

A strain of *Pseudomonas* sp. isolated from piggery wastewater treatment systems with heterotrophic nitrification capability in Taiwan

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摘要

Abstract

A high concentration of NH_4^+ in piggery wastewater is major problem in Taiwan. Therefore, in our study, we isolated native heterotrophic nitrifiers for piggery wastewater treatment. Heterotrophic nitrifier AS-1 was isolated and characterized from the activated sludge of a piggery wastewater system. Sets of triplicate crimp-sealed serum bottles were used to demonstrate the heterotrophic nitrifying capability of strain AS-1 in an incubator at 30 degrees C. All serum bottles contained 80 mL medium, and the remainder of the bottle headspace was filled with pure oxygen. The experimental results showed that 2.5 ± 0.2 mmol L^{-1} NH_4^+ was removed by 58 hours, and, eventually, 1.5 ± 0.5 mmol L^{-1} N_2 and 0.2 ± 0.0 mmol L^{-1} N_2O were produced. The removal rate of NH_4^+ by the strain AS-1 was 1.75 mmol NH_4^+ g cell $^{-1}$ h $^{-1}$. This strain was then identified as *Pseudomonas alcaligenes* (97% identity) by sequencing its 16S rDNA and comparing it with other microorganisms. Thus, strain AS-1 displays high promise for future application for in situ NH_4^+ removal from piggery wastewater.