

## Investigation of the water purification efficiency of land treatment system by using microbial community as an index

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Received 4 August 2010; Accepted in revised form 3 January 2011

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### ABSTRACT

Artificial land treatment system was constructed to remove nutrient salt in the sewage by the physicochemical and biochemical mechanisms of plants, microorganisms and soil. The aims of this research were to investigate the relationship between the water purification efficiency using the land treatment system and the variation of microbial community, and to study the interactive relation between microbial community and flora by observing the flora succession. The results showed that the vegetation coverage facilitated the soil steadiness. After the fortieth day, the average moisture content of soil and capacity of cation exchange in the restoration zone tended to steadiness due to the increase of vegetation coverage. Besides, the observed results indicated that the microbial community was affected by the flora succession. When composite plants became the dominant species, the *Aeromonas* family (*Aeromonas hydrophila/caviae*, *Aeromonas salmonicida*) and *Burkholderia cepacia* were the main species of bacteria in the two zones. However, when *Burkholderia cepacia* caused the phosphate-solubilizing so that removal rate of ortho-phosphate decreased. Summary all results displayed that microorganisms, plants and water quality have the interactive relation. Therefore, the study results of microbial community and flora succession could be used as an index for the water purification efficiency, which ensure that land treatment systems achieves optimal performance.

*Keywords:* Land treatment system; Second ecosystem; Microbial community; Nutrient salt

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