

SUPPLEMENTALS

Table s1: Primers used for the V4-V5 amplification and the associated PCR program.

Bacteria	
Forward primer	515f GTGYCAGCMGCCGCGGTA
Reverse Primer	928r CCCGYCAATTCMTTTRAGT
Program	95°c 3mn -----x32----- 98°c 20s 65°c 40s 72°c 30s ----- 72°c. 10mn

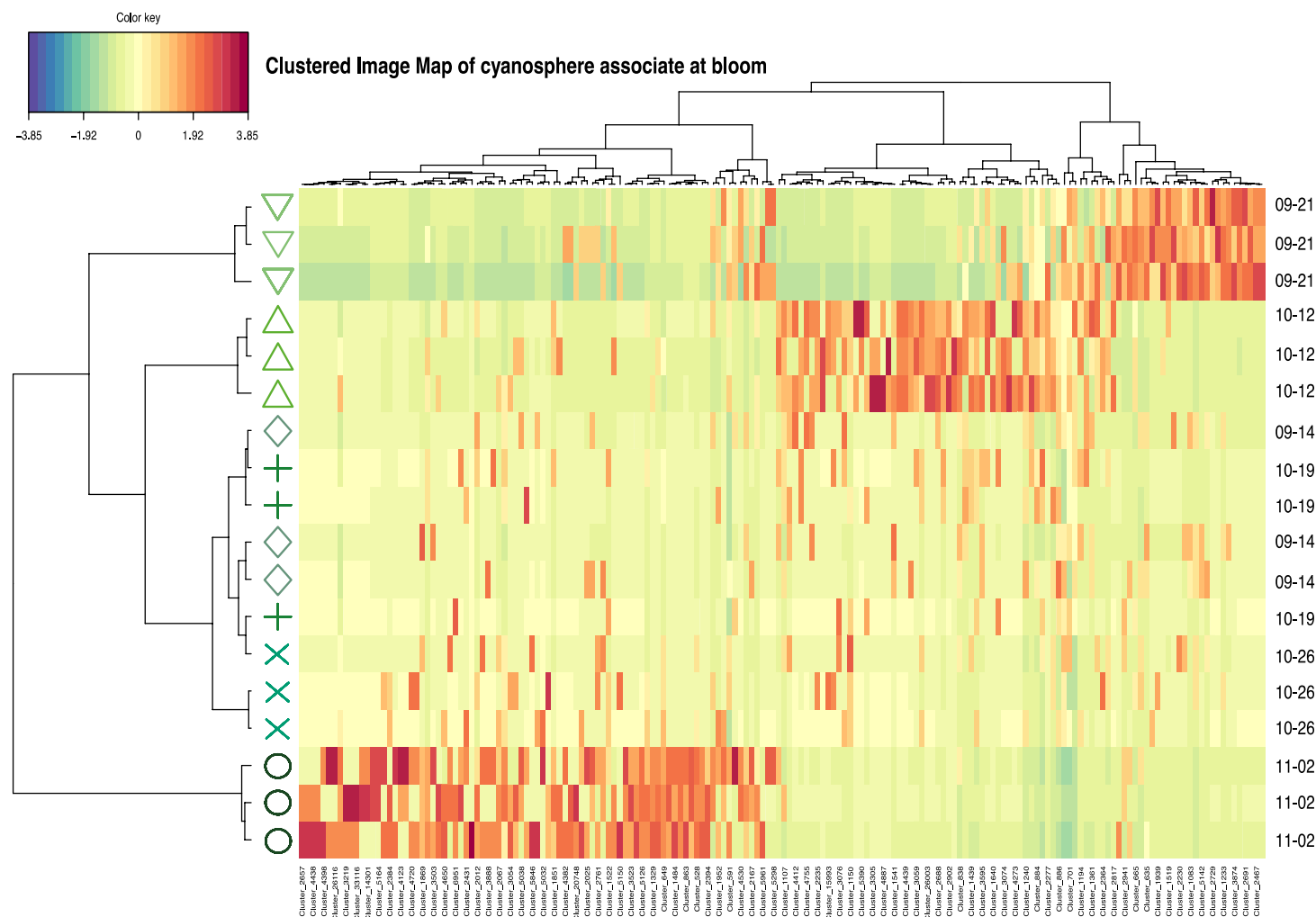


Figure s1: Clustered Image Map of the OTUs selected by sPLS-DA on the attached fraction.

CIM is a hierarchical clustering based on the OTUs contribution levels of the attached fraction, with samples in rows coloured according to the sampling date.

Table s2: Distribution of discriminating OTUs in the 3 phases: growing, declining and end of bloom.
For each OTUs, we searched if their known to have relevant features in environments.

	Observation_name	Phylum	Class	Order	Family	Genus	Features	References
G R O W I N G P H A S E (0 9 - 2 1)	Cluster_3874	Chloroflexi	Anaerolineae	-	-	-	-	-
	Cluster_1012	Candidate WPS-2	unknown class	-	-	-	-	-
	Cluster_1422	Myxococota	Polyangia	-	-	-	-	-
	Cluster_2039	Bacteroidota	Bacteroidia	Chitinophagales	-	-	-	-
	Cluster_3210	Actinobacteriota	Thermoleophilii	Gaiellales	-	-	-	-
	Cluster_5961	Planctomycetota	Planctomycetes	Planctomycetales	-	-	-	-
	Cluster_2860	Chloroflexi	Chloroflexia	Thermomicrobiales	-	-	-	-
	Cluster_5298	Proteobacteria	Alphaproteobacteria	Acetobacterales	Acetobacteraceae	-	-	-
	Cluster_3113	Proteobacteria	Alphaproteobacteria	Acetobacterales	Acetobacteraceae	Belnapia	-	-
	Cluster_2439	Proteobacteria	Alphaproteobacteria	Acetobacterales	Acetobacteraceae	Rubritelpida	-	-
	Cluster_822	Bacteroidota	Bacteroidia	Chitinophagales	Chitinophagaceae	Cnuella	-	-
	Cluster_687	Bacteroidota	Bacteroidia	Chitinophagales	Chitinophagaceae	Cnuella	-	-
	Cluster_1502	Bacteroidota	Bacteroidia	Chitinophagales	Chitinophagaceae	Flavitalea	-	-
	Cluster_1557	Bacteroidota	Bacteroidia	Chitinophagales	Chitinophagaceae	Edaphobaculum	-	-
	Cluster_1551	Planctomycetota	Planctomycetes	Isosphaerales	Isosphaeraceae	Candidatus Nostocoida	-	-
	Cluster_3131	Proteobacteria	Alphaproteobacteria	Rhodobacterales	Rhodobacteraceae	Rubellimicrobium	-	-
	Cluster_1233	Proteobacteria	Alphaproteobacteria	Rhodobacterales	Rhodobacteraceae	Rubellimicrobium	-	-
	Cluster_2230	Proteobacteria	Alphaproteobacteria	Rhodobacterales	Rhodobacteraceae	Rubellimicrobium	-	-
	Cluster_2958	Actinobacteriota	Thermoleophilii	Solirubrobacterales	Solirubrobacteraceae	Solirubrobacter	-	-
	Cluster_1243	Bacteroidota	Bacteroidia	Cytophagales	Spirosomaceae	Rhabdobacter	-	-
	Cluster_2691	Bacteroidota	Bacteroidia	Cytophagales	Spirosomaceae	Rudanella	-	-
	Cluster_2075	Proteobacteria	Gammmaproteobacteria	Burkholderiales	Sutterellaceae	-	-	-
	Cluster_1498	Proteobacteria	Gammmaproteobacteria	Burkholderiales	Nitrosomonadaceae	Nitrosospira	Ammonium oxidizing bacteria	Pertti et al., 1984
	Cluster_3538	Bacteroidota	Bacteroidia	Chitinophagales	Chitinophagaceae	Flavisolibacter	Associate to other bacteria in process of denitrification ; Breakdown organic C	Liu et al., 2014
	Cluster_1519	Bacteroidota	Bacteroidia	Chitinophagales	Chitinophagaceae	Flavisolibacter	Associate to other bacteria in process of denitrification ; Breakdown organic C	Liu et al., 2014
	Cluster_701	Bacteroidota	Bacteroidia	Chitinophagales	Chitinophagaceae	Flavisolibacter	Associate to other bacteria in process of denitrification ; Breakdown organic C	Liu et al., 2014
	Cluster_2671	Planctomycetota	Planctomycetes	Gemmatales	Gemmataceae	Fimbriglobus	Chitinolytic activities	Ravin et al., 2018
	Cluster_1415	Planctomycetota	Planctomycetes	Gemmatales	Gemmataceae	Fimbriglobus	Chitinolytic activities	Ravin et al., 2018
	Cluster_665	Proteobacteria	Gammmaproteobacteria	Pseudomonadales	Moraxellaceae	Alkanindiges	Consuming lipids ; Foam formation	Klein et al., 2007
	Cluster_3019	Actinobacteriota	Actinobacteria	Propionibacterales	Nocardioidaceae	Nocardioides	Degradation of complex organic matter-†	Yoon and Park., 2006
	Cluster_4465	Proteobacteria	Alphaproteobacteria	Sphingomonadales	Sphingomonadaceae	Sphingomonas	Degradation of Microcystin ; Biodegrade refractory organic compounds	Valeria et al., 2006 ; White et al., 1996
	Cluster_1474	Proteobacteria	Alphaproteobacteria	Sphingomonadales	Sphingomonadaceae	Sphingomonas	Degradation of Microcystin ; Biodegrade refractory organic compounds	Valeria et al., 2006 ; White et al., 1996
	Cluster_24856	Proteobacteria	Alphaproteobacteria	Sphingomonadales	Sphingomonadaceae	Sphingomonas	Degradation of Microcystin ; Biodegrade refractory organic compounds	Valeria et al., 2006 ; White et al., 1996
	Cluster_10568	Proteobacteria	Alphaproteobacteria	Sphingomonadales	Sphingomonadaceae	Sphingomonas	Degradation of Microcystin ; Biodegrade refractory organic compounds	Valeria et al., 2006 ; White et al., 1996
	Cluster_635	Proteobacteria	Alphaproteobacteria	Sphingomonadales	Sphingomonadaceae	Sphingomonas	Degradation of Microcystin ; Biodegrade refractory organic compounds	Valeria et al., 2006 ; White et al., 1996
	Cluster_2953	Acidobacteriota	Blastocatellia	Blastocatellales	Blastocatellaceae	Blastocatella	Degradation of NH4+	Ouyang et al., 2017
	Cluster_1149	Actinobacteriota	Thermoleophilii	Solirubrobacterales	Solirubrobacteraceae	Conexibacter	Degrades lincosmycin	Lei et al., 2022
	Cluster_920	Gemmatimonadota	Gemmatimonadetes	Gemmatimonadales	Gemmatimonadaceae	-	Denitrification	Jia et al., 2019
	Cluster_703	Proteobacteria	Alphaproteobacteria	Rhodobacterales	Rhodobacteraceae	Paracoccus	Denitrification ; Biofilm formation	Kumar & Spiro, 2017
	Cluster_6116	Proteobacteria	Gammmaproteobacteria	Burkholderiales	Comamonadaceae	Comamonas	Denitrification and ammonification	Wu et al., 2018
	Cluster_1083	Proteobacteria	Gammmaproteobacteria	Burkholderiales	Oxalobacteraceae	Noviherbaspirillum	Denitrifying bacteria	Ishii et al., 2017
	Cluster_734	Bacteroidota	Bacteroidia	Cytophagales	Hymenobacteraceae	Hymenobacter	Dominant microorganisms in a partial nitrification / Degrade complex organic compounds	Guo et al., 2020
	Cluster_2467	Proteobacteria	Alphaproteobacteria	Rhizobiales	Beijerinckiaceae	-	Essential players in plant function (N fixation) ; Biofilm formation	Dourado et al., 2015
	Cluster_933	Proteobacteria	Alphaproteobacteria	Rhizobiales	Beijerinckiaceae	-	Essential players in plant function (N fixation) ; Biofilm formation	Dourado et al., 2015
	Cluster_4699	Bacteroidota	Bacteroidia	Chitinophagales	Chitinophagaceae	Ferruginibacter	Hydrolyzing organic matter	Lim et al., 2009
	Cluster_1300	Armatimonadota	Fimbrimonadia	Fimbrimonadales	Fimbrimonadaceae	-	Involved in ANAMOX process	Silveira et al., 2021
	Cluster_1015	Deinococcota	Deinococci	Deinococcales	Deinococcaceae	Deinococcus	Metal reduction / production of antimicrobial particles	Chen et al., 2017
	Cluster_1860	Deinococcota	Deinococci	Deinococcales	Deinococcaceae	Deinococcus	Metal reduction / production of antimicrobial particles	Chen et al., 2017
	Cluster_3053	Actinobacteriota	Actinobacteria	Frankiales	-	-	N fixation	Barka et al., 2016
	Cluster_19679	Proteobacteria	Alphaproteobacteria	Caulobacterales	Caulobacteraceae	Brevundimonas	Nitrogen fixation	Kumar & Gera., 2014
	Cluster_2287	Abditibacteriota	Abditibacteria	Abditibacterales	Abditibacterium	-	Optimized for survival in low-nutrient habitat ; Extreme resistance against toxic compounds	Tahon et al., 2018
	Cluster_1205	Proteobacteria	Gammmaproteobacteria	Burkholderiales	Comamonadaceae	-	Potential denitrification pathway-†	Khan et al., 2002
	Cluster_3232	Proteobacteria	Gammmaproteobacteria	Burkholderiales	Comamonadaceae	-	Potential denitrification pathway-†	Khan et al., 2002
	Cluster_3032	Proteobacteria	Gammmaproteobacteria	Burkholderiales	Comamonadaceae	-	Potential denitrification pathway-†	Xu et al., 2022
	Cluster_2729	Proteobacteria	Gammmaproteobacteria	Xanthomonadales	Xanthomonadaceae	Luteimonas	Production of N2O ; Degradation of OM (production of amylase, cellulose and chitinase)	Finkmann et al., 2000 ; Zhang et al., 2015
	Cluster_5142	Actinobacteriota	Actinobacteria	Corynebacteriales	Nocardiaceae	Rhodococcus	Recycling organic matter	Belli et al., 1998
	Cluster_2370	Proteobacteria	Gammmaproteobacteria	Burkholderiales	Comamonadaceae	Limnohabitans	Substrate uptakes and growth	Kasalick et al., 2013
	Cluster_1297	Bacteroidota	Kapabacteria	Kapabacteriales	-	-	Sulfite reduction	Kadnikov et al., 2020
	Cluster_1939	Proteobacteria	Gammmaproteobacteria	Burkholderiales	Comamonadaceae	Ramlibacter	Uptake / Storage : PO43- ; C ; NH3+	Props et al., 2019 ; Zuo et al., 2020
	Cluster_1221	Planctomycetota	Planctomycetes	Gemmatales	Gemmataceae	Gemmata	Using Carbohydrate for C and energy sources	Fuerst and butler., 2022
	Cluster_1969	Proteobacteria	Gammmaproteobacteria	Salinisphaerales	Solimonadaceae	-	Ability to decompose chemical pollutants	Zhou et al., 2014
	Cluster_3174	Proteobacteria	Gammmaproteobacteria	Steroidobacterales	Steroidobacteraceae	-	-	-
	Cluster_2941	Acidobacteriota	Vicinamibacteria	Vicinamibacterales	Vicinamibacteraceae	-	-	-
D E C L I N I N G P H A S E (1 0 - 1 2)	Cluster_2469	Latescibacterota	unknown class	-	-	-	-	-
	Cluster_2703	Firmicutes	Clostridia	-	-	-	-	-
	Cluster_774	Proteobacteria	Gammmaproteobacteria	-	-	-	-	-
	Cluster_2788	Chloroflexi	Anaerolineae	-	-	-	-	-
	Cluster_2201	Actinobacteriota	Thermoleophilii	Gaiellales	-	-	-	-
	Cluster_5328	Firmicutes	Bacilli	Lactobacillales	Aerococcaceae	Aerococcus	-	-
	Cluster_1696	Bacteroidota	Bacteroidia	Chitinophagales	Chitinophagaceae	-	-	-
	Cluster_15993	Bacteroidota	Bacteroidia	Chitinophagales	Chitinophagaceae	Segetibacter	-	-
	Cluster_2277	Bacteroidota	Bacteroidia	Chitinophagales	Chitinophagaceae	Edaphobaculum	-	-
	Cluster_2364	Proteobacteria	Gammmaproteobacteria	Burkholderiales	Comamonadaceae	Caenimonas	-	-
	Cluster_2235	Proteobacteria	Gammmaproteobacteria	Burkholderiales	Comamonadaceae	Xenophilus	-	-
	Cluster_1225	Actinobacteriota	Actinobacteria	Corynebacteriales	Dietziaceae	Dietzia	-	-
	Cluster_2095	Planctomycetota	Planctomycetes	Gemmatales	Gemmataceae	-	-	-
	Cluster_967	Planctomycetota	Planctomycetes	Gemmatales	Gemmataceae	-	-	-
	Cluster_1561	Planctomycetota	Planctomycetes	Pirellulales	Pirellulaceae	-	-	-
	Cluster_3233	Bacteroidota	Bacteroidia	Chitinophagales	Saprosiraceae	-	-	-
	Cluster_3231	Bacteroidota	Bacteroidia	Chitinophagales	Saprosiraceae	-	-	-
	Cluster_1902	Bacteroidota	Bacteroidia	Chitinophagales	Saprosiraceae	-	-	-
	Cluster_1499	Bacteroidota	Bacteroidia	Sphingobacterales	Sphingobacteriaceae	Sphingobacterium	-	-
	Cluster_5390	Bacteroidota	Bacteroidia	Sphingobacterales	Sphingobacteriaceae	Sphingobacterium	-	-
	Cluster_4439	Bacteroidota	Bacteroidia	Sphingobacterales	Sphingobacteriaceae	Sphingobacterium	-	-
	Cluster_4755	Bacteroidota	Bacteroidia	Cytophagales	Spirosomaceae	Pseudarcicella	-	-
	Cluster_1218	Bacteroidota	Bacteroidia	Cytophagales	Spirosomaceae	Pseudarcicella	-	-
	Cluster_3059	Proteobacteria	Gammmaproteobacteria	Xanthomonadales	Xanthomonadaceae	Silanimonas	-	-
	Cluster_4813	Bacteroidota	Bacteroidia	Flavobacterales	Flavobacteriaceae	Flavobacterium	Algicidal properties against cyanobacteria	Meyer et al., 2017
	Cluster_2688	Bacteroidota	Bacteroidia	Flavobacterales	Flavobacteriaceae	Flavobacterium	Algicidal properties against cyanobacteria	Meyer et al., 2017
	Cluster_3076	Planctomycetota	Phycisphaerae	Phycisphaerales	Phycisphaeraceae	-	Chemoautotrophic	Qu et al., 2022
	Cluster_1396	Planctomycetota	Planctomycetes	Gemmatales	Gemmataceae	Fimbriglobus	Chitinolytic activities	Ravin et al., 2018
	Cluster_1640	Actinobacteriota	Actinobacteria	Pseudonocardiales	Pseudonocardiaceae	Pseudonocardia	Degrade N-containing aromatic components ; Anti-bacterial and fungal activities	Riahi et al., 2020
	Cluster_884	Proteobacteria	Alphaproteobacteria	Rhodobacterales	Rhodobacteraceae	Paracoccus	Denitrification ; Biofilm formation	Kumar & Spiro, 2017
	Cluster_1653	Proteobacteria	Gammmaproteobacteria	Burkholderiales	Oxalobacteraceae	Massilia	Dissolve Phosphate ; Implicate in N and iron cycles in soil	Zheng et al., 2017 ; Peng et al., 2019
	Cluster_1194	Bacteroidota	Bacteroidia	Cytophagales	Hymenobacteraceae	Hymenobacter	Dominant microorganisms in a partial nitrification / Degrade complex organic compounds	Guo et al., 2020
	Cluster_2007	Bacteroidota	Bacteroidia	Cytophagales	Hymenobacteraceae	Hymenobacter	Dominant microorganisms in a partial nitrification / Degrade complex organic compounds	Guo et al., 2020
	Cluster_1107	Bacteroidota	Bacteroidia	Cytophagales	Spirosomaceae	Emticicia	Enhance growth of certain microalgae	Tojama et al., 2019
	Cluster_4887	Proteobacteria	Alphaproteobacteria	Rhizobiales	Beijerinckiaceae	Methylobacterium-Methylorubrum	Essential players in plant function (N fixation) ; Biofilm formation	Dourado et al., 2015
	Cluster_26003	Proteobacteria	Alphaproteobacteria	Rhizobiales	Beijerinckiaceae	Methylobacterium-Methylorubrum	Essential players in plant function (N fixation) ; Biofilm formation	Dourado et al., 2015
	Cluster_328	Proteobacteria	Alphaproteobacteria	Rhizobiales	Beijerinckiaceae	Methylobacterium-Methylorubrum	Essential players in plant function (N fixation) ; Biofilm formation	Dourado et al., 2015
	Cluster_447	Proteobacteria	Alphaproteobacteria	Rhizobiales	Beijerinckiaceae	Methylobacterium-Methylorubrum	Essential players in plant function (N fixation) ; Biofilm formation	Dourado et al., 2015
	Cluster_4509	Proteobacteria	Alphaproteobacteria	Rhizobiales	Beijerinckiaceae	Methylobacterium-Methylorubrum	Essential players in plant function (N fixation) ; Biofilm formation	Dourado et al., 2015
	Cluster_763	Proteobacteria	Alphaproteobacteria	Rhizobiales	Beijerinckiaceae	Methylobacterium-Methylorubrum	Essential players in plant function (N fixation) ; Biofilm formation	Dourado et al., 2015
	Cluster_935	Proteobacteria	Alphaproteobacteria	Rhizobiales	Beijerinckiaceae	Methylobacterium-Methylorubrum	Essential players in plant function (N fixation) ; Biofilm formation	Dourado et al., 2015
	Cluster_13216	Proteobacteria	Alphaproteobacteria	Rhodospirillales	Magnetospirillaceae	Magnetospirillum	Fix N	Ji et al., 2013
	Cluster_1439	Deinococcota	Deinococci	Deinococcales	Deinococcaceae	Deinococcus	Metal reduction / production of antimicrobial particles	Chen et al., 2017
	Cluster_3595	Deinococcota	Deinococci	Deinococcales	Deinococcaceae	Deinococcus	Metal reduction / production of antimicrobial particles	Chen et al., 2017
	Cluster_2902	Proteobacteria	Gammmaproteobacteria	Methylococcales	Methylomonadaceae	-	Methane oxydation	Bowman, 2014 ; Taubert et al., 2019
	Cluster_2853	Proteobacteria	Gammmaproteobacteria	Burkholderiales	Comamonadaceae	Rhododerax	Photosynthetic heterotroph, key organism in high turbidity environments	Zhang et al., 2022
	Cluster_1296	Proteobacteria	Alphaproteobacteria	Acetobacterales	Acetobacteraceae	Roseomonas	Potential bio-indicator of Cyanobacteria blooms	Gu et al., 2022
	Cluster_24775	Proteobacteria	Alphaproteobacteria	Acetobacterales	Acetobacteraceae	Roseomonas	Potential bio-indicator of Cyanobacteria blooms	Gu et al., 2022
	Cluster_4698	Proteobacteria	Alphaproteobacteria	Acetobacterales	Acetobacteraceae	Roseomonas	Potential bio-indicator of Cyanobacteria blooms	Gu et al., 2022
	Cluster_1240	Proteobacteria	Gammmaproteobacteria	Burkholderiales	Comamonadaceae	-	Potential denitrification pathway-†	Khan et al., 2002
	Cluster_1153	Proteobacteria	Gammmaproteobacteria	Burkholderiales	Comamonadaceae	-	Potential denitrification pathway-†	Khan et al., 2002
	Cluster_1319	Proteobacteria	Gammmaproteobacteria	Burkholderiales	Comamonadaceae	-	Potential denitrification pathway-†	Khan et al., 2002
	Cluster_3305	Proteobacteria	Gammmaproteobacteria	Burkholderiales	Comamonadaceae	-	Potential denitrification pathway-†	Khan et al., 2002
	Cluster_3165	Proteobacteria	Gammmaproteobacteria	Burkholderiales	Comamonadaceae	-	Potential denitrification pathway-†	Khan et al., 2002
	Cluster_4412	Myxococota	Polyangia	Nannocystales	Nannocystaceae	Nannocystis	Production of biofloculant-†	Zhang et al., 2002
	Cluster_1031	Fusobacteriota	Fusobacteriia	Fusobacteriales	Fusobacteriaceae	Cetobacterium	Promote the decomposition of organic matter-†	Borsodi et al., 2017
	Cluster_4330	Chloroflexi	Anaerolineae	Anaerolineales	Anaerolineaceae	-	Sugar fermentation / Degradation of refractories compounds	Arzman et al., 2017
	Cluster_1933	Desulfobacterota						

Cluster 1025	Desulfobacterota	Desulfurimonadial	-	-	-	-	-	-
Cluster 2044	Myxococcota	Polyangia	-	-	-	-	-	-
Cluster 4530	8deIlowbrionota	Oligoflexia	-	-	-	-	-	-
Cluster 3503	Myxococcota	Polyangia	-	-	-	-	-	-
Cluster 491	Candidate WPS-2	unknown class	-	-	-	-	-	-
Cluster 501	Planctomycetota	Phycisphaerae	Phycisphaerales	-	-	-	-	-
Cluster 4650	Bacteroidota	Bacteroidia	Sphingobacteriales	-	-	-	-	-
Cluster 3054	Bacteroidota	Bacteroidia	Sphingobacteriales	-	-	-	-	-
Cluster 6951	Bacteroidota	Bacteroidia	Sphingobacteriales	-	-	-	-	-
Cluster 5032	Desulfobacterota	Syntrophia	Syntrophales	-	-	-	-	-
Cluster 2025	Proteobacteria	Alphaproteobacteria	Acetobacterales	Acetobacteraceae	-	-	-	-
Cluster 3355	Bacteroidota	Bacteroidia	Chitinophagales	Chitinophagaceae	Parasediminibacterium	-	-	-
Cluster 3100	Planctomycetota	Planctomycetes	Gemmatales	Gemmataceae	-	-	-	-
Cluster 2012	Proteobacteria	Gammaproteobacteria	Pseudomonadales	Moraxellaceae	-	-	-	-
Cluster 1316	Proteobacteria	Gammaproteobacteria	Pseudomonadales	Moraxellaceae	-	-	-	-
Cluster 4007	Proteobacteria	Gammaproteobacteria	Burkholderiales	Oxalobacteraceae	Agitococcus	-	-	-
Cluster 4123	Bacteroidota	Bacteroidia	Chitinophagales	Saprospiraceae	Candidatus Aqirestis	-	-	-
Cluster 2634	Bacteroidota	Bacteroidia	Chitinophagales	Saprospiraceae	Candidatus Aqirestis	-	-	-
Cluster 4258	Bacteroidota	Bacteroidia	Chitinophagales	Saprospiraceae	Candidatus Aqirestis	-	-	-
Cluster 3429	Bacteroidota	Bacteroidia	Cytophagales	Spirosomaceae	Arcicella	Accumulate P	-	Cakmak et al., 2022
Cluster 892	Bacteroidota	Bacteroidia	Cytophagales	Spirosomaceae	Arcicella	Accumulate P	-	Cakmak et al., 2022
Cluster 1238	Bacteroidota	Bacteroidia	Cytophagales	Spirosomaceae	Arcicella	Accumulate P	-	Cakmak et al., 2022
Cluster 3888	Actinobacteriota	Actinobacteria	Propionibacteriales	Propionibacteriaceae	Microclunatus	Accumulation and release of P	-	Nakamura et al., 1995
Cluster 528	Bacteroidota	Bacteroidia	Flavobacteriales	Flavobacteriaceae	Flavobacterium	Algicidal properties against cyanobacteria	-	Meyer et al., 2017
Cluster 3523	Bacteroidota	Bacteroidia	Flavobacteriales	Flavobacteriaceae	Flavobacterium	Algicidal properties against cyanobacteria	-	Meyer et al., 2017
Cluster 7955	Bacteroidota	Bacteroidia	Flavobacteriales	Flavobacteriaceae	Flavobacterium	Algicidal properties against cyanobacteria	-	Meyer et al., 2017
Cluster 2657	Bacteroidota	Bacteroidia	Flavobacteriales	Flavobacteriaceae	Flavobacterium	Algicidal properties against cyanobacteria	-	Meyer et al., 2017
Cluster 3461	Bacteroidota	Bacteroidia	Flavobacteriales	Flavobacteriaceae	Flavobacterium	Algicidal properties against cyanobacteria	-	Meyer et al., 2017
Cluster 4438	Bacteroidota	Bacteroidia	Flavobacteriales	Flavobacteriaceae	Flavobacterium	Algicidal properties against cyanobacteria	-	Meyer et al., 2017
Cluster 1572	Bacteroidota	Bacteroidia	Flavobacteriales	Flavobacteriaceae	Flavobacterium	Algicidal properties against cyanobacteria	-	Meyer et al., 2017
Cluster 18901	Bacteroidota	Bacteroidia	Flavobacteriales	Flavobacteriaceae	Flavobacterium	Algicidal properties against cyanobacteria	-	Meyer et al., 2017
Cluster 2384	Bacteroidota	Bacteroidia	Flavobacteriales	Flavobacteriaceae	Flavobacterium	Algicidal properties against cyanobacteria	-	Meyer et al., 2017
Cluster 3115	Bacteroidota	Bacteroidia	Flavobacteriales	Flavobacteriaceae	Flavobacterium	Algicidal properties against cyanobacteria	-	Meyer et al., 2017
Cluster 6205	Bacteroidota	Bacteroidia	Flavobacteriales	Flavobacteriaceae	Flavobacterium	Algicidal properties against cyanobacteria	-	Meyer et al., 2017
Cluster 1658	Bacteroidota	Bacteroidia	Chitinophagales	Chitinophagaceae	Flavisolibacter	Associate to other bacteria in process of denitrification ; Breakdown organic C	-	Liu et al., 2014
Cluster 4801	Proteobacteria	Gammaproteobacteria	Pseudomonadales	Moraxellaceae	Acinetobacter	Biofilm formation	-	Irankhah et al., 2019
Cluster 5164	Proteobacteria	Gammaproteobacteria	Pseudomonadales	Moraxellaceae	Acinetobacter	Biofilm formation	-	Irankhah et al., 2019
Cluster 5150	Proteobacteria	Gammaproteobacteria	Pseudomonadales	Moraxellaceae	Acinetobacter	Biofilm formation	-	Irankhah et al., 2019
Cluster 3710	Proteobacteria	Gammaproteobacteria	Pseudomonadales	Moraxellaceae	Acinetobacter	Biofilm formation	-	Irankhah et al., 2019
Cluster 2394	Proteobacteria	Gammaproteobacteria	Pseudomonadales	Pseudomonadaceae	Pseudomonas	Biofilm formation	-	Auerbach et al., 2000
Cluster 4698	Proteobacteria	Gammaproteobacteria	Pseudomonadales	Pseudomonadaceae	Pseudomonas	Biofilm formation	-	Auerbach et al., 2000
Cluster 863	Bacteroidota	Bacteroidia	Cytophagales	Spirosomaceae	Flectobacillus	Biofilm formation	-	Furuhata et al., 2008
Cluster 3219	Bacteroidota	Bacteroidia	Cytophagales	Spirosomaceae	Flectobacillus	Biofilm formation	-	Furuhata et al., 2008
Cluster 3658	Bacteroidota	Bacteroidia	Chitinophagales	Saprospiraceae	Portibacter	Breaking down organic matter / Growing attached to surface	-	Papadatou et al., 2021
Cluster 2167	Chloroflexi	Chloroflexia	Kallitotinales	-	-	Cellulolytic activities	-	Cole et al., 2013
Cluster 361	Planctomycetota	Planctomycetes	Gemmatales	Gemmataceae	Fimbrigliobus	Chitinolytic activities	-	Ravin et al., 2018
Cluster 591	Planctomycetota	Planctomycetes	Gemmatales	Gemmataceae	Fimbrigliobus	Chitinolytic activities	-	Ravin et al., 2018
Cluster 674	Myxococcota	Polyangia	Phaselicystidaceae	Phaselicystis	-	Degradation of biopolymers	-	Jiang et al., 2020
Cluster 13026	Proteobacteria	Alphaproteobacteria	Sphingomonadales	Sphingomonadaceae	Sphingomonas	Degradation of Microcystin ; Biodegrade refractory organic compounds	-	Valeria et al., 2006 ; White et al., 1996
Cluster 649	Proteobacteria	Gammaproteobacteria	Burkholderiales	Comamonadaceae	Giesbergia	Degradation of nitrogen heterocyclic compounds and phenols	-	Shi et al., 2019
Cluster 5252	Planctomycetota	Planctomycetes	Isoosphaerales	Isoosphaeraceae	Tundrisphaera	Degradation of organic matter	-	Perez-mon et al., 2022
Cluster 2281	Proteobacteria	Gammaproteobacteria	Burkholderiales	Aquaspirillaceae	Aquaspirillum	Denitrification	-	Bazilinski et Blakemore., 1983
Cluster 14301	Proteobacteria	Gammaproteobacteria	Burkholderiales	Comamonadaceae	Comamonas	Denitrification and ammonification	-	Wu et al., 2018
Cluster 1869	Proteobacteria	Gammaproteobacteria	Burkholderiales	Oxalobacteraceae	Massilia	Dissolve Phosphate ; Implicate in N and iron cycles in soil	-	Zheng et al., 2017 ; Peng et al., 2019
Cluster 1049	Proteobacteria	Gammaproteobacteria	Burkholderiales	Oxalobacteraceae	Massilia	Dissolve Phosphate ; Implicate in N and iron cycles in soil	-	Zheng et al., 2017 ; Peng et al., 2019
Cluster 3292	Proteobacteria	Gammaproteobacteria	Burkholderiales	Oxalobacteraceae	Massilia	Dissolve Phosphate ; Implicate in N and iron cycles in soil	-	Zheng et al., 2017 ; Peng et al., 2019
Cluster 1952	Bacteroidota	Bacteroidia	Cytophagales	Hymenobacteraceae	Hymenobacter	Dominant microorganisms in a partial nitrification biofilm / Degrade complex organic compounds	-	Guo et al., 2020
Cluster 5117	Bacteroidota	Bacteroidia	Cytophagales	Hymenobacteraceae	Hymenobacter	Dominant microorganisms in a partial nitrification biofilm / Degrade complex organic compounds	-	Guo et al., 2020
Cluster 1484	Proteobacteria	Alphaproteobacteria	Rhizobiales	Beijerinckaceae	Methylobacterium-Methyloburum	Essential players in plant function (N fixation) ; Biofilm formation	-	Dourado et al., 2015
Cluster 4382	Proteobacteria	Alphaproteobacteria	Rhizobiales	Beijerinckaceae	Methylobacterium-Methyloburum	Essential players in plant function (N fixation) ; Biofilm formation	-	Dourado et al., 2015
Cluster 2067	Proteobacteria	Alphaproteobacteria	Rhizobiales	Beijerinckaceae	Methylobacterium-Methyloburum	Essential players in plant function (N fixation) ; Biofilm formation	-	Dourado et al., 2015
Cluster 2556	Proteobacteria	Alphaproteobacteria	Rhizobiales	Beijerinckaceae	Methylobacterium-Methyloburum	Essential players in plant function (N fixation) ; Biofilm formation	-	Dourado et al., 2015
Cluster 4239	Proteobacteria	Alphaproteobacteria	Azospirillales	Azospirillaceae	Azospirillum	Favoring N fixation	-	Bashan et al., 2004
Cluster 5038	Proteobacteria	Alphaproteobacteria	Rhodospirillales	Magnetospirillaceae	Magnetospira	Fix N	-	Ji et al., 2013
Cluster 26116	Proteobacteria	Gammaproteobacteria	Burkholderiales	Comamonadaceae	Candidatus Symbiobacter	Involved in prokariotic symbiosis	-	Liu et al., 2013
Cluster 1789	Proteobacteria	Gammaproteobacteria	Methyloccoccales	Methylocomonadaceae	-	Methane oxydation	-	Bowman, 2014 ; Taubert et al., 2019
Cluster 33116	Proteobacteria	Gammaproteobacteria	Burkholderiales	Hydrogenophilaceae	Spirillum	N2 fixation	-	Day and Dvöbereiner., 1976
Cluster 4394	Proteobacteria	Alphaproteobacteria	Caulobacteriales	Caulobacteraceae	Brevundimonas	Nitrogen fixation	-	Kumar & Gera., 2014
Cluster 2519	Proteobacteria	Gammaproteobacteria	Burkholderiales	Oxalobacteraceae	Umbibacterium	NO3- reduction ; Cellulolytic bacterium	-	Kim et al., 2014 ; Nahm et al., 2017
Cluster 1554	Proteobacteria	Gammaproteobacteria	Burkholderiales	Oxalobacteraceae	Umbibacterium	NO3- reduction ; Cellulolytic bacterium	-	Kim et al., 2014 ; Nahm et al., 2017
Cluster 5126	Proteobacteria	Gammaproteobacteria	Burkholderiales	Oxalobacteraceae	Umbibacterium	NO3- reduction ; Cellulolytic bacterium	-	Kim et al., 2014 ; Nahm et al., 2017
Cluster 1329	Proteobacteria	Gammaproteobacteria	Burkholderiales	Oxalobacteraceae	Umbibacterium	NO3- reduction ; Cellulolytic bacterium	-	Kim et al., 2014 ; Nahm et al., 2017
Cluster 4398	Proteobacteria	Gammaproteobacteria	Burkholderiales	Oxalobacteraceae	Umbibacterium	NO3- reduction ; Cellulolytic bacterium	-	Kim et al., 2014 ; Nahm et al., 2017
Cluster 2078	Proteobacteria	Alphaproteobacteria	Holospirales	Holospiraceae	-	Obligatory associated with eukaryotes	-	Castelli et al., 2021
Cluster 3325	Bacteroidota	Bacteroidia	Cytophagales	Spirosomaceae	Dyadobacter	Production of polysaccharide ; Key to algae fitness	-	Astafyeva et al., 2022
Cluster 20748	Actinobacteriota	Actinobacteria	Corynebacteriales	Noctardiaceae	Rhodococcus	Recycling organic matter	-	Bell et al., 1998
Cluster 2292	Planctomycetota	Planctomycetes	Gemmatales	Gemmataceae	Gemmata	Using Carbohydrate for C and energy sources	-	Fuerst and butler., 2022
Cluster 1749	Planctomycetota	Planctomycetes	Gemmatales	Gemmataceae	Gemmata	Using Carbohydrate for C and energy sources	-	Fuerst and butler., 2022
Cluster 4720	Proteobacteria	Alphaproteobacteria	Rhizobiales	Rhizobiaceae	Allorhizobium-Neorhizobium-Pararhizobium-Rhizobium	Promote N absorption	-	Syromatnikov et al., 2022
Cluster 5846	Proteobacteria	Alphaproteobacteria	Rhizobiales	Rhizobiales Incertae Sedis	Bauldia	Biomarker of poor N and P environment	-	Wongkiew t. et al., 2022
Cluster 2078	Proteobacteria	Alphaproteobacteria	Rhodobacterales	Rhodobacteraceae	Amaricoccus	Nitrification / denitrification-†	-	Wang et al., 2020
Cluster 23740	Planctomycetota	Planctomycetes	Planctomycetales	Schlesneriaceae	Planctopirius	Enhance formation of biofilm-†	-	Kruppa and Czermak., 2022
Cluster 1851	Proteobacteria	Alphaproteobacteria	Sphingomonadales	Sphingomonadaceae	Rhizorhapis	May have bioremediation abilities	-	Siles et al., 2022
Cluster 2431	Firmicutes	Negativicutes	Veillonellales-Selenomonadales	Sporosusaceae	Pelosisinus	Metal reduction-†	-	Biundo et al., 2016
Cluster 3546	Actinobacteriota	Actinobacteria	Streptomycetales	Streptomycetaceae	-	Antimicrobial activities-†	-	kamper et al., 2014
Cluster 31644	Proteobacteria	Alphaproteobacteria	Zavarziniales	Zavarzinaceae	-	-	-	-