

Supplementary data

Effects of aniline-promoted electron shuttle-mediated goethite reduction by *Shewanella oneidensis* MR-1 and degradation of aniline

Mengmeng Tang, Chaoyong Wang *, Zaitian Dong, Qianjin Che, Zetang Wang and Yuxuan Zhu

*Corresponding author. Email: wangcy@cumt.edu.cn

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Table S1 Effect of different concentrations of AQS on Fe (II) production in the bio-reduction process of goethite. Fe (II) content in the reaction system (Data for Fig. 2 a)

Group	0h	8h	20h	32h	48h	72h
GT+MR-1	0.00±0.00Da	50.58±10.00Cb	67.00±12.02Cb	99.37±14.02Bc	116.28±13.02Bc	143.33±11.02Ad
GT+MR-1+0.1 mM AQS	0.00±0.00Fa	59.76±12.01Eb	90.68±14.03Dab	135.12±13.02Cb	190.70±11.01Bb	230.98±15.00Ac
GT+MR-1+0.3 mM AQS	0.00±0.00Fa	54.44±12.02Eb	92.50±14.02Db	140.81±23.02Cb	210.57±18.02Bb	260.92±13.26Ab
GT+MR-1+0.5 mM AQS	0.00±0.00Fa	81.49±9.88Ea	125.11±19.85Da	210.61±13.85Ca	250.86±8.37Ba	320.91±4.65Aa

Data are presented as mean ± SD (n=3). The same uppercase letters in the same row indicate that the difference is not significant, otherwise the difference is significant; the same lowercase letters in the same column indicate that the difference is not significant, otherwise the difference is significant.

Table S2 Effect of different concentrations of aniline on the production of Fe (II) during AQS-mediated goethite bio-reduction (Data for Fig. 3)

Group	0h	8h	20h	32h	48h	72h
GT+Aniline	0.00±0.00Aa	0.00±0.00Ac	0.00±00.00Ad	0.00±00.00Ad	0.00±0.00Ad	0.00±0.00Ad
GT+MR-1+1 µM Aniline	0.00±0.00Fa	40.50±12.02Eb	70.00±14.02Dc	105.37±13.02Cc	130.28±11.02Bc	185.32±15.00Ac
GT+MR-1+0.5 mM AQS+1µM Aniline	0.00±0.00Fa	50.44±12.02Eb	108.22±14.02Dab	160.81±23.02Cab	200.57±18.02Bb	260.92±13.26Ab
GT+MR-1+0.5 mM AQS+3µM Aniline	0.00±0.00Ea	81.50±17.02Da	120.11±20.02Da	180.61±25.02Ca	265.86±22.02Ba	340.91±35.22Aa
GT+MR-1+0.5 mM AQS+7µM Aniline	0.00±0.00Da	59.76±17.02Cb	90.68±20.02Cbc	135.12±15.02Bbc	190.7±23.02Ab	224.98±18.22Abc

Data are presented as mean ± SD (n=3). The same uppercase letters in the same row indicate that the difference is not significant, otherwise the difference is significant; the same lowercase letters in the same column indicate that the difference is not significant, otherwise the difference is significant.

Table S3 Consumption of sodium lactate during AQS-mediated Fe (III) bio-reduction. (Data for Fig. 4a)

Group	0h	8h	20h	32h	48h	72h
GT+MR-1	1.00±0.00Aa	0.97±0.03Ba	0.94±0.02Ca	0.91±0.02Da	0.89±0.03Ea	0.87±0.02Ea
GT+MR-1+0.1 mM AQS	1.00±0.00Aa	0.95±0.02Bab	0.84±0.03Cb	0.75±0.02Db	0.60±0.02Eb	0.50±0.03Fb
GT+MR-1+0.3 mM AQS	1.00±0.00Aa	0.92±0.02Bb	0.71±0.03Cc	0.65±0.01Dc	0.55±0.03Ec	0.39±0.04Fc
GT+MR-1+0.5 mM AQS	1.00±0.00Aa	0.85±0.02Bc	0.64±0.02Cd	0.55±0.03Dd	0.41±0.02Ed	0.31±0.02Fd

Data are presented as mean ± SD (n=3). The same uppercase letters in the same row indicate that the difference is not significant, otherwise the difference is significant; the same lowercase letters in the same column indicate that the difference is not significant, otherwise the difference is significant.

Table S4 Impact of aniline on sodium lactate consumption during AQS-mediated Fe (III) bio-reduction (Data for Fig. 4 c)

Group	0h	8h	20h	32h	48h	72h
GT+MR-1+1μM Aniline	1.00±0.00Aa	0.97±0.02Ba	0.87±0.02Ca	0.84±0.03Ca	0.75±0.02Da	0.73±0.02Da
GT+MR-1+0.5mM AQS	1.00±0.00Aa	0.85±0.02Bbc	0.66±0.02Cc	0.56±0.03Dc	0.43±0.01Ec	0.31±0.03Fd
GT+MR-1+0.5mM AQS+1μM Ani line	1.00±0.00Aa	0.83±0.01Bc	0.76±0.02Cb	0.63±0.03Db	0.55±0.02Eb	0.35±0.02Fc
GT+MR-1+0.5mM AQS+3μM Ani line	1.00±0.00Aa	0.77±0.01Bd	0.61±0.02Cc	0.50±0.03Dc	0.38±0.02Ec	0.28±0.02Fd
GT+MR-1+0.5mM AQS+7μM Ani line	1.00±0.00Aa	0.86±0.02Bb	0.78±0.02Cb	0.66±0.03Db	0.53±0.02Eb	0.45±0.02Fb

Data are presented as mean ± SD (n=3). The same uppercase letters in the same row indicate that the difference is not significant, otherwise the difference is significant; the same lowercase letters in the same column indicate that the difference is not significant, otherwise the difference is significant.

Table S5 Change in aniline concentration (Data for [Fig. 5 a](#))

Group	0h	8h	20h	32h	48h	72h
GT+MR-1+1 μ M Aniline	1.00 \pm 0.00Aa	0.87 \pm 0.05Bb	0.75 \pm 0.02Cb	0.65 \pm 0.05Db	0.44 \pm 0.04Eb	0.39 \pm 0.02Eb
GT+MR-1+0.5mM AQS+1 μ M Aniline	1.00 \pm 0.00Aa	0.90 \pm 0.02Bab	0.70 \pm 0.03Cc	0.63 \pm 0.03Db	0.47 \pm 0.03Eb	0.43 \pm 0.03Fab
GT+MR-1+0.5mM AQS+3 μ M Aniline	1.00 \pm 0.00Aa	0.81 \pm 0.02Bc	0.62 \pm 0.03Cd	0.45 \pm 0.03Dc	0.32 \pm 0.04Ec	0.25 \pm 0.04Fc
GT+MR-1+0.5mM AQS+7 μ M Aniline	1.00 \pm 0.00Aa	0.94 \pm 0.04Ba	0.83 \pm 0.03Ca	0.74 \pm 0.03Da	0.65 \pm 0.03Ea	0.47 \pm 0.02Fa

Data are presented as mean \pm SD (n=3). The same uppercase letters in the same row indicate that the difference is not significant, otherwise the difference is significant; the same lowercase letters in the same column indicate that the difference is not significant, otherwise the difference is significant.