A strategy for rapid dechlorination of polychlorinated biphenyls (PCBs) by *Dehalococcoides mccartyi* strains

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Supporting Information

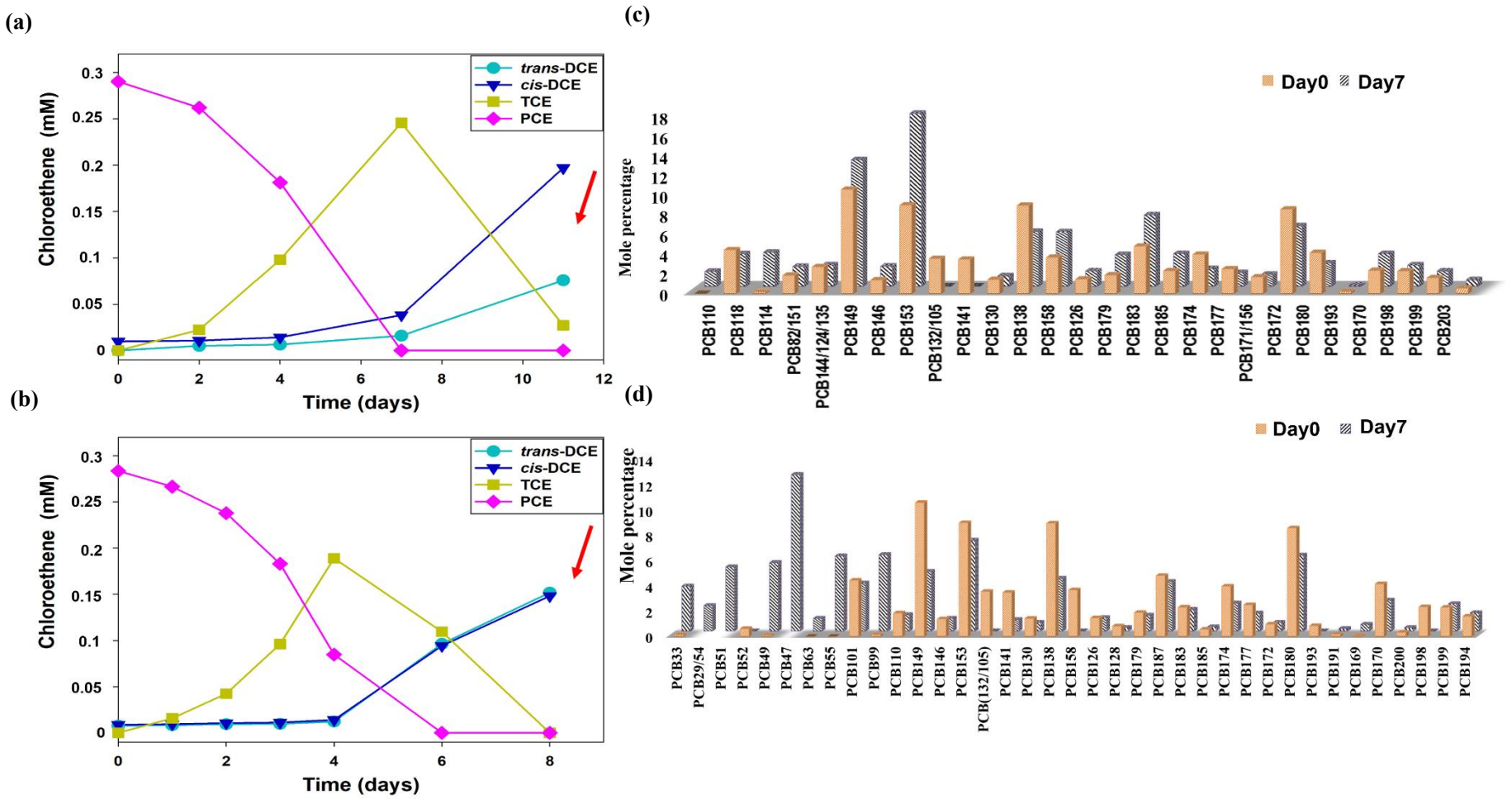

Figure S1 Chloroethene dechlorination profile of (a) CG1, and (b) CG5 culture pre-grown on 0.3 mM PCE; PCB dechlorination profile of (c) CG1, and (d) CG5 culture following pre-cultivation with 0.3 mM PCE (full arrow indicates amendment of Aroclor 1260)

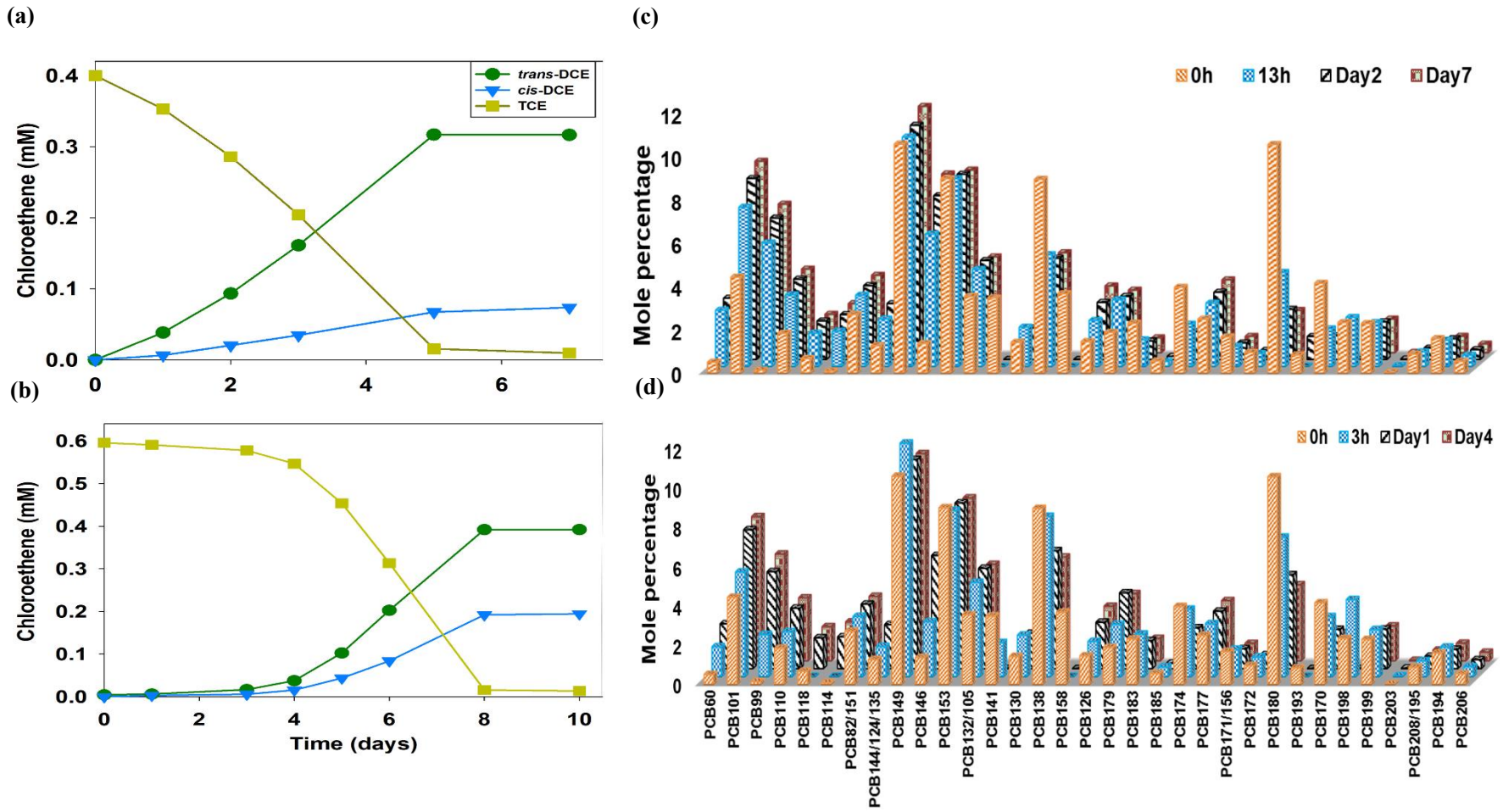

Figure S2 Chloroethene dechlorination profile of CG4 culture pre-grown on (a) 0.4 mM TCE, and (b) 0.6 mM TCE; PCB dechlorination profile of CG4 culture following pre-cultivation with (c) 0.4 mM TCE, and (d) 0.6 mM TCE

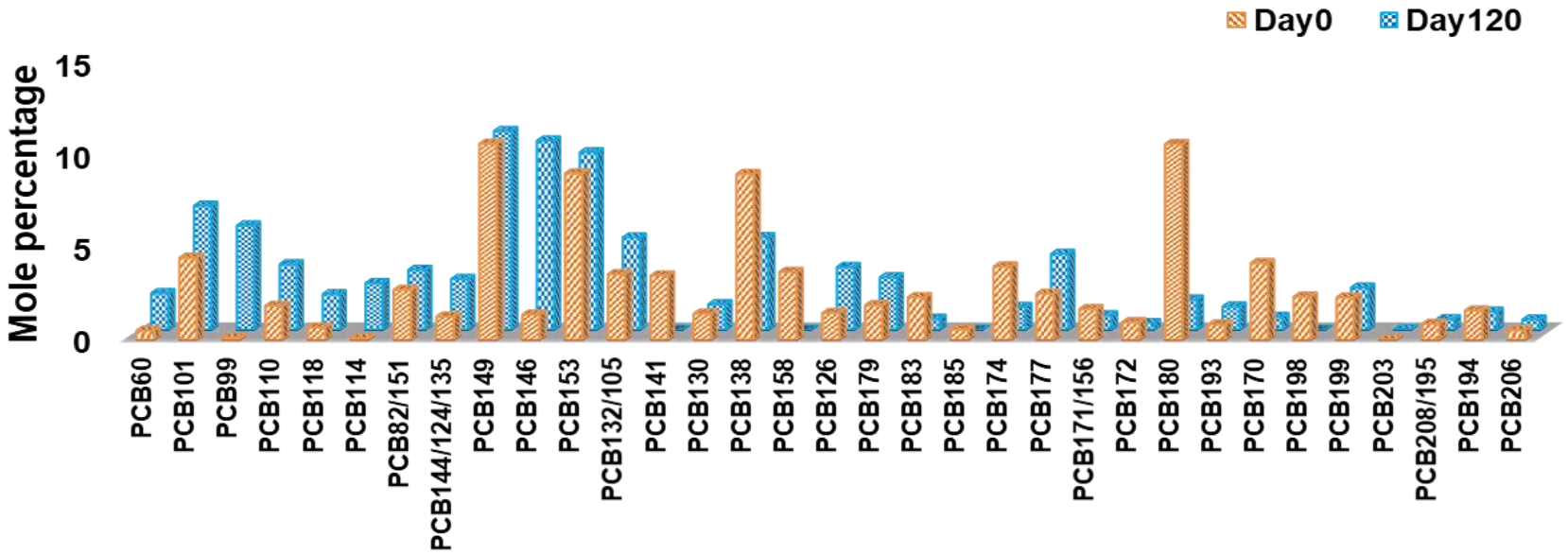

Figure S3 PCB dechlorination profile of CG4 culture when fed with Aroclor1260 as the sole electron acceptors

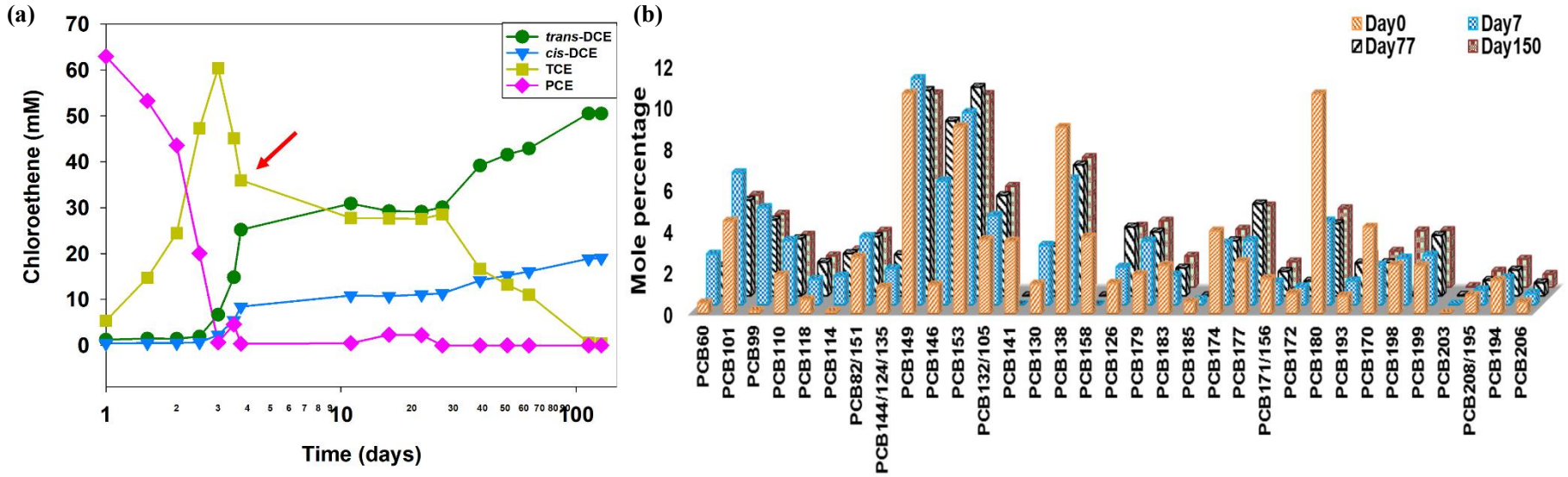

Figure S4 (a) Chloroethene dechlorination profile and (b) PCB dechlorination profile of CG4 following Aroclor 1260 amendment in the presence of 0.35 mM residual TCE (full arrow indicates amendment of Aroclor 1260)

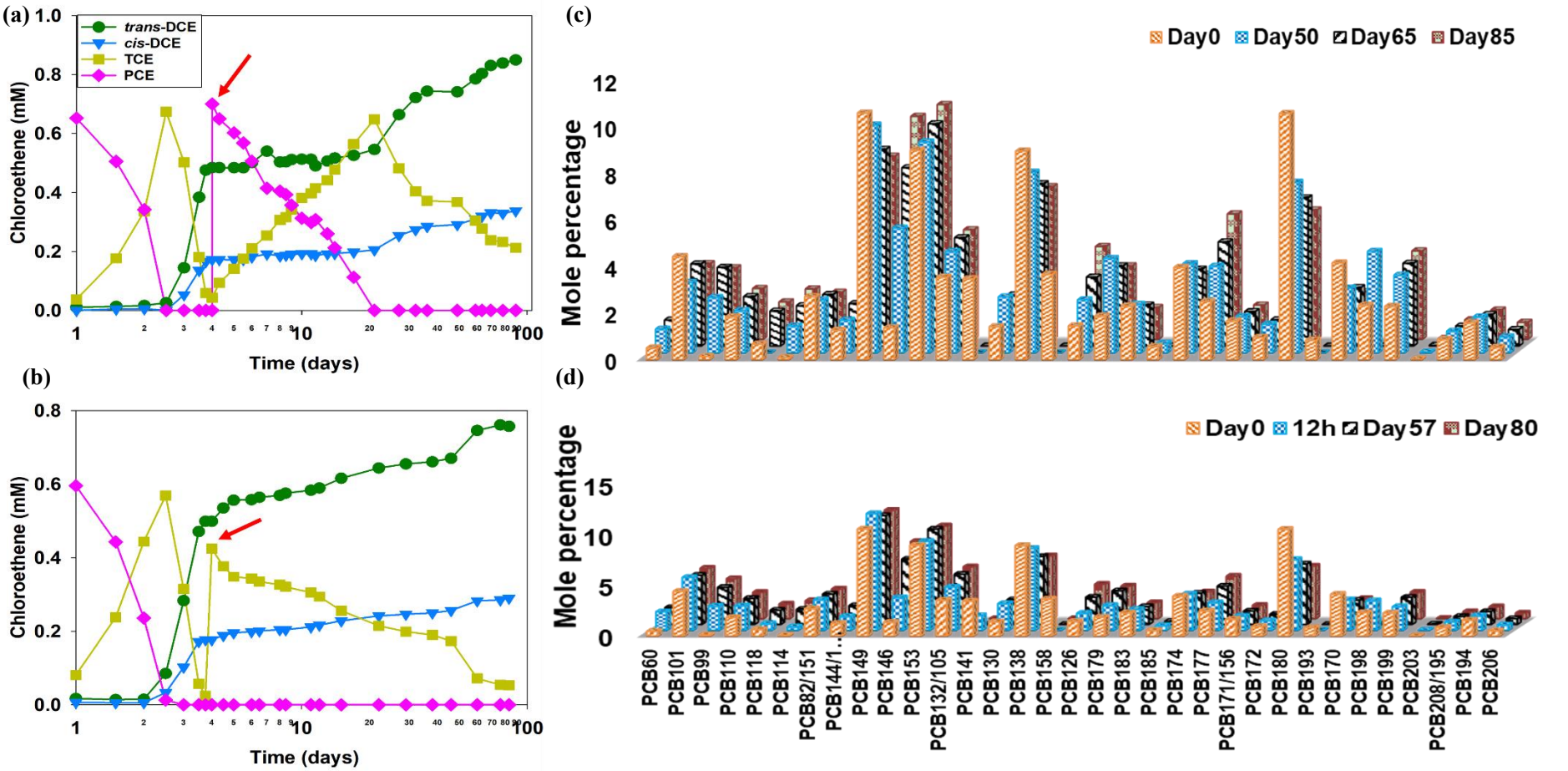

Figure S5 Chloroethene dechlorination profile of CG4 following co-amendment of (a) 0.7 mM PCE with Aroclor1260, and (b) 0.4 mM TCE with Aroclor1260; PCB dechlorination profile of CG4 following co-amendment of (c) 0.7 mM PCE with Aroclor1260, and (d) 0.4 mM TCE with Aroclor1260 (full arrow indicates co-amendment of chloroethenes and Aroclor 1260)

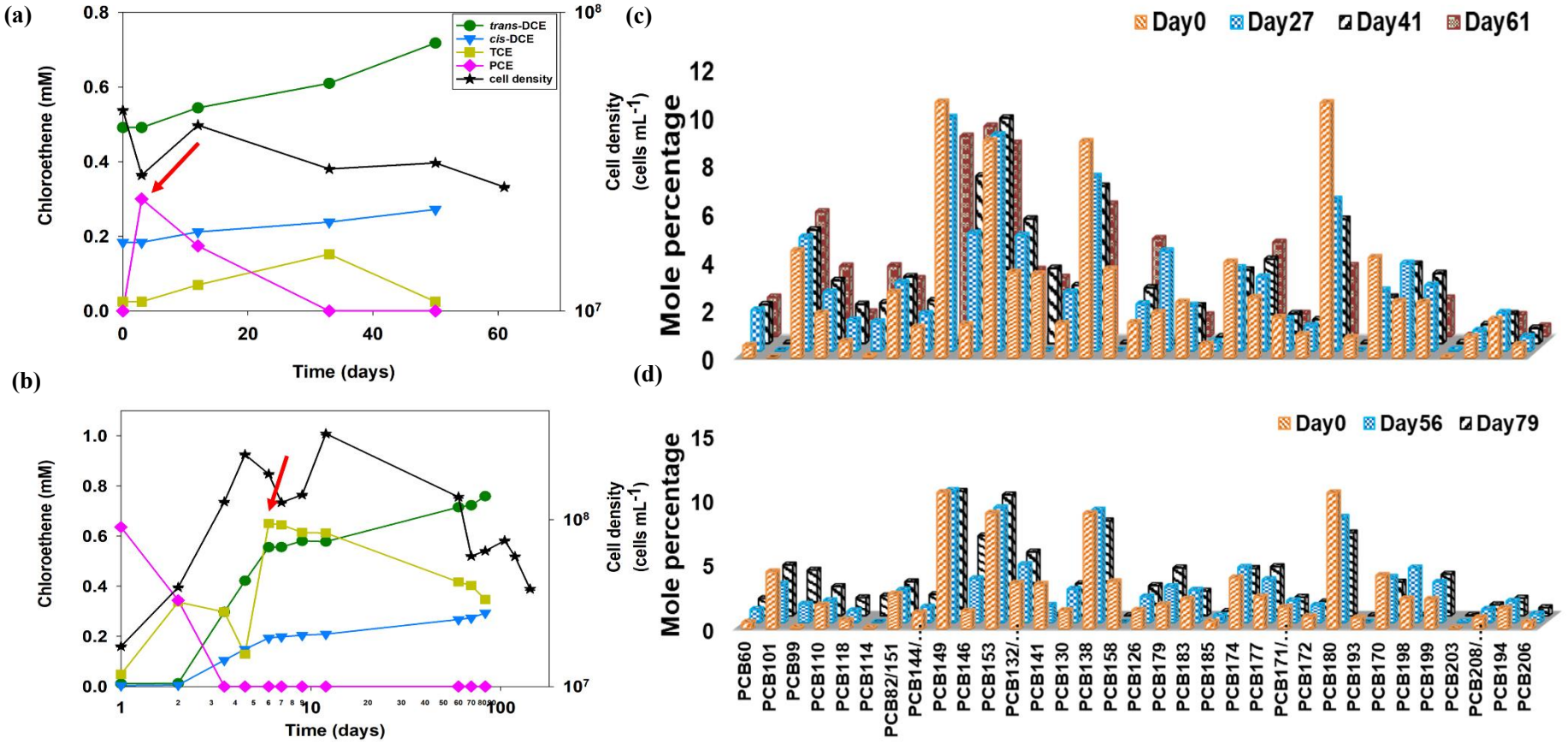

Figure S6 Chloroethene dechlorination profile and cell density of CG4 culture following co-amendment of (a) 0.3 mM PCE with Aroclor1260, and (b) 0.7 mM TCE with Aroclor1260; PCB dechlorination profile of CG4 culture following co-amendment of (c) 0.3 mM PCE with Aroclor1260, and (d) 0.7 mM TCE with Aroclor1260 (full arrow indicates co-amendment of chloroethenes and Aroclor 1260)

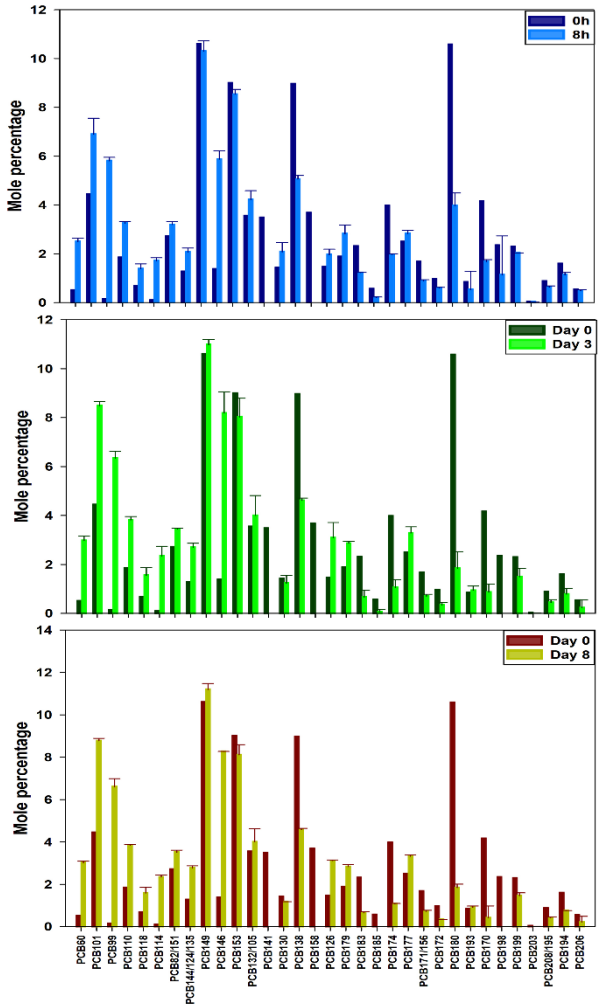

Figure S7 Replicate data of PCB dechlorination profile of CG4 culture pre-grown on 0.3 mM PCE

Table S1 Comparison of chlorine removal rate among different treatments

Experiment setup		Substrates	Chlorine Removal Rate of PCBs ($\mu M \cdot day^{-1}$)	PCB dechlorination rate ($nmol \cdot cell^{-1} \cdot day^{-1}$)	Reaction Time
Control Set		Aroclor1260 only	0.24	3.53×10^{-8}	120 days
Pre-cultivation assay	**PCE or TCE enhance PCBs dechlorination**	(0.4 mM) TCE→DCEs + Aroclor1260	12.68	1.92×10^{-7}	71 h
		(0.6 mM) TCE→DCEs + Aroclor1260	11.69	1.13×10^{-7}	96 h
		(0.7 mM) TCE→DCEs + Aroclor1260	17.10	7.77×10^{-8}	71 h
		(0.3 mM) PCE→DCEs + Aroclor1260	15.39	1.11×10^{-6}	72 h
		(0.7 mM) PCE→DCEs + Aroclor1260	15.83	7.08×10^{-8}	70 h
		(0.4 mM) TCE & (0.7 mM) PCE→DCEs + Aroclor1260	13.14	1.19×10^{-7}	62 h
		(0.7 mM) PCE & (0.7 mM) PCE→DCEs + Aroclor1260	15.71	1.12×10^{-7}	50 h
Co-amendment assay	**Stimulatory effect of PCE**	PCE (0 mM) & Aroclor1260	15.72	6.04×10^{-7}	72 h
	Inhibitory effect of PCE	PCE (0.1 mM) & Aroclor1260	0.71	2.75×10^{-8}	33 days
		PCE (0.2 mM) & Aroclor1260	0.32	1.22×10^{-8}	33 days
		PCE (0.3 mM) & Aroclor1260	0.58	2.21×10^{-8}	61 days
		PCE (0.7 mM) & Aroclor1260	0.03	1.23×10^{-9}	88 days
	Stimulatory effect of TCE	TCE (0 mM) & Aroclor1260	17.52	6.73×10^{-7}	60 h
		TCE (0.05 mM) & Aroclor1260	12.22	4.69×10^{-7}	84 h
		TCE (0.1 mM) & Aroclor1260	13.48	5.18×10^{-7}	72 h
	Inhibitory effect of TCE	TCE (0.15 mM) & Aroclor1260	0.37	1.41×10^{-8}	50 days
		TCE (0.25 mM) & Aroclor1260	0.43	1.63×10^{-8}	52 days
		TCE (0.3 mM) & Aroclor1260	0.12	3.61×10^{-9}	60 days
		TCE (0.4 mM) & Aroclor1260	0.09	6.83×10^{-9}	71 days
		TCE (0.7 mM) & Aroclor1260	0.08	5.72×10^{-9}	71 days

Table S2 PCB congener concentrations in PCE pre-grown cultures at different time points

IUPAC#	Structure	Aroclor 1260	0.3 mM PCE pre-cultivation (mole %)				0.7 mM PCE pre-cultivation (mole %)			1.4 mM PCE pre-cultivation (mole %)		
		0h	8 h	Day 1	Day 3	Day 8	3 h	Day 2	Day 8	4.5 h	Day 2	Day 5
PCB60	234-4	0.50	2.40	2.24	2.85	2.59	1.42	2.42	2.24	2.34	2.85	2.88
PCB101	245-25	4.44	6.43	7.02	8.97	8.28	5.29	7.06	6.72	6.36	8.49	8.69
PCB99	245-24	0.14	5.91	5.14	6.52	6.02	1.79	5.34	5.91	4.63	6.62	6.80
PCB110	236-34	1.84	3.21	4.12	3.85	3.84	2.21	3.13	3.38	2.88	3.75	3.91
PCB118	245-34	0.67	1.24	1.29	1.71	1.76	1.21	1.70	1.59	1.27	1.78	1.83
PCB114	4-2345	0.09	1.80	2.98	2.33	2.59	0.80	1.72	2.10	0.75	2.17	2.32
PCB82/151	234-23/2356-25	2.71	3.10	2.72	3.49	3.46	3.07	3.30	3.25	3.15	3.41	3.48
PCB144/124/135	2346-25/25-345/ 235-236	1.27	1.95	2.17	2.89	2.97	1.55	2.32	2.40	1.75	2.59	2.77
PCB149	236-245	10.60	9.99	8.47	10.91	10.92	11.92	10.59	10.43	10.46	10.84	11.00
PCB146	235-245	1.37	5.64	6.51	8.96	9.95	2.57	6.30	7.12	4.73	7.89	8.41
PCB153	245-245	9.00	8.39	6.68	8.56	8.54	8.60	8.51	8.87	8.85	8.65	8.57
PCB132/105	234-236/234-34	3.55	3.97	3.01	3.94	3.95	4.91	5.25	4.48	4.40	4.53	4.41
PCB141	2345-25	3.48	0.00	0.00	0.00	0.00	1.92	0.00	0.00	0.00	0.00	0.00
PCB130	234-235	1.42	2.35	0.82	1.00	0.95	2.14	2.17	2.03	2.15	1.38	1.18
PCB138	234-245	8.97	4.96	3.52	4.44	4.25	8.58	5.69	5.34	6.09	4.60	4.47
PCB158	2346-34	3.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PCB126	34-345	1.46	1.80	2.16	3.06	3.47	1.86	2.36	2.49	1.81	2.66	2.93
PCB179	2356-236	1.88	2.56	2.04	2.77	2.76	2.73	3.47	3.01	3.39	2.85	2.75
PCB183	2346-245	2.31	1.23	0.48	0.50	2.08	2.29	1.38	1.13	1.60	0.77	0.56
PCB185	23456-25	0.56	0.20	0.00	0.00	0.00	0.52	0.23	0.18	0.32	0.12	0.00
PCB174	2345-236-	3.97	1.99	0.70	0.71	0.34	3.58	1.87	1.57	2.74	1.21	0.98
PCB171/156	2346-234/2345-34	1.67	0.87	0.49	0.59	0.57	1.46	0.94	0.90	1.13	0.72	0.71
PCB172	2345-235	0.96	0.62	0.27	0.00	0.00	1.03	0.76	0.70	0.74	0.38	0.33
PCB180	2345-245	10.58	3.61	1.23	1.27	1.69	7.44	4.41	2.96	5.71	2.09	1.72
PCB193	2356-345	0.84	1.07	0.75	0.99	0.89	0.88	0.95	1.01	0.99	0.78	0.80
PCB170	2345-234	4.16	1.63	0.55	0.57	0.00	3.21	1.57	1.38	2.39	0.99	0.82
PCB198	23456-235	2.34	0.00	0.00	0.00	0.00	3.75	2.79	0.00	2.77	0.00	0.00
PCB199	2345-2356	2.29	2.03	1.27	1.80	1.36	2.47	2.04	1.96	2.25	1.73	1.58
PCB208/195	23456-2356/ 23456-234	0.87	0.59	0.32	0.33	0.28	0.83	0.61	0.57	0.77	0.49	0.43
PCB194	2345-2345	1.59	1.07	0.59	0.59	0.47	1.53	1.01	0.99	1.36	0.81	0.71
PCB206	23456-2345	0.54	0.44	0.32	0.36	0.39	0.51	0.48	0.48	0.53	0.44	0.40