

Supplementary data

Oxidative stress resistance prompts pyrroloquinoline quinone biosynthesis
in *Hyphomicrobium denitrificans* H4-45

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Table S1 All strains used in this study

Strains	Description	Sources
<i>H. denitrificans</i> H4-45	Wild type	This study
<i>H. denitrificans</i> AC-6	Best-performing isolate in the first stage of UV-LiCl mutagenesis and ALE	This study
<i>H. denitrificans</i> AD-17	Best-performing isolate in the second stage of UV-LiCl mutagenesis and ALE	This study
<i>H. denitrificans</i> AE-9	Best-performing isolate in the third stage of UV-LiCl mutagenesis and ALE	This study

Figure Legends

Fig. S1 Effects of different UV treatment times on the mortality of strain H4-45

Fig. S2 Determination of initial concentration of three screening stress in the three rounds of ALE: (a) Kanamycin, (b) Na₂S (c) K₂TeO₃

Fig. S3 Standard curve of PQQ measured by HPLC with different PQQ concentrations (9.4 mg/L, 18.8 mg/L, 37.5 mg/L, 75 mg/L, 150 mg/L, 300 mg/L)

Fig. S4 PQQ production of selected strains after the first stage of UV-LiCl mutagenesis and ALE

Fig. S5 PQQ production of selected strains after the second stage of UV-LiCl mutagenesis and ALE

Fig. S6 Genetic stability of mutant strain AE-9 after nine consecutive passages

Fig. S7 OD₆₀₀ of mutant strain AE-9 in the MM medium with no pressure, full concentration of kanamycin+Na₂S+K₂TeO₃ treatment, and half concentration of kanamycin+Na₂S+K₂TeO₃ treatment

Fig. S8 Batch fermentation of PQQ production in a 3.7 L bioreactor without pH adjustment

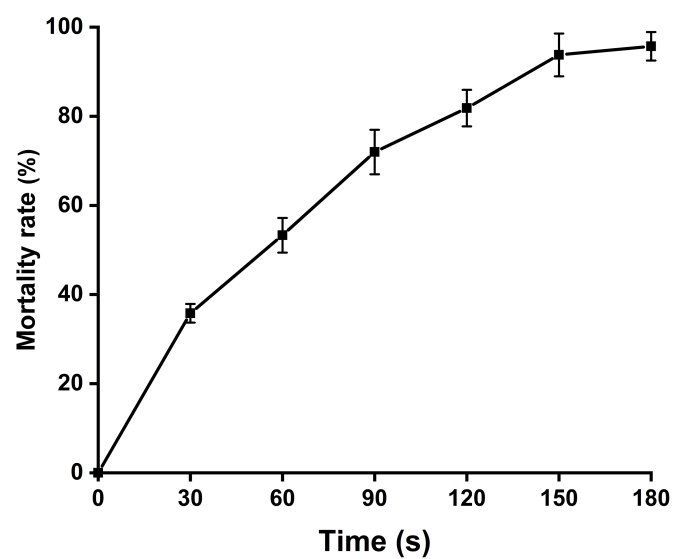


Fig. S1 Effects of different UV treatment times on the mortality of strain H4-45

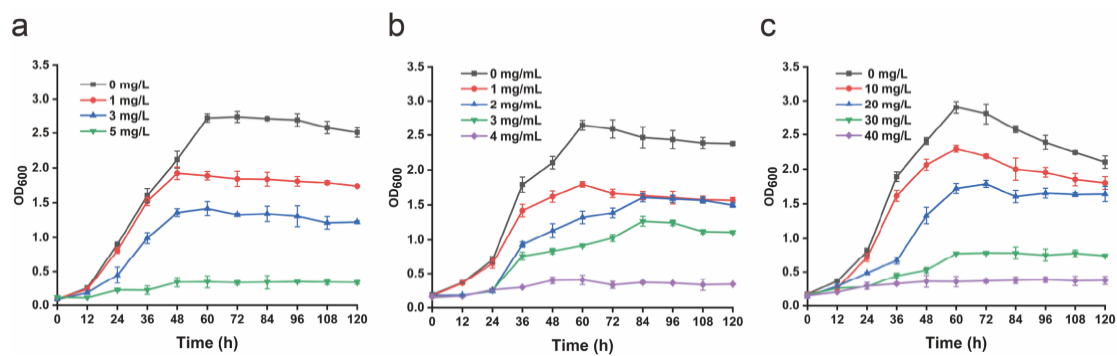


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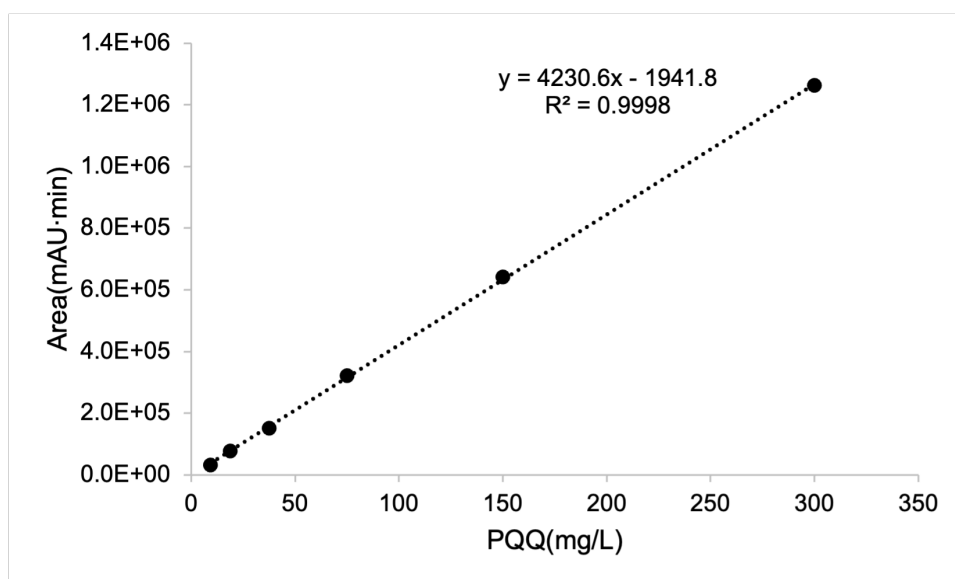


Fig. S3 Standard curve of PQQ measured by HPLC with different PQQ concentrations (9.4 mg/L, 18.8 mg/L, 37.5 mg/L, 75 mg/L, 150 mg/L, 300 mg/L).

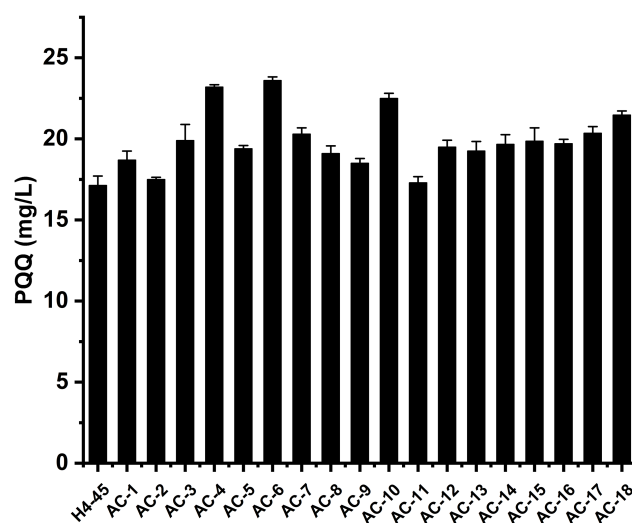


Fig. S4 PQQ production of selected strains after the first stage of UV-LiCl mutagenesis and ALE

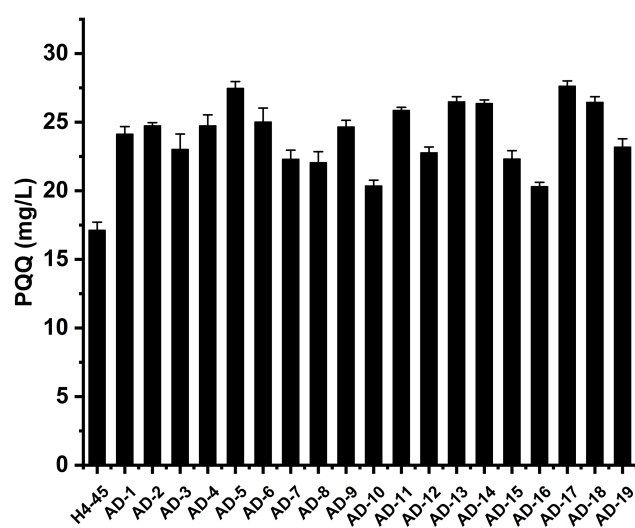


Fig. S5 PQQ production of selected strains after the second stage of UV-LiCl mutagenesis and ALE

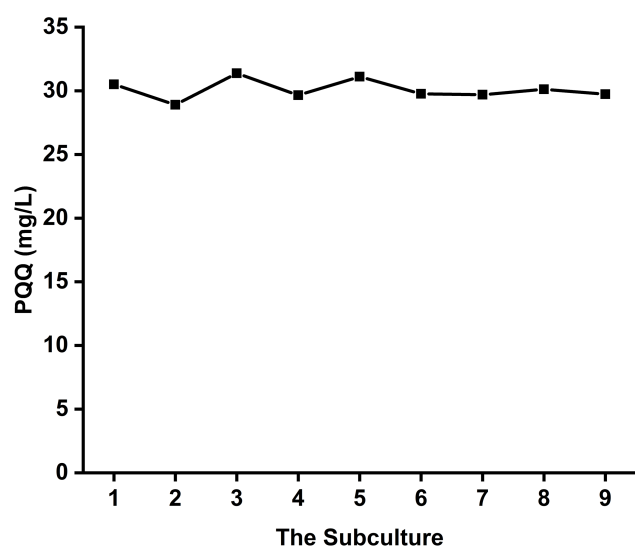


Fig. S6 Genetic stability of mutant strain AE-9 after nine consecutive passages

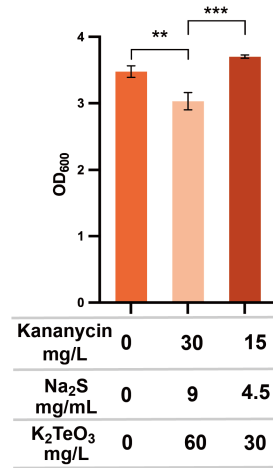


Fig. S7 OD₆₀₀ of mutant strain AE-9 in the MM medium with no pressure, full concentration of kanamycin+Na₂S+K₂TeO₃ treatment, and half concentration of kanamycin+Na₂S+K₂TeO₃ treatment.

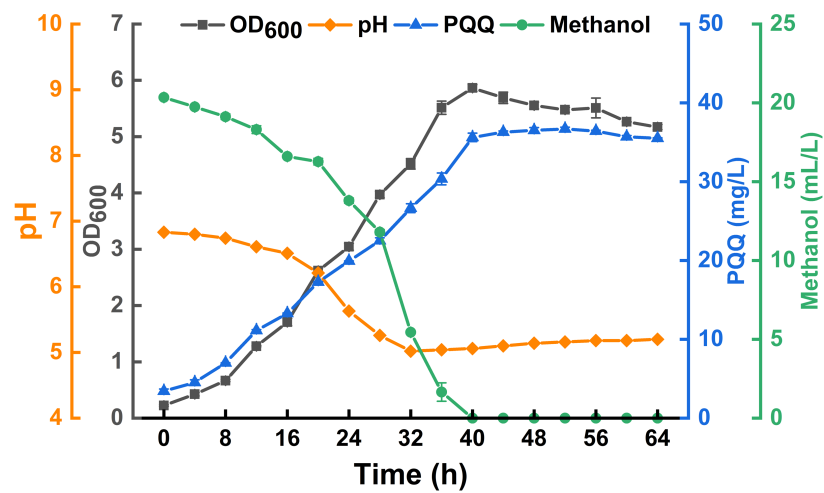


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