**Table S1** Major genera (n > 10) detected in the pyrotag sequencing of 16S rRNA-gene amplicons for the original activated sludge, anode and cathode biofilms and planktonic cells in the electrolyte.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Taxonomic group | Activated sludge | Anode biofilm | Cathode biofilm | Electrolyte |
| No. | % | No. | % | No. | % | No. | % |
| *Acetivibrio* | 0 | 0.0  | 22 | 1.0  | 96 | 1.2  | 87 | 1.0  |
| *Acholeplasma* | 25 | 0.5  | 0 | 0.0  | 0 | 0.0  | 0 | 0.0  |
| *Achromobacter* | 0 | 0.0  | 1 | 0.0  | 52 | 0.7  | 4 | 0.0  |
| *Albibacter* | 0 | 0.0  | 5 | 0.2  | 1 | 0.0  | 16 | 0.2  |
| *Anaerostipes* | 0 | 0.0  | 0 | 0.0  | 64 | 0.8  | 0 | 0.0  |
| *Anaerovorax* | 7 | 0.1  | 24 | 1.1  | 75 | 0.9  | 163 | 1.9  |
| *Ancylobacter* | 0 | 0.0  | 17 | 0.8  | 104 | 1.3  | 173 | 2.0  |
| *Aquicella* | 16 | 0.3  | 0 | 0.0  | 0 | 0.0  | 0 | 0.0  |
| *Arcobacter* | 18 | 0.3  | 0 | 0.0  | 0 | 0.0  | 0 | 0.0  |
| *Arenimonas* | 53 | 1.0  | 0 | 0.0  | 0 | 0.0  | 0 | 0.0  |
| *Bellilinea* | 0 | 0.0  | 59 | 2.6  | 11 | 0.1  | 81 | 0.9  |
| *Caedibacter* | 0 | 0.0  | 2 | 0.1  | 26 | 0.3  | 7 | 0.1  |
| *Clostridium* | 0 | 0.0  | 85 | 3.8  | 15 | 0.2  | 104 | 1.2  |
| *Cryptanaerobacter* | 0 | 0.0  | 6 | 0.3  | 8 | 0.1  | 18 | 0.2  |
| *Dendrosporobacter* | 0 | 0.0  | 0 | 0.0  | 4 | 0.1  | 40 | 0.5  |
| *Desulfomicrobium* | 0 | 0.0  | 2 | 0.1  | 0 | 0.0  | 4 | 0.0  |
| *Desulfosporosinus* | 179 | 3.5  | 20 | 0.9  | 20 | 0.3  | 62 | 0.7  |
| *Desulfovibrio* | 0 | 0.0  | 123 | 5.5  | 409 | 5.1  | 1285 | 14.9  |
| *Dysgonomonas* | 0 | 0.0  | 470 | 21.0  | 2558 | 32.0  | 972 | 11.3  |
| *Ferruginibacter* | 149 | 2.9  | 0 | 0.0  | 1 | 0.0  | 0 | 0.0  |
| *Fusibacter* | 304 | 5.9  | 0 | 0.0  | 0 | 0.0  | 0 | 0.0  |
| *Gemmatimonas* | 13 | 0.3  | 0 | 0.0  | 0 | 0.0  | 0 | 0.0  |
| *Geobacter* | 0 | 0.0  | 129 | 5.8  | 0 | 0.0  | 16 | 0.2  |
| Gp4 | 30 | 0.6  | 0 | 0.0  | 0 | 0.0  | 1 | 0.0  |
| *Gracilibacter* | 0 | 0.0  | 9 | 0.4  | 9 | 0.1  | 21 | 0.2  |
| *Haliscomenobacter* | 85 | 1.6  | 0 | 0.0  | 0 | 0.0  | 0 | 0.0  |
| *Hoyosella* | 34 | 0.7  | 1 | 0.0  | 0 | 0.0  | 0 | 0.0  |
| *Hydrogenoanaerobacterium* | 0 | 0.0  | 0 | 0.0  | 2 | 0.0  | 10 | 0.1  |
| *Hydrogenophaga* | 91 | 1.8  | 0 | 0.0  | 4 | 0.1  | 3 | 0.0  |
| *Hyphomicrobium* | 4 | 0.1  | 10 | 0.4  | 20 | 0.3  | 43 | 0.5  |
| *Hyphomonas* | 10 | 0.2  | 1 | 0.0  | 0 | 0.0  | 0 | 0.0  |
| *Legionella* | 28 | 0.5  | 0 | 0.0  | 13 | 0.2  | 5 | 0.1  |
| *Marinomonas* | 640 | 12.4  | 1 | 0.0  | 0 | 0.0  | 0 | 0.0  |
| *Methylobacillus* | 0 | 0.0  | 1 | 0.0  | 5 | 0.1  | 0 | 0.0  |
| *Micropruina* | 0 | 0.0  | 1 | 0.0  | 1 | 0.0  | 25 | 0.3  |
| *Nitrosococcus* | 10 | 0.2  | 0 | 0.0  | 0 | 0.0  | 0 | 0.0  |
| *Nitrospira* | 23 | 0.4  | 0 | 0.0  | 0 | 0.0  | 0 | 0.0  |
| OD1 | 25 | 0.5  | 0 | 0.0  | 0 | 0.0  | 0 | 0.0  |
| *Oscillibacter* | 0 | 0.0  | 7 | 0.3  | 1 | 0.0  | 20 | 0.2  |
| *Owenweeksia* | 54 | 1.0  | 0 | 0.0  | 0 | 0.0  | 0 | 0.0  |
| *Parabacteroides* | 1 | 0.0  | 46 | 2.1  | 82 | 1.0  | 524 | 6.1  |

**Table S1** Continued.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Taxonomic group | Activated sludge | Anode biofilm | Cathode biofilm | Electrolyte |
| No. | % | No. | % | No. | % | No. | % |
| *Paracoccus* | 11 | 0.2  | 4 | 0.2  | 3 | 0.0  | 7 | 0.1  |
| *Petrimonas* | 0 | 0.0  | 7 | 0.3  | 0 | 0.0  | 2 | 0.0  |
| *Pleomorphomonas* | 0 | 0.0 | 11 | 0.5 | 384 | 4.8 | 25 | 0.3 |
| *Proteocatella* | 41 | 0.8  | 0 | 0.0  | 0 | 0.0  | 0 | 0.0  |
| *Pseudomonas* | 277 | 5.3  | 0 | 0.0  | 2 | 0.0  | 0 | 0.0  |
| *Pseudoxanthomonas* | 0 | 0.0  | 10 | 0.4  | 146 | 1.8  | 42 | 0.5  |
| *Rhizobium* | 0 | 0.0  | 2 | 0.1  | 31 | 0.4  | 6 | 0.1  |
| *Sedimentibacter* | 24 | 0.5  | 0 | 0.0  | 0 | 0.0  | 0 | 0.0  |
| *Shewanella* | 135 | 2.6  | 0 | 0.0  | 0 | 0.0  | 0 | 0.0  |
| *Simplicispira* | 16 | 0.3  | 0 | 0.0  | 0 | 0.0  | 0 | 0.0  |
| *Sporacetigenium* | 202 | 3.9  | 8 | 0.4  | 2 | 0.0  | 3 | 0.0  |
| *Sporomusa* | 0 | 0.0  | 370 | 16.5  | 1725 | 21.6  | 1558 | 18.1  |
| *Sporotalea* | 0 | 0.0  | 38 | 1.7  | 6 | 0.1  | 0 | 0.0  |
| *Stenotrophomonas* | 0 | 0.0  | 0 | 0.0  | 12 | 0.2  | 0 | 0.0  |
| *Sulfurimonas* | 117 | 2.3  | 0 | 0.0  | 0 | 0.0  | 0 | 0.0  |
| TM7 | 12 | 0.2  | 0 | 0.0  | 0 | 0.0  | 1 | 0.0  |
| *Terrimonas* | 3 | 0.1  | 1 | 0.0  | 10 | 0.1  | 1 | 0.0  |
| *Thauera* | 63 | 1.2  | 2 | 0.1  | 0 | 0.0  | 1 | 0.0  |
| *Thiobacillus* | 18 | 0.3  | 2 | 0.1  | 0 | 0.0  | 0 | 0.0  |
| *Thiomonas* | 0 | 0.0  | 30 | 1.3  | 19 | 0.2  | 116 | 1.3  |
| *Tissierella* | 23 | 0.4  | 0 | 0.0  | 1 | 0.0  | 1 | 0.0  |
| *Truepera* | 34 | 0.7  | 2 | 0.1  | 0 | 0.0  | 0 | 0.0  |
| *Xanthobacter* | 0 | 0.0  | 8 | 0.4  | 184 | 2.3  | 5 | 0.1  |
| Others | 2406 | 46.4  | 746 | 33.3  | 1890 | 23.6  | 3158 | 36.7  |
| Total | 5181 | 100.0  | 2283 | 100.0  | 7996 | 100.0  | 8610 | 100.0  |