryobacteraceae** | 0.011712 | 0.39859 | 251.4 | 315.12 | 1176.3 | 43.415 | 1180 | 2.76 |
| **f\_\_Micromonosporaceae** | 0.014241 | 0.39859 | 103270 | 74351 | 138160 | 69523 | 147850 | 4.59 |
| **f\_\_Steroidobacteraceae** | 0.014522 | 0.39859 | 12551 | 14513 | 19760 | 11867 | 25954 | 3.85 |
| **o\_\_Sphingomonadales** | 0.017217 | 0.39859 | 5047.6 | 9244.3 | 9960.7 | 4163 | 9617 | 3.46 |
| **f\_\_Rhodobacteraceae** | 0.018303 | 0.39859 | 4329.2 | 2934.7 | 11488 | 3183.3 | 16851 | 3.84 |
| **f\_\_Hyphomonadaceae** | 0.020315 | 0.39859 | 1699.6 | 2001.3 | 4988 | 1438.7 | 4690.4 | 3.25 |
| **o\_\_Rhizobiales** | 0.020656 | 0.39859 | 281270 | 251420 | 341210 | 197400 | 318470 | 4.86 |
| **g\_\_Phaselicystis** | 0.020886 | 0.39859 | 3608.9 | 2186.8 | 4187.6 | 3069 | 5281 | 3.19 |
| **g\_\_Thiobacillus\*** | 0.021653 | 0.39859 | 0 | 0 | 132.31 | 980.01 | 2639.8 | 3.12 |
| **f\_\_Nitrososphaeraceae** | 0.022037 | 0.39859 | 365770 | 136510 | 195610 | 412810 | 219290 | 5.14 |
| **g\_\_Hirschia** | 0.022629 | 0.39859 | 1824.4 | 1832.7 | 3201.9 | 655.7 | 4738.3 | 3.31 |
| **f\_\_Iamiaceae** | 0.023782 | 0.39859 | 1142.5 | 1663.3 | 3328.4 | 820.35 | 2807.1 | 3.1 |
| **g\_\_Pseudoxanthomonas** | 0.024931 | 0.39859 | 86.696 | 0 | 1772.3 | 0 | 2182.3 | 3.04 |
| **f\_\_Geminicoccaceae** | 0.026433 | 0.39859 | 30525 | 23287 | 40540 | 21616 | 35829 | 3.98 |
| **c\_\_Nitrospira** | 0.028002 | 0.39859 | 61392 | 112270 | 46550 | 73893 | 62666 | 4.52 |
| **o\_\_Xanthomonadales** | 0.028063 | 0.39859 | 2111.8 | 4958.5 | 3442.9 | 1607.7 | 2903.8 | 3.22 |
| **f\_\_Sandaracinaceae** | 0.028685 | 0.39859 | 12045 | 5757 | 8704.8 | 4296.4 | 17704 | 3.83 |
| **f\_\_Burkholderiaceae** | 0.029953 | 0.39859 | 14717 | 24321 | 10934 | 21679 | 14969 | 3.83 |
| **g\_\_Paludibaculum** | 0.032001 | 0.39859 | 297.41 | 768.17 | 2496 | 815.61 | 2486.5 | 3.04 |
| **c\_\_Thermoplasmata** | 0.032353 | 0.39859 | 7879 | 4832 | 2444 | 16925 | 6296.4 | 3.86 |
| **f\_\_Gemmatimonadaceae** | 0.038068 | 0.39859 | 366070 | 661960 | 449430 | 572720 | 480250 | 5.17 |
| **o\_\_Bryobacterales** | 0.038525 | 0.39859 | 809.31 | 1822.4 | 1963 | 955.91 | 2069.5 | 2.8 |
| **f\_\_Thermoanaerobaculaceae** | 0.040188 | 0.39859 | 3607 | 4833.9 | 7158.7 | 3349.2 | 5768.9 | 3.28 |
| **f\_\_Hyphomicrobiaceae** | 0.04337 | 0.39859 | 26456 | 23622 | 33992 | 17141 | 37036 | 4 |
| **f\_\_Methylophilaceae** | 0.043923 | 0.39859 | 172.63 | 1387.2 | 409.45 | 294.5 | 673.63 | 2.78 |
| **c\_\_Deltaproteobacteria** | 0.04482 | 0.39859 | 34735 | 63729 | 39249 | 48048 | 48905 | 4.16 |
| **f\_\_Rhodospirillaceae** | 0.045501 | 0.39859 | 19937 | 16884 | 25395 | 13608 | 22938 | 3.77 |
| **g\_\_Nitrosospira** | 0.045857 | 0.39859 | 84.064 | 1536.7 | 207.67 | 246.87 | 301.51 | 2.86 |
| **f\_\_Xanthobacteraceae** | 0.046043 | 0.39859 | 118000 | 92957 | 122970 | 84835 | 121650 | 4.28 |
| **o\_\_Micrococcales** | 0.046043 | 0.39859 | 21871 | 17483 | 20204 | 7061.7 | 27174 | 4 |
| **g\_\_Anaeromyxobacter** | 0.046292 | 0.39859 | 22736 | 27057 | 11164 | 23241 | 20608 | 3.9 |
| **g\_\_Adhaeribacter** | 0.047013 | 0.39859 | 1527.3 | 366.16 | 1566.5 | 162.49 | 1353 | 2.85 |
| **f\_\_Cellulomonadaceae** | 0.047757 | 0.39859 | 930.45 | 355.28 | 1460.3 | 344.32 | 1853.4 | 2.88 |
| **o\_\_Cytophagales** | 0.049375 | 0.39859 | 1950.3 | 2206.4 | 3219.1 | 767.97 | 3934.9 | 3.2 |
| **f\_\_Ruminococcaceae** | 0.049452 | 0.39859 | 506.23 | 33.101 | 292.27 | 344.03 | 849.23 | 2.61 |
| **c\_\_Nitrososphaeria** | 0.049727 | 0.39859 | 2085.1 | 1252.2 | 170.03 | 4820.5 | 2492.4 | 3.37 |
| **o\_\_Gemmatimonadales** | 0.049774 | 0.39859 | 26693 | 60167 | 37011 | 38090 | 34892 | 4.22 |

**Table 4.** Fungi LEfSe results with P value cut of 0.05 and Log LDA score 2.0. The table below shows the most 28 features ranked by their p values that are statistically significant.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Pvalues** | **FDR** | **CTR** | **NPK** | **OP** | **SB** | **SBOP** | **LDAscore** |
| **s\_\_Tritirachium\_oryzae** | 0.00058283 | 0.062815 | 0 | 0 | 1175.1 | 0 | 3049.5 | 3.18 |
| **s\_\_Zoopagales\_sp** | 0.00058283 | 0.062815 | 0 | 0 | 932.99 | 0 | 8488.6 | 3.63 |
| **o\_\_Zoopagales** | 0.00065432 | 0.062815 | 0 | 0 | 529.14 | 0 | 1401.6 | 2.85 |
| **s\_\_Podospora\_pyriformis** | 0.0014181 | 0.07733 | 78.761 | 395.95 | 32137 | 0 | 178890 | 4.95 |
| **s\_\_Pleurotheciella\_sp** | 0.0015757 | 0.07733 | 0 | 98.987 | 1897.6 | 0 | 14383 | 3.86 |
| **s\_\_Monascus\_pallens** | 0.001611 | 0.07733 | 0 | 230.97 | 1784.6 | 0 | 5397.2 | 3.43 |
| **s\_\_Zopfiella\_sp** | 0.0019677 | 0.07758 | 0 | 68.043 | 1135.5 | 0 | 2478.7 | 3.09 |
| **g\_\_Thermomyces** | 0.002155 | 0.07758 | 0 | 958.93 | 37246 | 35.385 | 105080 | 4.72 |
| **s\_\_Dactylella\_cylindrospora** | 0.0028479 | 0.084881 | 0 | 0 | 2097.7 | 0 | 3055.2 | 3.18 |
| **s\_\_Ophiostomatales\_sp** | 0.0029473 | 0.084881 | 0 | 131.98 | 526.09 | 0 | 2847.3 | 3.15 |
| **f\_\_Ophiocordycipitaceae** | 0.0047992 | 0.12255 | 2687.7 | 6387.9 | 28270 | 3672.5 | 10734 | 4.11 |
| **g\_\_Pseudallescheria** | 0.0051061 | 0.12255 | 0 | 32.996 | 1445 | 38.286 | 4732 | 3.37 |
| **o\_\_Tubeufiales** | 0.0055394 | 0.12272 | 0 | 230.97 | 16084 | 0 | 12939 | 3.91 |
| **c\_\_Agaricomycetes** | 0.0060289 | 0.12402 | 435.66 | 318.87 | 5502.4 | 332.97 | 20390 | 4 |
| **p\_\_Rozellomycota** | 0.0070998 | 0.1338 | 398.99 | 55.16 | 1429 | 79.215 | 2547.9 | 3.1 |
| **f\_\_Microascaceae** | 0.0074335 | 0.1338 | 160.5 | 1001.6 | 4303.2 | 645.4 | 9720.8 | 3.68 |
| **g\_\_Chaetomium** | 0.013263 | 0.21488 | 91224 | 73520 | 27767 | 47879 | 47176 | 4.5 |
| **s\_\_Veronaea\_botryosa** | 0.01343 | 0.21488 | 236.28 | 32.996 | 441.78 | 0 | 1109 | 2.74 |
| **p\_\_Ascomycota** | 0.015144 | 0.22955 | 73965 | 80363 | 307470 | 60175 | 571300 | 5.41 |
| **s\_\_Zopfiella\_attenuata** | 0.018293 | 0.26293 | 28645 | 12007 | 450.71 | 9003.1 | 6358.7 | 4.15 |
| **s\_\_Tremellomycetes\_sp** | 0.019172 | 0.26293 | 159.95 | 164.98 | 10412 | 368.68 | 8447.8 | 3.71 |
| **g\_\_Podospora** | 0.023847 | 0.3116 | 587.38 | 697.56 | 2376.4 | 989.77 | 16109 | 3.89 |
| **g\_\_Peziza** | 0.024885 | 0.3116 | 0 | 230.44 | 4761.3 | 176520 | 1322 | 4.95 |
| **g\_\_Malbranchea** | 0.027499 | 0.32227 | 553.65 | 0 | 945.45 | 2271.4 | 493.76 | 3.06 |
| **f\_\_Pezizaceae** | 0.027975 | 0.32227 | 1950.1 | 1248.1 | 8839.5 | 16211 | 16582 | 3.88 |
| **s\_\_Spizellomycetales\_sp** | 0.043144 | 0.4779 | 117.31 | 680.73 | 565.7 | 181.9 | 650.51 | 2.45 |
| **s\_\_Ciliophora\_sp\_1** | 0.048326 | 0.50216 | 27040 | 16503 | 6251.1 | 6164.2 | 20437 | 4.02 |