|  |  |  |  |
| --- | --- | --- | --- |
| **Process** | **Gene** | **KO** | **present/absent** |
| Aerobic C fixation | RuBisCo small chain (*rbc*S) | K01602 | present |
| phosphoribulose kinase (*prk*A) | K00855 | present |
| Respiration | cytochrome C oxidase (*cox*I, *cox*III, *cox*A, *cox*C) | K02256 | present |
| K02262 | present |
| K02274 | present |
| K02276 | present |
| Anaerobic C fixation | ATP citrate lyase  2-oxogluterate:ferredoxin oxidoreductase  fumerate reductase (*frd*A)  CO dehydrogenase | K01648  K00174  K00175  K00244  K00194  K00197 |  |
| Fermentation | L-lactate dehydrogenase  pyruvate:ferredoxin oxidoreductase | K00016  K00169  K00170 |  |
| CO oxidation | carbon-monoxide dehydrogenase (*cox*S, *cox*M, *cox*L) | K03518  K03519  K03520 |  |
| Methanogenesis | coenzyme M methyl reductase (*mcr*B)  methyl coenzyme M reductase system | K00401  K00400 |  |
|  |  |  |  |
| N fixation | nitrogenase (*nif*D, *nif*H, *nif*K) | K02586  K02588  K02591 |  |
| Denitrification | nitric oxide reductase (*nor*B, *nor*C) | K02305  K04561 |  |
| nitrous oxide reductase (*nos*Z) | K00376 |
| DNRA | nitrite reductase (*nrf*A) | K03385 |  |
| Anammox | hydroxylamine oxidase | K10535 |  |
| N mineralization | glutamate dehydrogenase (*gdh*A) | K00260  K00261  K00262 |  |
| N assimilation | assimilatory nitrate reductase | K00360 |  |
| glutamine synthetase (*gln*A, *glt*B, *glt*S) | K01915  K00265  K00284 |  |
| ASR | Adenyl sulfate kinase (*cys*C)  Sulfate adenylyltransferase (*cys*N, *cys*D) | K00860  K00956  K00957 |  |
| DSR | APS reductase (*apr*A) | K00394 |  |
| S mineralization | Cysteine diogenase  3-Mercaptopyruvate sulfurtransferase | K00456  K01011 |  |
| DMS oxidation | DMS monooxygenase | - |  |
| DMSO reduction |  | - |  |
| DMSP cleavage | DMSP lyase  (*ddd*D, *ddd*L, *ddd*P) | - |  |

Table 2.Full list of KEGG Orthologs searched for in Organic Lake profile metagenome.