



Universität Stuttgart



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Universität Stuttgart · WAREM · Pfaffenwaldring 7a · 70569 Stuttgart

WAREM Seminar

June 24, 2014

Master's Thesis Presentation

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Investigations on ammonium removal in constructed wetlands for wastewater treatment – Laboratory scale experiments

A research on inorganic nitrogen compounds removal using four different horizontal subsurface flow constructed wetlands was carried out in the Helmholtz Centre for Environmental Research in Leipzig, Germany. Two of the planted wetlands received only ammonium as contaminant source while the other planted and unplanted received additional organic carbon source, dimethylphenols. The concentration of both contaminants was changed over the experimental period to study their influence on nitrogen removal. It was also attempted to test Anammox method of treatment by inoculating one of the experimental wetlands with Anammox bacteria. An average of 90% ammonium removal was achieved in all the planted wetlands until the concentration of both contaminants (ammonium and dimethylphenols) were increased to 40 mg/L. After the increment, ammonium removal efficiency reduced by 50% in the wetlands receiving only elevated ammonium concentration of 40 mg/L while almost no ammonium removal was observed in the planted wetland added with both contaminants (ammonium and dimethylphenols) with 40 mg/L each. However, the increased concentration of both the contaminants had no effect on dimethylphenols removal suggesting dimethylphenols kinetics being faster than ammonium oxidation. Along with the inoculation of anammox biomass into an experimental wetland, ammonium removal performance improved for about a month which declined later possibly due to flushing out of microbial biomass.

The results achieved showed the strong role of plants on contaminants removal efficiency. Also, physical parameters like pH, redox and dissolved oxygen helped to characterize the contaminant removal processes in different phases of experiments. The spatial distribution of total and anammox bacteria in these experimental wetlands showed different processes involved in contaminants removal beside nitrification and denitrification. However, a strong and clear conviction regarding anammox process within the inoculated experimental wetland could not be made as the experimental phase was short to derive any clear conclusion; thus further research was recommended.

Date: Tuesday, June 24, 2014

Time: 17:30

Location: Pfaffenwaldring 7a, WAREM old building (wooden building)

Auslandsorientierter Studiengang „Water Resources Engineering and Management - WAREM“

Program Coordinator
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WAREM Students and other interested parties are cordially invited.