**Supplementary Table 1.** Nucleotide sequences of primers used for gene expression analysis by qPCR.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Gene** | **Acc. N.** | **Primer** | **Nucleotide sequence (5’- 3’)** | **Efficiency (%)** |  |
| *il-1β* | AJ269472 | Forward | TTGTGTTTGAGCGCGGAACA | 99.0 |  |
|  |  | Reverse | TGTCGGTCACGCTGCATTG |  |
| *tnf-α* | DQ070246 | Forward | AAACCGGCCTCTACTTCGTCTA | 92.1 |  |
|  |  | Reverse | TCCCGCACTTTCCTCTTCAC |  |
| *il-10* | AM268529 | Forward | AGCGCTGCTAGACCAGACTGT | 99.6 |  |
|  |  | Reverse | CGGCAGAACCGTGCTTAGAT |  |
| *mhc-II* | AM113466 | Forward | GCTCAGAGACGGACAGGAAG | 94.4 |  |
|  |  | Reverse | CCAGGTGAGAGTGGATCTGG |  |
| *cox-2* | AJ630649 | Forward | AGCACTTCACCCACCAGTTC | 103.2 |  |
|  |  | Reverse | AAGCTTGCCATCCTTGAAGA |  |
| *cd-4* | AM849811 | Forward | TCACCCCACTCATCTCATCA | 102.8 |  |
|  |  | Reverse | TGATGAGATGAGTGGGGTGA |  |
| *β-actin* | AY148350 | Forward | TCTTCCAGCCTTCCTTCCT | 92.1 |  |
|  |  | Reverse | GATGTCAACGTCGCACTTCA |  |

**Supplementary Table 2.** Mean relative abundance (%) ± SD (n = 3) of the most prevalent phyla, orders, classes, families, and genera found in feed samples. Significant *p*-values are in bold (p<0.05).

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | **CTRL** | | | **ORG** | | | **PROB** | | | **PHYTO** | | | ***Sig.*** |
| **Phylum** | | |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Firmicutes | | | 23.99 | ± | 1.10 | 25.00 | ± | 1.01 | 35.83 | ± | 0.68 | 25.17 | ± | 1.72 | 0.065 |
| Proteobacteria | | | 74.86 | ± | 1.10 | 73.84 | ± | 0.92 | 63.32 | ± | 0.75 | 74.25 | ± | 1.77 | 0.082 |
| Class | | |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Bacilli | | | 23.07 | ± | 1.08b | 23.98 | ± | 0.86b | 35.19 | ± | 0.80a | 24.18 | ± | 1.55b | **0.003** |
| Alphaproteobacteria | | | 60.14 | ± | 0.87a | 64.78 | ± | 0.89a | 48.40 | ± | 2.76b | 66.87 | ± | 2.06a | **0.000** |
| Gammaproteobacteria | | | 14.72 | ± | 1.85a | 9.06 | ± | 1.42b | 14.92 | ± | 2.03a | 7.38 | ± | 0.34b | **0.000** |
| **Order** | | |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Flavobacteriales | | | 0.85 | ± | 0.19ab | 1.37 | ± | 0.41a | 0.45 | ± | 0.12bc | 0.40 | ± | 0.06c | **0.001** |
| Bacillales | | | 0.67 | ± | 0.17b | 0.68 | ± | 0.21b | 37.68 | ± | 3.39a | 1.38 | ± | 0.06b | **0.024** |
| Lactobacillales | | | 56.83 | ± | 3.40ab | 66.69 | ± | 3.25a | 30.40 | ± | 5.07b | 70.73 | ± | 0.45a | **0.018** |
| Peptostreptococcales-Tissierellales | | | 1.21 | ± | 0.08a | 1.51 | ± | 0.25a | 0.51 | ± | 0.17b | 1.36 | ± | 0.26a | **0.000** |
| Veillonellales-Selenomonadales | | | 0.92 | ± | 0.03ab | 1.17 | ± | 0.38a | 0.58 | ± | 0.05b | 1.37 | ± | 0.31a | **0.012** |
| Alteromonadales | | | 7.53 | ± | 1.72a | 5.28 | ± | 2.68ab | 1.95 | ± | 0.17bc | 1.15 | ± | 0.10c | **0.000** |
| Enterobacterales | | | 1.68 | ± | 0.09ab | 2.27 | ± | 0.92ab | 1.31 | ± | 0.28b | 2.70 | ± | 0.26a | **0.025** |
| Oceanospirillales | | | 9.28 | ± | 3.48a | 4.45 | ± | 0.74b | 1.17 | ± | 0.18c | 1.90 | ± | 0.19bc | **0.000** |
| Pseudomonadales | | | 7.76 | ± | 2.64b | 0.85 | ± | 0.14c | 18.64 | ± | 2.81a | 5.72 | ± | 1.34b | **0.000** |
| Vibrionales | | | 9.56 | ± | 1.37b | 12.13 | ± | 0.84a | 5.34 | ± | 0.52c | 10.23 | ± | 0.29ab | **0.000** |
| **Family** | | |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Microbacteriaceae | | | 0.74 | ± | 0.15 | 0.65 | ± | 0.15 | 0.45 | ± | 0.05 | 0.70 | ± | 0.21 | 0.144 |
| Flavobacteriaceae | | | 0.67 | ± | 0.09ab | 1.30 | ± | 0.47a | 0.42 | ± | 0.09bc | 0.21 | ± | 0.06c | **0.000** |
| Arcobacteraceae | | | 0.55 | ± | 0.26 | 0.59 | ± | 0.34 | 0.42 | ± | 0.05 | 0.00 | ± | 0.00 | 0.732 |
| Bacillaceae | | | 0.54 | ± | 0.20b | 0.56 | ± | 0.20b | 37.69 | ± | 3.42a | 1.26 | ± | 0.10b | **0.024** |
| Lactobacillaceae | | | 22.08 | ± | 1.45b | 27.75 | ± | 1.99ab | 11.08 | ± | 2.36c | 28.46 | ± | 2.09a | **0.000** |
| Leuconostocaceae | | | 33.07 | ± | 1.78ab | 36.81 | ± | 2.81a | 18.43 | ± | 2.36b | 40.52 | ± | 1.34a | **0.023** |
| Streptococcaceae | | | 0.64 | ± | 0.29 | 0.87 | ± | 0.27 | 0.38 | ± | 0.18 | 0.68 | ± | 0.30 | 0.230 |
| Peptostreptococcales-Tissierellales | | | 1.22 | ± | 0.08a | 1.52 | ± | 0.26a | 0.51 | ± | 0.17b | 1.37 | ± | 0.26a | **0.000** |
| Veillonellaceae | | | 0.92 | ± | 0.03ab | 1.17 | ± | 0.38a | 0.58 | ± | 0.05b | 1.38 | ± | 0.31a | **0.012** |
| Sphingomonadaceae | | | 0.52 | ± | 0.08a | 0.51 | ± | 0.15a | 0.18 | ± | 0.05b | 0.83 | ± | 0.15a | **0.000** |
| Idiomarinaceae | | | 5.48 | ± | 1.46a | 1.80 | ± | 0.90b | 1.14 | ± | 0.11b | 0.70 | ± | 0.17b | **0.000** |
| Marinobacteraceae | | | 1.10 | ± | 0.20ab | 3.20 | ± | 2.06a | 0.75 | ± | 0.19b | 0.35 | ± | 0.12b | **0.007** |
| Erwiniaceae | | | 1.20 | ± | 0.03 | 1.69 | ± | 0.97 | 1.02 | ± | 0.33 | 2.14 | ± | 0.14 | 0.082 |
| Halomonadaceae | | | 9.27 | ± | 3.49a | 4.43 | ± | 0.79b | 1.17 | ± | 0.18c | 1.91 | ± | 0.20bc | **0.000** |
| Pseudomonadaceae | | | 7.61 | ± | 2.70b | 0.71 | ± | 0.09c | 18.52 | ± | 2.84a | 5.61 | ± | 1.37b | **0.000** |
| Salinisphaeraceae | | | 0.62 | ± | 0.15a | 0.44 | ± | 0.16ab | 0.21 | ± | 0.12b | 0.19 | ± | 0.10b | **0.019** |
| Vibrionaceae | | | 9.57 | ± | 1.39b | 12.16 | ± | 0.85ab | 5.35 | ± | 0.51c | 10.26 | ± | 0.30b | **0.000** |
| **Genus** | | |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Curtobacterium | | | 0.74 | ± | 0.15 | 0.63 | ± | 0.20 | 0.42 | ± | 0.10 | 0.65 | ± | 0.20 | 0.196 |
| Zunongwangia | | | 0.32 | ± | 0.08b | 1.16 | ± | 0.45a | 0.34 | ± | 0.06b | 0.14 | ± | 0.04b | **0.000** |
| Halarcobacter | | | 0.23 | ± | 0.06ab | 0.55 | ± | 0.40a | 0.04 | ± | 0.06b | 0.00 | ± | 0.00ab | **0.023** |
| Bacillus | | | 0.00 | ± | 0.00c | 0.09 | ± | 0.15c | 37.87 | ± | 3.41a | 0.93 | ± | 0.21b | **0.000** |
| Lactobacillus | | | 22.55 | ± | 1.51ab | 28.20 | ± | 1.81a | 11.17 | ± | 2.40b | 28.86 | ± | 2.05a | **0.024** |
| Leuconostoc | | | 23.98 | ± | 1.59ab | 25.52 | ± | 2.03ab | 12.61 | ± | 1.68b | 28.60 | ± | 1.33a | **0.027** |
| Weissella | | | 9.78 | ± | 0.39b | 11.90 | ± | 1.04a | 5.99 | ± | 0.76c | 12.49 | ± | 0.18a | **0.000** |
| Lactococcus | | | 0.51 | ± | 0.27 | 0.66 | ± | 0.19 | 0.32 | ± | 0.12 | 0.49 | ± | 0.32 | 0.455 |
| Tepidimicrobium | | | 1.24 | ± | 0.07a | 1.54 | ± | 0.25a | 0.51 | ± | 0.17b | 1.39 | ± | 0.27a | **0.000** |
| Megasphaera | | | 0.94 | ± | 0.03ab | 1.19 | ± | 0.38a | 0.58 | ± | 0.05b | 1.40 | ± | 0.31a | **0.011** |
| Sphingomonas | | | 0.53 | ± | 0.09a | 0.52 | ± | 0.15a | 0.18 | ± | 0.05b | 0.84 | ± | 0.15a | **0.000** |
| Idiomarina | | | 5.60 | ± | 1.50a | 1.83 | ± | 0.93b | 1.15 | ± | 0.11b | 0.71 | ± | 0.17b | **0.000** |
| Marinobacter | | | 1.12 | ± | 0.20ab | 3.26 | ± | 2.12a | 0.76 | ± | 0.19b | 0.35 | ± | 0.12b | **0.007** |
| Chromohalobacter | | | 7.40 | ± | 4.31a | 2.97 | ± | 0.44ab | 0.91 | ± | 0.11b | 1.64 | ± | 0.32b | **0.004** |
| Halomonas | | | 1.70 | ± | 0.58a | 1.48 | ± | 0.83a | 0.28 | ± | 0.08b | 0.29 | ± | 0.13b | **0.003** |
| Pseudomonas | | | 7.77 | ± | 2.74b | 0.73 | ± | 0.09c | 18.67 | ± | 2.83a | 5.69 | ± | 1.39b | **0.000** |
| Salinisphaera | | | 0.64 | ± | 0.15a | 0.44 | ± | 0.16ab | 0.21 | ± | 0.12b | 0.20 | ± | 0.11b | **0.019** |
| Photobacterium | | | 8.14 | ± | 1.18b | 9.80 | ± | 1.75b | 4.41 | ± | 0.68a | 10.29 | ± | 0.34b | **0.000** |
| Salinivibrio | | | 1.30 | ± | 0.33a | 2.53 | ± | 1.46a | 0.90 | ± | 0.25ab | 0.12 | ± | 0.05b | **0.002** |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

**Supplementary Table 3.** Mean relative abundance (%) ± SD (n = 6) of the most prevalent phyla, orders, classes, families, and genera found in gut mucosa samples. Significant *p*-values are in bold (*p* < 0.05).

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **WT** | | | | | | | | | | | | | | | **HG** | | | | | | | | | | | | | | ***Sig.*** | | |
| **CTRL** | | | | **ORG** | | | | **PROB** | | | | **PHYTO** | | | **CTRL** | | | **ORG** | | | | **PROB** | | | | **PHYTO** | | | **Diet** | **Genotype** | **D\*G** |
| **Phylum** |  |  |  |  | |  |  |  | |  |  |  | |  |  |  |  |  | |  |  |  |  |  |  |  | |  |  |  |  |  |
| Actinobacteriota | 1.74 | ± | 1.02 | 1.86 | | ± | 1.25 | 3.14 | | ± | 3.29 | 4.28 | | ± | 3.29 | 1.08 | ± | 1.03 | | 1.84 | ± | 1.07 | 1.80 | ± | 2.01 | 2.00 | | ± | 1.13 | 0.243 | 0.090 | 0.744 |
| Bacteroidota | 1.34 | ± | 1.19 | 1.11 | | ± | 1.13 | 1.22 | | ± | 2.04 | 2.30 | | ± | 2.61 | 1.12 | ± | 0.88 | | 1.89 | ± | 1.55 | 0.71 | ± | 1.01 | 1.17 | | ± | 1.30 | 0.453 | 0.657 | 0.556 |
| Firmicutes | 5.10 | ± | 3.88 | 4.00 | | ± | 3.93 | 7.93 | | ± | 12.07 | 11.09 | | ± | 9.34 | 1.83 | ± | 1.72 | | 7.27 | ± | 7.51 | 10.48 | ± | 21.85 | 4.65 | | ± | 3.52 | 0.537 | 0.443 | 0.510 |
| Proteobacteria | 91.06 | ± | 6.10 | 92.77 | | ± | 6.00 | 87.44 | | ± | 17.63 | 81.92 | | ± | 14.97 | 95.92 | ± | 2.79 | | 88.79 | ± | 9.79 | 86.88 | ± | 24.69 | 92.08 | | ± | 4.09 | 0.358 | 0.590 | 0.546 |
| **Class** |  |  |  |  | |  |  |  | |  |  |  | |  |  |  |  |  | |  |  |  |  |  |  |  | |  |  |  |  |  |
| Actinobacteria | 1.73 | ± | 1.02 | 1.86 | | ± | 1.25 | 3.10 | | ± | 3.20 | 4.18 | | ± | 3.22 | 1.07 | ± | 1.02 | | 1.84 | ± | 1.07 | 1.80 | ± | 2.01 | 1.97 | | ± | 1.16 | 0.257 | 0.090 | 0.744 |
| Bacteroidia | 1.31 | ± | 1.18 | 1.02 | | ± | 1.04 | 1.22 | | ± | 2.04 | 2.30 | | ± | 2.62 | 1.07 | ± | 0.84 | | 1.68 | ± | 1.26 | 0.60 | ± | 0.87 | 1.13 | | ± | 1.20 | 0.447 | 0.596 | 0.524 |
| Bacilli | 3.57 | ± | 3.44 | 3.02 | | ± | 2.60 | 4.70 | | ± | 5.35 | 9.91 | | ± | 7.96 | 1.77 | ± | 1.70 | | 5.21 | ± | 4.63 | 9.68 | ± | 20.07 | 2.87 | | ± | 1.36 | 0.473 | 0.485 | 0.328 |
| Clostridia | 1.53 | ± | 3.27 | 0.87 | | ± | 1.26 | 3.24 | | ± | 6.86 | 1.13 | | ± | 1.83 | 0.05 | ± | 0.08 | | 2.03 | ± | 3.27 | 0.79 | ± | 1.79 | 1.79 | | ± | 3.72 | 0.714 | 0.467 | 0.417 |
| Alphaproteobacteria | 1.57 | ± | 1.88 | 1.29 | | ± | 1.17 | 1.09 | | ± | 1.42 | 3.13 | | ± | 2.42 | 2.95 | ± | 2.85 | | 1.87 | ± | 1.56 | 0.58 | ± | 0.62 | 0.51 | | ± | 0.52 | 0.251 | 0.376 | 0.040 |
| Gammaproteobacteria | 89.46 | ± | 6.36 | 91.48 | | ± | 7.13 | 86.37 | | ± | 18.99 | 78.85 | | ± | 16.95 | 93.00 | ± | 4.43 | | 86.92 | ± | 10.55 | 86.26 | ± | 24.98 | 91.60 | | ± | 4.07 | 0.748 | 0.394 | 0.492 |
| **Order** |  |  |  |  | |  |  |  | |  |  |  | |  |  |  |  |  | |  |  |  |  |  |  |  | |  |  |  |  |  |
| Flavobacteriales | 1.06 | ± | 1.27 | 0.44 | | ± | 0.37 | 0.90 | | ± | 1.59 | 1.57 | | ± | 1.88 | 0.93 | ± | 0.76 | | 1.30 | ± | 1.21 | 0.38 | ± | 0.46 | 0.83 | | ± | 1.13 | 0.579 | 0.844 | 0.404 |
| Lactobacillales | 0.35 | ± | 0.34b | 0.53 | | ± | 0.26ab | 0.49 | | ± | 0.57b | 2.13 | | ± | 1.78a | 0.32 | ± | 0.41ab | | 0.74 | ± | 0.61ab | 0.42 | ± | 0.62ab | 0.26 | | ± | 0.27b | 0.064 | **0.035** | **0.011** |
| Staphylococcales | 1.22 | ± | 1.18 | 1.65 | | ± | 2.04 | 2.40 | | ± | 2.38 | 5.99 | | ± | 6.20 | 0.76 | ± | 1.04 | | 3.06 | ± | 3.16 | 8.74 | ± | 19.79 | 1.53 | | ± | 0.75 | 0.420 | 0.876 | 0.457 |
| Clostridiales | 1.17 | ± | 2.85 | 0.53 | | ± | 0.86 | 2.63 | | ± | 6.42 | 0.42 | | ± | 1.00 | 0.00 | ± | 0.00 | | 1.23 | ± | 2.68 | 0.56 | ± | 1.35 | 1.51 | | ± | 3.70 | 0.841 | 0.680 | 0.785 |
| Sphingomonadales | 0.63 | ± | 1.00 | 0.25 | | ± | 0.20 | 0.20 | | ± | 0.47 | 0.50 | | ± | 0.71 | 2.06 | ± | 1.92 | | 0.70 | ± | 0.58 | 0.10 | ± | 0.10 | 0.11 | | ± | 0.13 | **0.007** | 0.288 | 0.169 |
| Alteromonadales | 6.82 | ± | 10.03 | 8.02 | | ± | 9.95 | 2.71 | | ± | 4.97 | 7.74 | | ± | 6.95 | 6.57 | ± | 6.10 | | 9.48 | ± | 12.76 | 2.02 | ± | 3.22 | 2.80 | | ± | 4.76 | 0.324 | 0.554 | 0.699 |
| Burkholderiales | 2.85 | ± | 1.12 | 2.22 | | ± | 2.31 | 8.28 | | ± | 7.30 | 5.64 | | ± | 7.97 | 12.12 | ± | 22.32 | | 3.60 | ± | 3.63 | 3.91 | ± | 4.37 | 7.58 | | ± | 8.67 | 0.643 | 0.620 | 0.430 |
| Enterobacterales | 1.40 | ± | 1.25 | 8.76 | | ± | 13.51 | 0.38 | | ± | 0.44 | 5.72 | | ± | 10.80 | 3.13 | ± | 3.23 | | 7.98 | ± | 11.64 | 3.43 | ± | 7.37 | 4.28 | | ± | 9.86 | 0.219 | 0.735 | 0.785 |
| Oceanospirillales | 7.74 | ± | 11.07 | 0.94 | | ± | 0.92 | 0.80 | | ± | 1.86 | 3.32 | | ± | 3.27 | 4.00 | ± | 8.09 | | 2.76 | ± | 4.93 | 1.07 | ± | 2.22 | 1.78 | | ± | 3.43 | 0.260 | 0.599 | 0.607 |
| Pseudomonadales | 14.17 | ± | 15.89 | 6.43 | | ± | 6.97 | 3.11 | | ± | 2.23 | 12.76 | | ± | 11.45 | 27.90 | ± | 22.82 | | 11.11 | ± | 10.92 | 3.99 | ± | 4.28 | 4.64 | | ± | 5.44 | **0.010** | 0.596 | 0.185 |
| Vibrionales | 56.49 | ± | 38.44 | 65.58 | | ± | 24.33 | 70.66 | | ± | 28.56 | 43.25 | | ± | 27.10 | 38.70 | ± | 41.25 | | 52.17 | ± | 29.31 | 71.90 | ± | 34.63 | 70.38 | | ± | 10.06 | 0.251 | 0.851 | 0.329 |
| Corynebacteriales | 0.43 | ± | 0.27 | 0.78 | | ± | 0.63 | 1.04 | | ± | 1.11 | 1.78 | | ± | 1.93 | 0.24 | ± | 0.33 | | 0.67 | ± | 0.59 | 0.65 | ± | 0.99 | 0.84 | | ± | 0.76 | 0.149 | 0.105 | 0.901 |
| Propionibacteriales | 0.68 | ± | 0.27 | 0.62 | | ± | 0.48 | 1.68 | | ± | 2.02 | 1.18 | | ± | 0.83 | 0.46 | ± | 0.58 | | 0.75 | ± | 0.59 | 0.83 | ± | 0.75 | 0.90 | | ± | 0.67 | 0.340 | 0.216 | 0.708 |
| Rhodobacterales | 0.19 | ± | 0.23 | 0.34 | | ± | 0.53 | 0.37 | | ± | 0.39 | 1.38 | | ± | 2.07 | 0.19 | ± | 0.26 | | 0.46 | ± | 0.60 | 0.15 | ± | 0.15 | 0.27 | | ± | 0.37 | 0.459 | 0.341 | 0.460 |
| Exiguobacterales | 1.23 | ± | 2.17 | 0.18 | | ± | 0.28 | 0.73 | | ± | 1.63 | 0.73 | | ± | 0.90 | 0.23 | ± | 0.36 | | 0.64 | ± | 1.41 | 0.20 | ± | 0.44 | 0.42 | | ± | 0.88 | 0.889 | 0.389 | 0.757 |
| **Family** |  |  |  |  | |  |  |  | |  |  |  | |  |  |  |  |  | |  |  |  |  |  |  |  | |  |  |  |  |  |
| Flavobacteriaceae | 0.94 | ± | 1.26 | 0.37 | | ± | 0.36 | 0.90 | | ± | 1.62 | 1.00 | | ± | 1.24 | 0.74 | ± | 0.66 | | 1.01 | ± | 1.15 | 0.34 | ± | 0.40 | 0.72 | | ± | 1.11 | 0.898 | 0.798 | 0.741 |
| Weeksellaceae | 0.09 | ± | 0.09ab | 0.05 | | ± | 0.04b | 0.01 | | ± | 0.01b | 0.62 | | ± | 0.73a | 0.19 | ± | 0.23ab | | 0.22 | ± | 0.18ab | 0.05 | ± | 0.12ab | 0.08 | | ± | 0.14b | **0.011** | 0.882 | **0.008** |
| Bacillaceae | 0.57 | ± | 0.46 | 0.48 | | ± | 0.37 | 0.88 | | ± | 1.43 | 0.91 | | ± | 0.40 | 0.43 | ± | 0.59 | | 0.80 | ± | 0.84 | 0.26 | ± | 0.22 | 0.62 | | ± | 0.84 | 0.544 | 0.193 | 0.543 |
| Streptococcaceae | 0.15 | ± | 0.24 | 0.35 | | ± | 0.27 | 0.31 | | ± | 0.32 | 1.27 | | ± | 1.33 | 0.09 | ± | 0.16 | | 0.59 | ± | 0.68 | 0.21 | ± | 0.17 | 0.15 | | ± | 0.16 | **0.029** | 0.134 | 0.091 |
| Staphylococcaceae | 1.23 | ± | 1.20 | 1.64 | | ± | 2.02 | 2.41 | | ± | 2.41 | 6.14 | | ± | 6.45 | 0.76 | ± | 1.05 | | 3.09 | ± | 3.21 | 8.81 | ± | 19.97 | 1.53 | | ± | 0.75 | 0.427 | 0.877 | 0.457 |
| Clostridiaceae | 1.18 | ± | 2.88 | 0.54 | | ± | 0.87 | 2.67 | | ± | 6.52 | 0.43 | | ± | 1.03 | 0.00 | ± | 0.00 | | 1.26 | ± | 2.76 | 0.56 | ± | 1.37 | 1.52 | | ± | 3.71 | 0.840 | 0.678 | 0.786 |
| Peptostreptococcales-Tissierellales | 0.05 | ± | 0.06 | 0.36 | | ± | 0.47 | 0.65 | | ± | 0.78 | 0.61 | | ± | 0.69 | 0.05 | ± | 0.08 | | 0.77 | ± | 0.96 | 0.24 | ± | 0.46 | 0.28 | | ± | 0.22 | 0.071 | 0.687 | 0.254 |
| Sphingomonadaceae | 0.64 | ± | 1.01 | 0.25 | | ± | 0.20 | 0.20 | | ± | 0.47 | 0.50 | | ± | 0.71 | 2.07 | ± | 1.94 | | 0.70 | ± | 0.59 | 0.10 | ± | 0.10 | 0.11 | | ± | 0.13 | **0.007** | 0.293 | 0.169 |
| Idiomarinaceae | 1.04 | ± | 1.89 | 0.33 | | ± | 0.41 | 0.17 | | ± | 0.26 | 1.33 | | ± | 1.26 | 0.50 | ± | 0.67 | | 1.08 | ± | 2.06 | 0.43 | ± | 0.86 | 0.61 | | ± | 1.24 | 0.734 | 0.758 | 0.477 |
| Pseudoalteromonadaceae | 4.39 | ± | 7.08 | 1.24 | | ± | 1.38 | 2.01 | | ± | 4.22 | 4.65 | | ± | 5.51 | 2.31 | ± | 2.34 | | 3.04 | ± | 4.98 | 1.11 | ± | 1.93 | 1.74 | | ± | 3.17 | 0.699 | 0.545 | 0.738 |
| Enterobacteriaceae | 1.25 | ± | 1.20 | 8.72 | | ± | 13.57 | 0.37 | | ± | 0.42 | 5.55 | | ± | 10.90 | 3.00 | ± | 3.14 | | 7.80 | ± | 11.75 | 3.35 | ± | 7.41 | 4.26 | | ± | 9.87 | 0.233 | 0.734 | 0.813 |
| Halomonadaceae | 6.68 | ± | 10.09 | 0.83 | | ± | 0.81 | 0.68 | | ± | 1.56 | 3.11 | | ± | 3.06 | 3.99 | ± | 8.13 | | 1.84 | ± | 2.92 | 0.90 | ± | 1.81 | 1.68 | | ± | 3.18 | 0.245 | 0.629 | 0.729 |
| Moraxellaceae | 9.19 | ± | 10.06 | 2.83 | | ± | 2.73 | 2.71 | | ± | 2.09 | 10.47 | | ± | 10.86 | 19.49 | ± | 16.96 | | 5.41 | ± | 3.10 | 3.23 | ± | 3.78 | 4.13 | | ± | 5.27 | **0.012** | 0.636 | 0.157 |
| Pseudomonadaceae | 5.13 | ± | 6.08 | 3.67 | | ± | 4.75 | 0.43 | | ± | 0.46 | 2.49 | | ± | 2.61 | 8.56 | ± | 7.15 | | 5.80 | ± | 9.74 | 0.79 | ± | 0.87 | 0.53 | | ± | 0.58 | **0.010** | 0.728 | 0.457 |
| Vibrionaceae | 56.92 | ± | 38.64 | 65.87 | | ± | 24.18 | 70.93 | | ± | 28.50 | 43.86 | | ± | 27.30 | 38.79 | ± | 41.35 | | 52.48 | ± | 29.30 | 71.98 | ± | 34.63 | 70.61 | | ± | 10.15 | 0.256 | 0.833 | 0.334 |
| Alcaligenaceae | 0.16 | ± | 0.20 | 0.09 | | ± | 0.19 | 0.04 | | ± | 0.08 | 0.53 | | ± | 1.06 | 2.31 | ± | 3.71 | | 0.20 | ± | 0.33 | 0.21 | ± | 0.40 | 0.01 | | ± | 0.02 | 0.067 | 0.240 | 0.057 |
| Xanthomonadaceae | 0.12 | ± | 0.13 | 0.07 | | ± | 0.12 | 0.00 | | ± | 0.00 | 0.43 | | ± | 0.53 | 0.55 | ± | 1.04 | | 0.02 | ± | 0.03 | 0.02 | ± | 0.05 | 0.01 | | ± | 0.02 | 0.050 | 0.589 | 0.109 |
| Corynebacteriaceae | 0.40 | ± | 0.24 | 0.73 | | ± | 0.58 | 1.04 | | ± | 1.12 | 1.73 | | ± | 1.84 | 0.24 | ± | 0.33 | | 0.64 | ± | 0.55 | 0.63 | ± | 0.97 | 0.85 | | ± | 0.76 | 0.144 | 0.120 | 0.901 |
| Micrococcaceae | 0.59 | ± | 0.73 | 0.32 | | ± | 0.34 | 0.22 | | ± | 0.27 | 0.82 | | ± | 0.74 | 0.30 | ± | 0.34 | | 0.34 | ± | 0.20 | 0.24 | ± | 0.34 | 0.19 | | ± | 0.15 | 0.415 | 0.201 | 0.260 |
| Propionibacteriaceae | 0.68 | ± | 0.27 | 0.63 | | ± | 0.49 | 1.70 | | ± | 2.06 | 1.21 | | ± | 0.85 | 0.46 | ± | 0.59 | | 0.76 | ± | 0.61 | 0.84 | ± | 0.75 | 0.90 | | ± | 0.67 | 0.342 | 0.211 | 0.707 |
| Deinococcaceae | 0.61 | ± | 1.10 | 0.19 | | ± | 0.24 | 0.28 | | ± | 0.42 | 0.15 | | ± | 0.25 | 0.03 | ± | 0.03 | | 0.15 | ± | 0.19 | 0.10 | ± | 0.15 | 0.07 | | ± | 0.16 | 0.788 | 0.092 | 0.639 |
| Neisseriaceae | 2.23 | ± | 1.42 | 1.60 | | ± | 1.84 | 8.12 | | ± | 7.18 | 3.08 | | ± | 2.73 | 0.95 | ± | 0.95 | | 2.07 | ± | 2.67 | 3.08 | ± | 4.01 | 7.03 | | ± | 8.70 | 0.086 | 0.446 | 0.238 |
| Cyanobiaceae | 0.02 | ± | 0.03 | 0.07 | | ± | 0.16 | 0.60 | | ± | 1.42 | 0.37 | | ± | 0.62 | 0.09 | ± | 0.12 | | 0.07 | ± | 0.14 | 0.01 | ± | 0.02 | 0.05 | | ± | 0.12 | 0.881 | 0.286 | 0.293 |
| Rhodobacteraceae | 0.19 | ± | 0.23 | 0.35 | | ± | 0.54 | 0.38 | | ± | 0.39 | 1.42 | | ± | 2.14 | 0.19 | ± | 0.26 | | 0.46 | ± | 0.60 | 0.15 | ± | 0.15 | 0.27 | | ± | 0.37 | 0.455 | 0.335 | 0.451 |
| Shewanellaceae | 0.80 | ± | 0.66 | 5.97 | | ± | 8.99 | 0.25 | | ± | 0.22 | 1.15 | | ± | 0.89 | 3.44 | ± | 5.37 | | 4.79 | ± | 9.89 | 0.29 | ± | 0.33 | 0.22 | | ± | 0.22 | 0.123 | 0.808 | 0.690 |
| Comamonadaceae | 0.39 | ± | 0.79 | 0.48 | | ± | 0.47 | 0.17 | | ± | 0.15 | 1.98 | | ± | 4.58 | 8.76 | ± | 19.01 | | 1.31 | ± | 1.19 | 0.59 | ± | 0.91 | 0.50 | | ± | 0.81 | 0.481 | 0.160 | 0.290 |
| Alcanivoracaceae1 | 0.99 | ± | 2.11 | 0.04 | | ± | 0.08 | 0.00 | | ± | 0.00 | 0.05 | | ± | 0.07 | 0.02 | ± | 0.04 | | 0.44 | ± | 1.07 | 0.07 | ± | 0.18 | 0.08 | | ± | 0.19 | 0.541 | 0.553 | 0.207 |
| Exiguobacteraceae | 1.25 | ± | 2.20 | 0.18 | | ± | 0.29 | 0.75 | | ± | 1.66 | 0.75 | | ± | 0.93 | 0.24 | ± | 0.36 | | 0.65 | ± | 1.45 | 0.20 | ± | 0.44 | 0.42 | | ± | 0.88 | 0.889 | 0.386 | 0.753 |
| Genus |  |  |  |  | |  |  |  | |  |  |  | |  |  |  |  |  | |  |  |  |  |  |  |  | |  |  |  |  |  |
| Streptococcus | 0.15 | ± | 0.24 | 0.34 | | ± | 0.27 | 0.31 | | ± | 0.33 | 1.17 | | ± | 1.35 | 0.07 | ± | 0.15 | | 0.59 | ± | 0.69 | 0.20 | ± | 0.16 | 0.16 | | ± | 0.17 | **0.031** | 0.159 | 0.154 |
| Staphylococcus | 1.24 | ± | 1.21 | 1.62 | | ± | 1.99 | 2.44 | | ± | 2.46 | 6.08 | | ± | 6.42 | 0.76 | ± | 1.06 | | 3.13 | ± | 3.28 | 8.80 | ± | 19.95 | 1.56 | | ± | 0.75 | 0.898 | 0.432 | 0.476 |
| Idiomarina | 1.04 | ± | 1.89 | 0.32 | | ± | 0.41 | 0.17 | | ± | 0.26 | 1.33 | | ± | 1.26 | 0.50 | ± | 0.67 | | 1.08 | ± | 2.07 | 0.43 | ± | 0.86 | 0.61 | | ± | 1.25 | 0.762 | 0.736 | 0.478 |
| Pseudoalteromonas | 4.39 | ± | 7.09 | 1.23 | | ± | 1.39 | 2.06 | | ± | 4.34 | 4.63 | | ± | 5.48 | 2.31 | ± | 2.34 | | 3.07 | ± | 5.01 | 1.11 | ± | 1.92 | 1.76 | | ± | 3.20 | 0.549 | 0.704 | 0.739 |
| Cobetia | 4.39 | ± | 6.18 | 0.60 | | ± | 0.62 | 0.59 | | ± | 1.35 | 2.24 | | ± | 2.21 | 1.91 | ± | 3.43 | | 1.64 | ± | 2.70 | 0.79 | ± | 1.61 | 1.46 | | ± | 3.05 | 0.389 | 0.660 | 0.614 |
| Halomonas | 1.95 | ± | 3.57 | 0.11 | | ± | 0.15 | 0.10 | | ± | 0.25 | 0.41 | | ± | 0.48 | 1.95 | ± | 4.65 | | 0.07 | ± | 0.06 | 0.04 | ± | 0.06 | 0.11 | | ± | 0.14 | 0.119 | 0.491 | 0.925 |
| Psychrobacter | 4.63 | ± | 7.35 | 0.68 | | ± | 0.82 | 0.99 | | ± | 2.17 | 1.59 | | ± | 1.75 | 3.68 | ± | 7.99 | | 0.96 | ± | 1.11 | 0.47 | ± | 0.59 | 0.73 | | ± | 1.14 | 0.411 | 0.604 | 0.881 |
| Pseudomonas | 5.08 | ± | 6.02 | 3.57 | | ± | 4.60 | 0.43 | | ± | 0.46 | 2.49 | | ± | 2.62 | 8.55 | ± | 7.12 | | 5.84 | ± | 9.80 | 0.79 | ± | 0.87 | 0.52 | | ± | 0.59 | **0.010** | 0.716 | 0.438 |
| Photobacterium | 0.44 | ± | 0.62 | 0.08 | | ± | 0.08 | 0.16 | | ± | 0.27 | 0.55 | | ± | 0.63 | 0.08 | ± | 0.19 | | 0.10 | ± | 0.13 | 0.03 | ± | 0.06 | 0.10 | | ± | 0.15 | 0.544 | **0.040** | 0.359 |
| Vibrio | 56.45 | ± | 39.13 | 59.19 | | ± | 26.05 | 70.85 | | ± | 28.65 | 43.25 | | ± | 27.97 | 38.81 | ± | 41.54 | | 51.96 | ± | 30.05 | 69.27 | ± | 35.11 | 50.82 | | ± | 28.82 | 0.237 | 0.554 | 0.841 |
| Stenotrophomonas | 0.06 | ± | 0.09 | 0.06 | | ± | 0.12 | 0.00 | | ± | 0.00 | 0.25 | | ± | 0.48 | 0.54 | ± | 1.03 | | 0.02 | ± | 0.03 | 0.02 | ± | 0.05 | 0.00 | | ± | 0.00 | 0.106 | 0.983 | 0.096 |
| Corynebacterium | 0.37 | ± | 0.28 | 0.62 | | ± | 0.48 | 0.53 | | ± | 0.57 | 1.25 | | ± | 1.22 | 0.20 | ± | 0.29 | | 0.55 | ± | 0.55 | 0.55 | ± | 0.79 | 0.67 | | ± | 0.64 | 0.188 | 0.132 | 0.896 |
| Lawsonella | 0.04 | ± | 0.09 | 0.11 | | ± | 0.18 | 0.53 | | ± | 0.61 | 0.49 | | ± | 0.71 | 0.04 | ± | 0.06 | | 0.09 | ± | 0.08 | 0.08 | ± | 0.19 | 0.19 | | ± | 0.18 | 0.166 | 0.300 | 0.310 |
| Cutibacterium | 0.68 | ± | 0.27 | 0.63 | | ± | 0.48 | 1.72 | | ± | 2.12 | 1.21 | | ± | 0.85 | 0.46 | ± | 0.59 | | 0.77 | ± | 0.61 | 0.84 | ± | 0.75 | 0.92 | | ± | 0.69 | 0.336 | 0.223 | 0.697 |
| Deinococcus | 0.61 | ± | 1.10 | 0.19 | | ± | 0.24 | 0.29 | | ± | 0.43 | 0.15 | | ± | 0.25 | 0.03 | ± | 0.03 | | 0.15 | ± | 0.19 | 0.10 | ± | 0.15 | 0.08 | | ± | 0.18 | 0.800 | 0.095 | 0.641 |
| Novosphingobium | 0.34 | ± | 0.52 | 0.05 | | ± | 0.06 | 0.19 | | ± | 0.45 | 0.07 | | ± | 0.14 | 0.71 | ± | 0.64 | | 0.31 | ± | 0.30 | 0.07 | ± | 0.07 | 0.06 | | ± | 0.12 | **0.016** | 0.161 | 0.572 |
| Sphingobium | 0.25 | ± | 0.45 | 0.08 | | ± | 0.09 | 0.02 | | ± | 0.04 | 0.23 | | ± | 0.57 | 1.24 | ± | 1.44 | | 0.24 | ± | 0.28 | 0.00 | ± | 0.01 | 0.02 | | ± | 0.06 | **0.006** | 0.272 | 0.211 |
| Escherichia-Shigella | 0.10 | ± | 0.09 | 8.15 | | ± | 13.98 | 0.02 | | ± | 0.04 | 4.78 | | ± | 11.24 | 0.14 | ± | 0.24 | | 6.72 | ± | 11.90 | 3.13 | ± | 7.52 | 4.11 | | ± | 9.88 | 0.231 | 0.829 | 0.905 |
| Acinetobacter | 4.29 | ± | 3.43ab | 1.96 | | ± | 2.13ab | 1.67 | | ± | 1.37b | 8.58 | | ± | 11.05ab | 15.71 | ± | 13.51a | | 4.20 | ± | 2.12ab | 2.67 | ± | 3.19b | 3.17 | | ± | 4.89ab | **0.020** | 0.315 | **0.046** |
| Prochlorococcus\_MIT9313 | 0.01 | ± | 0.01 | 0.03 | | ± | 0.07 | 0.61 | | ± | 1.46 | 0.19 | | ± | 0.47 | 0.02 | ± | 0.04 | | 0.00 | ± | 0.00 | 0.01 | ± | 0.02 | 0.02 | | ± | 0.04 | 0.611 | 0.169 | 0.560 |
| Shewanella | 0.80 | ± | 0.66 | 5.89 | | ± | 8.88 | 0.25 | | ± | 0.22 | 1.15 | | ± | 0.90 | 3.46 | ± | 5.40 | | 4.82 | ± | 9.96 | 0.29 | ± | 0.34 | 0.22 | | ± | 0.22 | 0.124 | 0.818 | 0.689 |
| Delftia | 0.36 | ± | 0.79 | 0.46 | | ± | 0.44 | 0.10 | | ± | 0.14 | 1.98 | | ± | 4.60 | 8.73 | ± | 19.04 | | 1.24 | ± | 1.17 | 0.59 | ± | 0.91 | 0.46 | | ± | 0.75 | 0.472 | 0.139 | 0.278 |
| Enterovibrio | 0.00 | ± | 0.00b | 6.47 | | ± | 7.77ab | 0.03 | | ± | 0.05ab | 0.15 | | ± | 0.35b | 0.01 | ± | 0.02b | | 0.67 | ± | 1.33ab | 2.81 | ± | 6.23ab | 21.17 | | ± | 33.71a | 0.106 | 0.224 | **0.028** |
| Alcanivorax | 1.00 | ± | 2.12 | 0.04 | | ± | 0.08 | 0.00 | | ± | 0.00 | 0.05 | | ± | 0.07 | 0.02 | ± | 0.04 | | 0.44 | ± | 1.08 | 0.07 | ± | 0.18 | 0.08 | | ± | 0.19 | 0.542 | 0.556 | 0.207 |
| Exiguobacterium | 1.25 | ± | 2.20 | 0.18 | | ± | 0.28 | 0.76 | | ± | 1.70 | 0.75 | | ± | 0.92 | 0.24 | ± | 0.36 | | 0.66 | ± | 1.46 | 0.20 | ± | 0.44 | 0.43 | | ± | 0.89 | 0.892 | 0.386 | 0.752 |