

عنوان مقاله:

Enhanced nitrogen removal by a heterotrophic nitrifying-aerobic denitrifying bacterial consortium with potential for the treatment of high-strength ammonium wastewater

محل انتشار:

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خلاصه مقاله:

Introduction: Nitrogen compounds are used in various industries and cause pollution of water and soil. As a result, the bioremediation of nitrogen compounds from the environment becomes an important issue. In this way, the use of microorganisms as a consortium has enhanced bioremediation. This study aimed to remove inorganic nitrogen forms by heterotrophic nitrifying-aerobic denitrifying (HN-AD) bacterial consortium and compare it to pure cultures. **Materials and Methods:** HN-AD bacteria were isolated from soil and aquarium water and identified. After that, the bacterial consortium was prepared from two isolated bacteria and two strains from the microbiological culture collection of the University of Isfahan (Iran). The ability to remove ammonium, nitrite, and nitrate was assayed using spectrophotometry for both pure cultures and the consortium. **Results:** *Pseudomonas mendocina* AquaN and *Pseudomonas monteilii* Nht were isolated and identified for their efficient capabilities in HN-AD. The bacterial consortium including two isolated bacteria and *Acinetobacter calcoaceticus* SCC2, *Rhodococcus erythropolis* R1 was able to consume NH_4^+-N (85.6 mg.L^{-1}), NO_2--N (23.1 mg.L^{-1}), and NO_3--N (102.5 mg.L^{-1}) as sole nitrogen sources by removal efficiencies 98.4%, 90.5%, and 40.0%, respectively that were better than pure cultures performances. Specifically, the consortium was capable of removing 250 to 2045 mg.L^{-1} NH_4^+-N with up to 95% efficiency within 48h. **Discussion and Conclusion:** The compatibility of the strains as a consortium was considerable and the bacterial consortium showed significant performances in nitrogen removal, especially the removal of 2045 mg.L^{-1} NH_4^+-N . These findings indicated the bacterial consortium could be a promising candidate for the treatment of high-strength ammonium wastewater.

کلمات کلیدی:

Acinetobacter, کنسرسیون، نیتریفیکاسیون هتروتروفی، حذف غلظت های بالای آمونیم، *Pseudomonas*, *Rhodococcus*

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