

## عنوان مقاله:

Anammox enrichment and constructed wetland inoculation for improvement of wastewater treatment performance

## محل انتشار:

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## خلاصه مقاله:

This study contributes to the improvement of low-cost biotechnology for wastewater treatment in constructed wetlands (CWs). Constructed wetlands are energy efficient engineered systems that mimic the treatment processes of natural wetlands, removing polluting organic matter, nutrients, and pathogens from water. The aim of this study was to investigate the advisability of the inoculation of horizontal subsurface flow constructed wetlands with the enriched biomass of anaerobic ammonium oxidation (anammox) bacteria to enhance nitrogen removal. Contaminants removal in constructed wetlands occurs mainly due to the biological transformations caused by indigenous water-borne microorganisms. However, the role of different microbial mechanisms is still unknown. To estimate the role of the anammox process in wetlands the laboratory-scale fixed bed reactor planted with *Juncus effusus* was inoculated with enriched biomass of anammox bacteria and fed with synthetic wastewater containing ammonium-nitrogen as the main contaminant. In order to obtain the active enriched culture of anammox bacteria, an upflow anaerobic fixed bed reactor inoculated with activated sludge from a municipal wastewater treatment plant was run. The reactor was fed with enrichment medium containing ammonium and nitrite in high concentrations. After 270 days of operation, nitrite was not found in measurable levels, the concentration of ammonium had slightly increased, and the concentration of nitrate in the reactor had significantly dropped compared to its level at the initial phase. The microbial association, which had developed in the enrichment reactor, allowed continuous removal of ammonium and nitrite. The anammox bacteria abundance in the reactor accounted for approximately 95% of total biomass.

## کلمات کلیدی:

Wastewater, Wetlands, Bioreactors, Nitrogen, Ammonium, Bacteria

## لینک ثابت مقاله در پایگاه سیویلیکا:

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