Enzyme treatment improves the performance of laboratory-scale vertical flow constructed wetland

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Enzyme treatment improves the performance of laboratory-scale vertical flow constructed wetland

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Abstract

An enzyme treatment was developed and evaluated for its effectiveness in alleviating bioclogging through a laboratory-scale vertical-flow constructed wetland (VFCW) experiment in this study. The enzyme preparation was a combination of α-glucoamylase and β-glucanase. The results show that the enzyme treatment greatly reduced bioclogging, and the peak hydraulic conductivity after treatment increased by a factor of 16, mainly because polysaccharides in the clogging matter were decomposed and the gelatinous clogging matter was dissolved and dispersed. The results also show that the abundance of *Proteobacteria* microbes increased by 89.4% after the enzyme treatment, although the diversity of the microbial community within the substrate decreased slightly. These microbes can increase the capability of the constructed wetland to purify influent water, and thus the rate of reduction of COD improved. It offers a solution to the problem of bioclogging in constructed wetlands.

Keywords: constructed wetland; bioclogging; enzyme treatment; microbial community.

1 Introduction

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