

Different regulating strategies of arsenite oxidation by *Thermus tengchongensis* from hot spring

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Microorganisms play a vital role in environmental arsenic transformation. In this study, two strains, designed Y and W, were isolated from Rehai geothermal area of tengchong, Yunnan, the southwestern China. 16S rRNA gene sequence showed they belong to *Thermus tengchongensis*, which the similarity being 99.74 % and 99.48 %, respectively. However, the arsenite oxidizing rates were distinctly different with the two strains. They both oxidized As(III) by AioBA enzyme system, but with different gene regulation strategies. Genomic sequencing analysis indicated that Y has an intact operon, while there is absence *aioR* gene for W. RT-PCR result demonstrated that expression of arsenite oxidation gene have two regulatory model types, which Y was constitutive expression and W was regulated expression. The diversity of arsenite oxidation regulatory models provides better understanding of the microbial mechanisms of arsenic transformation in hot spring.