

Supplementary Table 4: Accessions, databases and types of environment for all *A. lacustris* related sequences that were incorporated in Figure 6 and Supplementary Figure 6

Sequence / OTU	OTU size	Database	Accession (no. of reads)	Environment
freshwater OTU 1	2	VAMPS	RARE_NFF_Bv6v4 (1), RARE_MSF_Bv6v4 (1)	Fresh water distribution system
freshwater OTU 2	26	VAMPS	RARE_NFF_Bv6v4 (18), RARE_MSF_Bv6v4 (6), RARE_WHF_Bv6v4 (2)	Fresh water distribution system
freshwater OTU 3	3	VAMPS	RARE_NFF_Bv6v4	Fresh water distribution system
freshwater OTU 4	11	SRA	SRR305966 (6), SRR305967 (5)	Lakes and streams near the Toolik Research Station
freshwater OTU 5	1	SRA	SRR305966	Lakes and streams near the Toolik Research Station
freshwater OTU 6	4	SRA	SRR305966 (3), SRR305967 (1)	Lakes and streams near the Toolik Research Station
freshwater OTU 7	3	SRA	SRR305966 (2), SRR305967 (1)	Lakes and streams near the Toolik Research Station
freshwater OTU 8	2	SRA	SRR305966 (1), SRR305967 (1)	Lakes and streams near the Toolik Research Station
freshwater OTU 9	12	SRA	ERR204530 (4), ERR204548 (1), ERR204613 (1), ERR204649 (1), ERR204651 (1), ERR204690 (1), ERR204702 (2), ERR204743 (1)	Fresh fruits and vegetables surfaces
freshwater OTU 10	1	SRA	ERR204555	Fresh fruits and vegetables surfaces
UB ¹ clone ELB16-030	-	NCBI-NT	DQ015802.1	lake water, East Lobe at 16 m
UB ¹ clone H06CH12_11_17	-	NCBI-NT	HF558600.1	mine tailing material
UB ¹ clone lp227	-	NCBI-NT	KC332495.1	apple orchard
UB ¹ clone 69-34	-	NCBI-NT	DQ833504.1	sediment of Guanting Reservoir
USB ² clone bac2nit3	-	NCBI-NT	EU861930.1	nitrogen amended dry meadow surface soil
UAB ³ clone 5_28_E12_b	-	NCBI-NT	JQ086827.1	push core sediment sample from the vadose zone of a hydrocarbon contaminated aquifer
UB ¹ clone 300I E11	-	NCBI-NT	AY662020.1	groundwater contaminated with high levels of nitric acid-bearing uranium waste

¹ UB = Uncultured bacterium

² USB = Uncultured soil bacterium

³ UAB = Uncultured alphaproteobacterium