Supplementary Materials

Long-term effects of mercury on biofilms grown in contaminated microcosms

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Table S1: Average pH, temperature and concentration of dissolved organic carbon, trace metals and major anions/cations of the Geneva Lake water (± SD, n=3).

Variables and dissolved metals	Average values
pH	8.2 ± 0.2
T (°C)	22 ± 2
DOC ($mg.L^{-1}$)	1.4 ± 0.2
As (nM)	13.6 ± 0.2
Br^- (µM)	0.4 ± 0.1
Ca^{2+} (mM)	1.14 ± 0.03
Cl^- (mM)	0.24 ± 0.04
Cu (nM)	8.09 ± 0.49
Cr (nM)	2.98 ± 0.22
F^- (µM)	3.7 ± 0.5
K^+ (µM)	39.4 ± 0.3
Mg^{2+} (µM)	194 ± 1
Mo (nM)	13.5 ± 0.1
Na^+ (µM)	290 ± 1
Ni (nM)	8.8 ± 0.2
NO_3^- (µM)	30.6 ± 6.4
Pb (nM)	0.69 ± 0.03
SO_4^{2-}(µM)	354 ± 74
Zn (nM)	9.5 ± 0.8

Table S2: Taxonomic ranks of the major microorganisms living in biofilms as well as the number of sequences and their abundance (%) calculated with OTUs assigned to (I) bacteria and (II) microalgae after 55 days cultivation in Hg. The abundance was calculated by dividing the specific of number of sequences assigned to an OTU to the total number of sequences, multiplied by 100.

(I)

	Phylum	Class	Order	Familly	Genus	Species	Number of sequence	Abundance (%)*
Control	*Proteobacteria*	*Betaproteobacteria*	*Burkholderiales*	Unknown	Unknown	Unknown	126	9.9
	Proteobacteria	*Betaproteobacteria*	Unknown	Unknown	Unknown	Unknown	118	9.3
	Cyanobacteria	*Cyanobacteria*	*Chroococcales*	*Chroococcales*	*Synechococcus*	Unknown	98	7.7
	Proteobacteria	*Gammaproteobacteria*	Unknown	Unknown	Unknown	Unknown	61	4.8
	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	51	4.0
	Proteobacteria	Unknown	Unknown	Unknown	Unknown	Unknown	39	3.1
	Bacteroidetes	Unknown	Unknown	Unknown	Unknown	Unknown	33	2.6
Microcosm 1 (11 pM)	*Proteobacteria*	*Betaproteobacteria*	Unknown	Unknown	Unknown	Unknown	477	22.3
	Proteobacteria	*Betaproteobacteria*	*Burkholderiales*	Unknown	Unknown	Unknown	282	13.2
	Proteobacteria	Unknown	Unknown	Unknown	Unknown	Unknown	171	8.0
	Cyanobacteria	*Cyanobacteria*	Chroococcales	*Chroococcales*	*Synechococcus*	Unknown	52	2.4
	Cyanobacteria	*Cyanobacteria*	Unknown	Unknown	Unknown	Unknown	49	2.3
	Proteobacteria	*Betaproteobacteria*	*Rhodocyclales*	*Rhodocyclaceae*	Unknown	Unknown	47	2.2
	Actinobacteria	*Actinobacteria*	*Actinomycetales*	*Propionibacteriaceae*	*Propioniferax*	Unknown	45	2.1
Microcosm 2 (121 pM)	*Proteobacteria*	*Betaproteobacteria*	Unknown	Unknown	Unknown	Unknown	597	23.2
	Proteobacteria	*Betaproteobacteria*	*Burkholderiales*	Unknown	Unknown	Unknown	459	17.8
	Proteobacteria	Unknown	Unknown	Unknown	Unknown	Unknown	252	9.8
	Proteobacteria	*Betaproteobacteria*	*Burkholderiales*	*Burkholderiaceae*	Unknown	Unknown	75	2.9
	Proteobacteria	*Betaproteobacteria*	*Rhodocyclales*	*Rhodocyclaceae*	Unknown	Unknown	65	2.5
	Cyanobacteria	*Cyanobacteria*	Unknown	Unknown	Unknown	Unknown	47	1.8
	Proteobacteria	*Alphaproteobacteria*	*Sphingomonadales*	*Sphingomonadaceae*	*Sphingomonas*	Unknown	45	1.7
Microcosm 3 (1454 pM)	*Proteobacteria*	*Betaproteobacteria*	*Burkholderiales*	*Burkholderiaceae*	Unknown	Unknown	730	16.1
	Proteobacteria	*Betaproteobacteria*	Unknown	Unknown	Unknown	Unknown	599	13.2
	Proteobacteria	*Betaproteobacteria*	*Burkholderiales*	Unknown	Unknown	Unknown	347	7.7
	Proteobacteria	Unknown	Unknown	Unknown	Unknown	Unknown	165	3.6
	Proteobacteria	*Betaproteobacteria*	*Burkholderiales*	*Comamonadaceae*	Unknown	Unknown	148	3.3
	Proteobacteria	*Alphaproteobacteria*	*Sphingomonadales*	*Sphingomonadaceae*	*Sphingomonas*	Unknown	97	2.1

* The total number of sequences was 1269, 2144, 2573 and 4525 for biofilms grown in 11 ± 2 pM, 121 ± 9 pM and 1454 ± 54 pM Hg for 55 days, respectively.

(II)

	Phylum	Class	Order	Familly	Genus	Species	Number of sequence	Abundance (%)*
Control	*Chlorophyta*	*Chlorophyta*	*Sphaeropleales*	*Scenedesmaceae*	*Hylodesmus*	*singaporensis*	2995	24.9
	Bacillariophyta	*Bacillariophyceae*	Unknown	Unknown	Unknown	Unknown	2624	21.8
	Orchophyta	*Chrysophyceae*	*Chromulinales*	*Chromulinaceae*	Unknown	Unknown	2316	19.3
	Chlorophyta	Unknown	Unknown	Unknown	Unknown	Unknown	1193	9.9
	Bacillariophyta	*Bacillariophyceae*	*Achnanthales*	*Cocconeidaceae*	*Cocconeis*	Unknown	557	4.6
	Bacillariophyta	*Bacillariophyceae*	*Cymbellales*	*Cymbellaceae*	*Cymbella*	Unknown	201	1.7
	Bacillariophyta	*Bacillariophyceae*	*Naviculales*	*Naviculaceae*	*Navicula*	Unknown	154	1.3
Microcosm 1 (11 pM)	*Chlorophyta*	*Chlorophyta*	*Sphaeropleales*	*Scenedesmaceae*	Hylodesmus	*singaporensis*	864	43.1
	Chlorophyta	Unknown	Unknown	Unknown	Unknown	Unknown	488	24.3
	Bacillariophyta	*Coscinodiscophyceae*	*Thalassiosirales*	*Thalassiosiraceae*	Stephanodiscus	Unknown	128	6.4
	Bacillariophyta	*Bacillariophyceae*	*Achnanthales*	*Cocconeidaceae*	Cocconeis	Unknown	112	5.8
	Bacillariophyta	*Bacillariophyceae*	Unknown	Unknown	Unknown	Unknown	101	5.03
	Chlorophyta	*Chlorophyceae*	*Sphaeropleales*	*Mychonastaceae*	Mychonastes	Unknown	37	1.8
Microcosm 2 (121 pM)	*Chlorophyta*	*Chlorophyta*	*Sphaeropleales*	*Scenedesmaceae*	Hylodesmus	*singaporensis*	1043	18.5
	Bacillariophyta	*Bacillariophyceae*	Unknown	Unknown	Unknown	Unknown	981	17.4
	Bacillariophyta	*Fragilariophyceae*	*Fragilariales*	*Fragilariaceae*	Diatoma	tenue	638	11.3
	Chlorophyta	*Chlorophyta*	Unknown	Unknown	Unknown	Unknown	839	14.9
	Orchophyta	*Chrysophyceae*	*Chromulinales*	*Chromulinaceae*	Unknown	Unknown	277	4.9
	Bacillariophyta	*Bacillariophyceae*	*Achnanthales*	*Cocconeidaceae*	Cocconeis	Unknown	231	4.1
	Bacillariophyta	*Bacillariophyceae*	*Naviculales*	*Naviculaceae*	Navicula	Unknown	216	3.8
	Bacillariophyta	*Bacillariophyceae*	*Cymbellales*	*Cymbellaceae*	Cymbella	Unknown	157	2.8
Microcosm 3 (1454 pM)	*Chlorophyta*	*Chlorophyta*	*Sphaeropleales*	*Scenedesmaceae*	*Hylodesmus*	*singaporensis*	507	33.4
	Bacillariophyta	*Bacillariophyceae*	Unknown	Unknown	Unknown	Unknown	225	14.8
	Chlorophyta	Unknown	Unknown	Unknown	Unknown	Unknown	225	14.8
	Bacillariophyta	*Bacillariophyceae*	*Achnanthales*	*Cocconeidaceae*	*Cocconeis*	Unknown	217	14.3
	Chlorophyta	*Chlorophyta*	*Oedogoniales*	*Oedogoniales*	*Oedogonium*	Unknown	48	3.2
	Chlorophyta	*Chlorophyceae*	*Sphaeropleales*	*Mychonastaceae*	*Mychonastes*	Unknown	42	2.8

* The total number of sequences was 12023, 2006, 5624 and 1520 for biofilms grown in 11 ± 2 pM, 121 ± 9 pM and 1454 ± 54 pM Hg for 55 days, respectively.

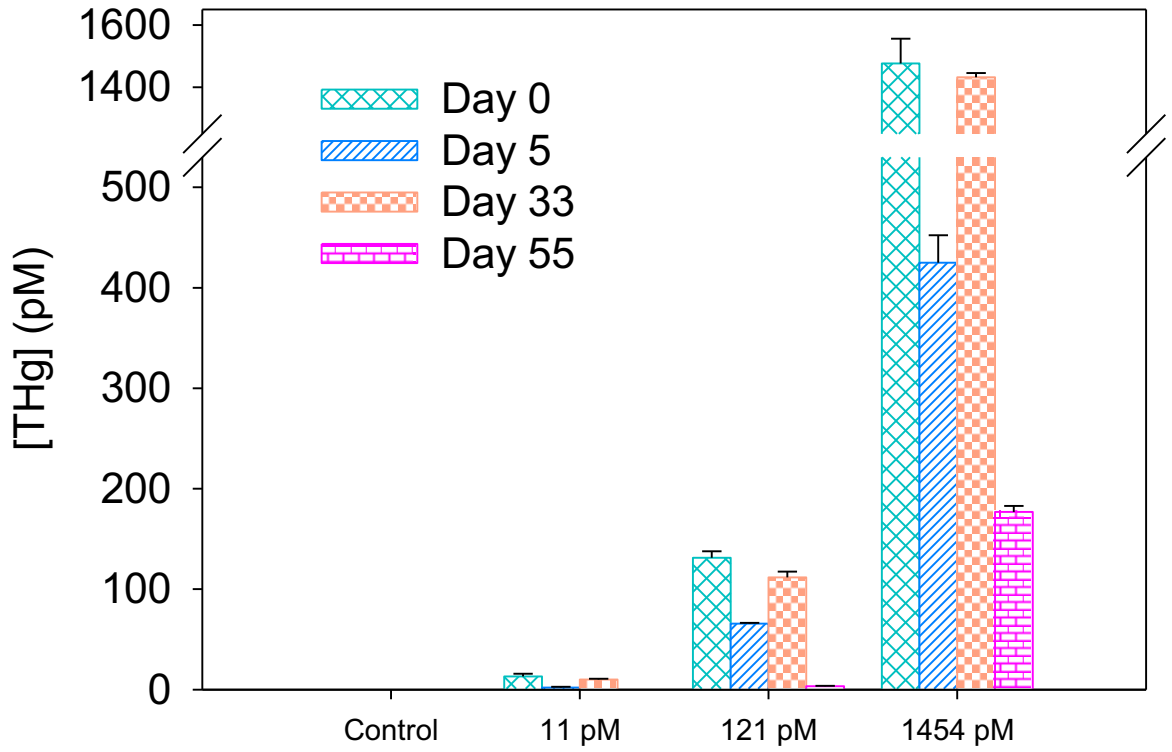

Figure S1. Measured dissolved Hg concentrations in microscoms at the beginning of the exposure (measured after Hg addition, Day 0) and after 5, 33 and 55 days of cultivation.

(I) (II)

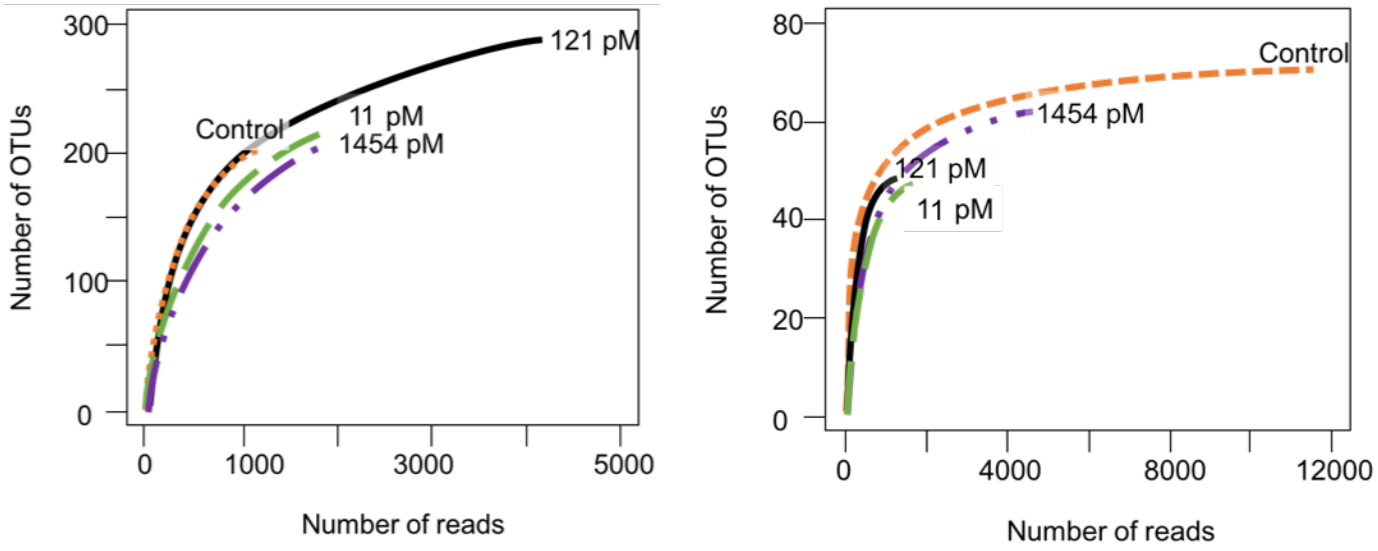

Figure S2. Rarefaction curves from the amplicon sequencing of (I) bacteria and (II) microalgae in control biofilm and in biofilms grown in 11 ± 2 pM, 121 ± 9 pM and 1454 ± 54 pM Hg for 55 days.