

Table S3. PICRUST-predicted cyanocobalamin synthesis gene abundance from wastewater microbial community

Gene ID ¹	KEGG orthology	Full gene name	<i>A. protothecoides</i> ⁴		
			Original MC ²	Adapted MC ³	Adapted MC + algae
cysG	K02302	uroporphyrin-III C-methyltransferase / precorrin-2 dehydrogenase / sirohydrochlorin ferrochelatase	1606 a ⁵	3218 a	3736 a
CobA	K02303	uroporphyrin-III C-methyltransferase	1056 a	1801 a	1687 a
HemX	K02496	uroporphyrin-III C-methyltransferase	221 b	717 a	238 b
CobA, HemD	K13542	uroporphyrinogen III methyltransferase / synthase	2095 a	645 b	522 b
HemDX	K13543	uroporphyrinogen III methyltransferase / synthase	15 b	41 a	24 b
MET8	K02304	precorrin-2 dehydrogenase / sirohydrochlorin ferrochelatase	2524 a	1350 ab	807 b
CbiK	K02190	sirohydrochlorin cobaltochelatase	1778 a	203 b	102 b
CbiX	K03795	sirohydrochlorin cobaltochelatase	331 b	756 a	546 ab
CbiL, CobI	K03394	precorrin-2 C20-methyltransferase / cobalt-factor-2 C20-methyltransferase; precorrin-2/cobalt-factor-2 C20-methyltransferase	2953 a	1297 b	1348 b
CbiH, CobJ	K05934	precorrin-3B C17-methyltransferase	1043 a	262 b	205 b
CbiGH, CobJ	K13541	cobalamin biosynthesis protein CbiG / precorrin-3B C17-methyltransferase; cobalt-precorrin 5A hydrolase / precorrin-3B C17-methyltransferase	266 a	262 a	448 a
CbiF, CobM	K05936	precorrin-4 C11-methyltransferase	1197 a	415 b	595 b
CbiG	K02189	cobalamin biosynthesis protein CbiG;cobalt-precorrin 5A hydrolase	1201 a	710 b	307 c
CbiD	K02188	cobalamin biosynthesis protein CbiD;cobalt-precorrin-5B (C1)-methyltransferase	1352 a	172 b	425 b
CbiJ, CobK	K05895	precorrin-6X reductase	791 a	340 b	539 ab
CbiT	K02191	precorrin-8W decarboxylase; cobalt-precorrin-7 (C15)-methyltransferase	492 a	9 b	2 b
CbiE	K03399	precorrin-6Y C5,15-methyltransferase	492 a	9 b	2 b
CbiC, CobH	K06042	precorrin-8X methylmutase	1205 a	403 b	599 b
CbiA, CobB	K02224	cobyrrinic acid a,c-diamide synthase; cobyrrinic acid a,c-diamide synthase	3712 a	2063 b	1717 b
CobG	K02229	precorrin-3B synthase	65 b	249 a	163 ab
CobF	K02228	precorrin-6A synthase	143 a	259 a	178 a
CobL	K00595	precorrin-6Y C5,15-methyltransferase / precorrin-8W decarboxylase	2007 a	1302 b	1394 b
CobN	K02230	cobaltochelatase CobN	417 a	698 a	727 a
CobS	K09882	cobaltochelatase CobS	674 a	1347 a	1230 a
CobT	K09883	cobaltochelatase CobT	497 a	981 a	1168 a
CobR	K13786	cob(II)yrinic acid a,c-diamide reductase	5 b	20 ab	52 a
MMAB, PduO	K00798	cob(I)alamin adenosyltransferase	2207 a	1811 ab	1094 b
CbiP, CobQ	K02232	adenosylcobyrrinic acid synthase	1871 a	1431 ab	910 b
CobC, CobC1	K02225	cobalamin biosynthetic protein CobC	171 b	257 b	524 a
CbiB, CobD	K02227	adenosylcobinamide-phosphate synthase; adenosylcobinamide-phosphate synthase CobD	1955 a	1368 b	810 c
CbiZ	K08260	adenosylcobinamide hydrolase	21 a	1 b	1 b
CobP, CobU	K02231	adenosylcobinamide kinase / adenosylcobinamide-phosphate guanylyltransferase	3572 a	2205 b	1653 b
CobD	K04720	threonine-phosphate decarboxylase	1150 a	118 b	16 b
CobU, CobT	K00768	nicotinate-nucleotide--dimethylbenzimidazole phosphoribosyltransferase	1909 a	1405 ab	968 b
CobC, PhPB	K02226	alpha-ribazole phosphatase	189 a	61 b	5 c
CobS, CobV	K02233	adenosylcobinamide-GDP ribazoletransferase	1959 a	1094 b	874 b
Total			43151 a	29281 ab	25617 b

¹Gene IDs are based on the KEGG orthology and match those shown in Figure S2²Original community refers to microorganisms present in the wastewater prior to cultivation in aerated bioreactors.³Adapted community refers to microorganisms present after 4-5 days of culture in aerated bioreactors without algae.⁴The algae strain was only added to one set of bioreactors but all bioreactors under this heading were part of the same batch.⁵Within an algae species, values with the same letter in the same row are not statistically different at the 0.05 level based on n=3 replicates