

Novel microorganism has potential to treat high-ammonium wastewater

February 23 2021, by Li Yuan



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Water pollution has become increasingly serious, and the main pollutant in most water bodies is nitrogen. Microbial nitrification/denitrification is one of the most effective nitrogen removal pathways for wastewater.

Generally, the traditional processes of microbial nitrogen removal include two parts: aerobic nitrification and anaerobic denitrification. Nitrification and denitrification can be carried out simultaneously in one reactor by a class of microorganisms—heterotrophic nitrification-aerobic denitrification (HN-AD) bacteria.

A research group led by Prof. Wu Jinshui from the Institute of Subtropical Agriculture (ISA) of the Chinese Academy of Sciences isolated a novel heterotrophic nitrification-aerobic denitrification bacterium—*Alcaligenes faecalis* WT14, which has the potential to treat high-ammonium wastewater.

The study was published in *Journal of Environmental Management* on Jan. 16.

The researchers found WT14 could tolerate high concentration ammonia nitrogen ($\text{NH}_4^+ \text{-N}$) up to $2000 \text{ mg} \cdot \text{L}^{-1}$ and had an efficient $\text{NH}_4^+ \text{-N}$ removal rate of $55.9 \text{ mg} \cdot \text{L}^{-1} \cdot \text{h}^{-1}$.

Unlike other *Alcaligenes faecalis* species, WT14 could efficiently remove high concentration nitrate ($\text{NO}_3^- \text{-N}$) or nitrite ($\text{NO}_2^- \text{-N}$) when they are the sole nitrogen sources.

These results implied that WT14 is a novel *Alcaligenes faecalis* strain and has the potential for treating wastewater containing high-strength $\text{NH}_4^+ \text{-N}$, $\text{NO}_3^- \text{-N}$, or $\text{NO}_2^- \text{-N}$.

More information: Junli Chen et al. Nitrogen removal characteristics of a novel heterotrophic nitrification and aerobic denitrification bacteria, *Alcaligenes faecalis* strain WT14, *Journal of Environmental Management* (2021). [DOI: 10.1016/j.jenvman.2021.111961](https://doi.org/10.1016/j.jenvman.2021.111961)

Provided by Chinese Academy of Sciences

Citation: Novel microorganism has potential to treat high-ammonium wastewater (2021, February 23) retrieved 20 April 2024 from <https://phys.org/news/2021-02-microorganism-potential-high-ammonium-wastewater.html>

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