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Atrazine degradation by *Arthrobacter* sp. ZXY-2: Kinetics, pathway, gene expression response and genomic characterization

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Isolation of atrazine-degrading microorganisms with specific characteristics is significant for the bio-augmentation to deal with atrazine wastewater. However, lacking the investigation of specific characteristics will hinder the further understanding of bio-augmentation. A strain *Arthrobacter* sp. ZXY-2 with strong capacity of atrazine degradation has been isolated and suggested a potential candidate for bio-augmentation. In this study, we identified the factors that might be relevant to the biodegradation capacity of strain ZXY-2, and reveal how these factors might contribute to the future understanding of bio-augmentation. The growth pattern of strain ZXY-2 followed Haldane-Andrew model with the inhibition constant (K_i) of 52.76 mg/L obtained, indicating that the strain ZXY-2 offered a possibility of bio-augmenting wastewater with the concentration of atrazine below 52.76 mg/L. The Real-time quantitative PCR (RT-qPCR) results showed a positive correlation between atrazine degradation and the expression levels of functional genes (*trzN*, *atzB* and *atzC*), which provided a basis data that could help to distinguish the role strain ZXY-2 played in the bio-augmentation. Moreover, the multiple copies of *atzB* gene, found via genome sequencing, might account for the highest expression levels among three genes. Meanwhile, the multiple copies of *atzB* gene might also provide a compensation mechanism to ensure the smooth work of strain ZXY-2 in future bio-augmentation.

Biography

Xinyue Zhao completed her Master's degree in Environmental Microbiology at Harbin Institute of Technology (HIT) in July 2014. Then, she continued her PhD research, majored in Environmental Science and Engineering as a visiting scholar-PhD student from September 2016 at Delft University of Technology. She has published six papers during her PhD study.

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