

Article

Removal of Pb(II) by Pellicle-Like Biofilm-Producing *Methylobacterium hispanicum* EM2 Strain from Aqueous Media

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Table S1. The phenotypic characteristics of *Methylobacterium hispanicum* strain EM2.

Characteristics	<i>Methylobacterium hispanicum</i> EM2
Gram staining	–
Colony color	Pink
Cell shape	Rod
Cell length (µm)	
cell length	3.6 (±0.6)
cell width	0.12 (±0.2)
Motility	+
Temperature range (°C)	20–40
NaCl range (%)	0–1
pH range	5–8
Production of acid from glucose	–
Production of indole	–
Nitrate reduction	+
Enzyme activity	
catalase	+
oxidase	w
arginine dihydrolase	–
urease	+
β-glucosidase	–
β-galactosidase	–
protease	–
Assimilation	
D-glucose	–
L-arabinose	–
D-mannose	–
D-mannitol	–
N-acetyl-glucosamine	–
D-maltose	–
potassium gluconate	+
capric acid	–
adipic acid	–
maleic acid	+
trisodium citrate	+
phenyl acetic acid	–

w, weak; –, negative; +, positive

Table S2. Pb(II) removal from sewage water by the EM2 strain.

Metals in Sewage Water	EM2 Treatment		Removal Efficiency (%)
	before	after	
Pb(II)	9.61 ± 0.07 mg/L	0.279 ± 0.1 mg/L	97.1
Ni(II)	20.67 ± 0.23 µg/L	13.86 ± 0.07 µg/L	32.9
Co(II)	4.96 ± 1.1 µg/L	N.D*	-
Zn(II)	238.82 ± 2.43 µg/L	132.24 ± 5.23 µg/L	44.6
Cd(II)	0.461 ± 0.042 µg/L	N.D	-

*N.D; not determined

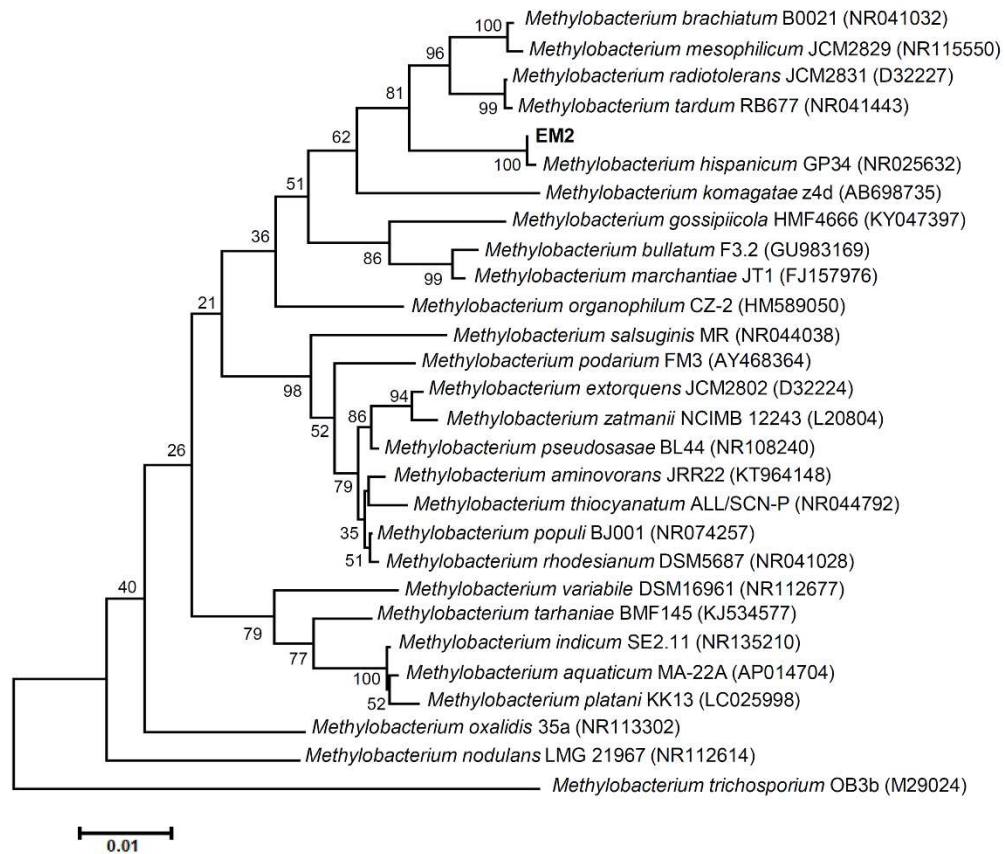


Figure S1. Phylogenetic based on 16S rRNA sequences, showing the relationships between *Methylobacterium hispanicum* strain EM2 and other members of the genus *Methylobacterium*. The numbers at the nodes indicate the level of bootstrap support based on the neighbor-joining analysis of 1000 replicates. Accession numbers are given in parenthesis. Bar, 0.01 substitutions per nucleotide position.

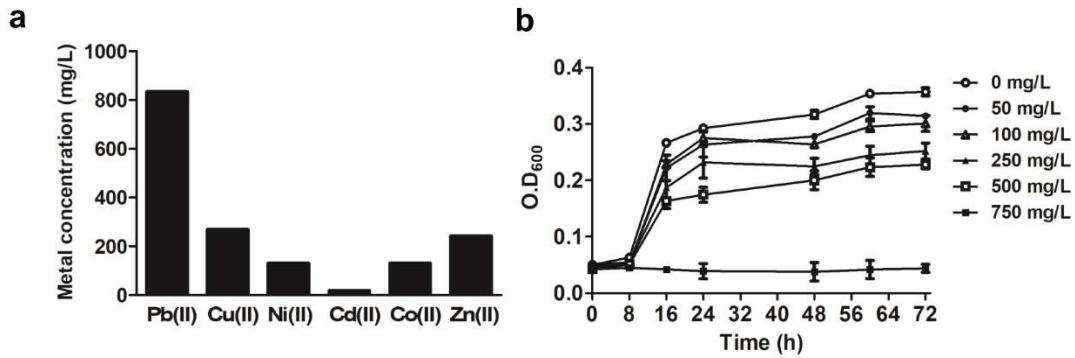


Figure S2. Investigation of the resistance of the EM2 strain to different metals. (a) Analysis of the minimal inhibitory concentrations (MICs) of various metal ions. (b) Growth profile of the EM2 strain under different PbCl₂ concentrations. The values and error bars represent the means ± standard deviation (n = 3).

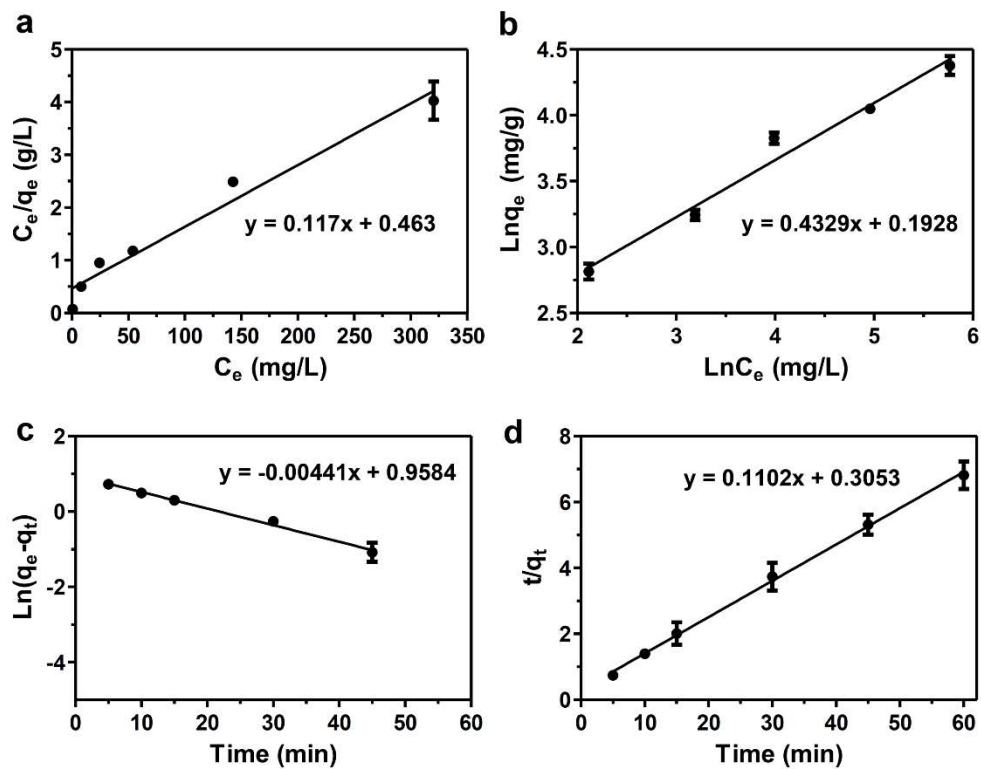


Figure S3. Linearization plots of modelling biosorption isotherms and kinetics of EM2 strain. (a) Langmuir, (b) Freundlich isotherm, (c) pseudo-first order, and (d) pseudo-second order. Values and error bars represent means ± SD (n = 3).

