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水体污染控制与治理 专刊

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黑臭河水治理与水生植物生理响应的灰色分析

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Grey relational analysis of aquatic plants' physiological responses to malodorous water treatment

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摘要 以上海城区黑臭河水的生物-生态处理工艺为研究对象, 采用灰色理论分析水生植物在黑臭河水治理过程中的生理响应顺序, 为科学解释污染物净化机制提供依据. 结果显示, 植物的生理特性对COD和NH₄⁺-N去除的优先级关联排序均为POD>CAT>Chla>SP>Chlb, 表明反应体系对黑臭河水中COD和NH₄⁺-N的去除主要是通过微生物降解和转化途径. 但是, 植物的生理特性对TP去除的优先级关联排序为Chlb>SP>Chla>CAT>POD, 表明反应体系对黑臭河水中P的去除则主要是通过水生植物的吸收作用.

关键词: 灰色关联度 过氧化物酶 过氧化氢酶 可溶性蛋白 叶片叶绿素含量 灰色关联度 过氧化物酶 过氧化氢酶 可溶性蛋白 叶片叶绿素含量

Abstract: The grey relational analysis was initiated to investigate the relationships between the physiological properties of aquatic plants and the performances of the bio-eco-technology for the treatment of malodorous rivers in Shanghai. The main objective of this research was to provide scientific explanation for the water purification mechanisms of the bio-eco-technology. The results indicated that the priority response order of the plants physiological properties for COD and NH₄⁺-N removal was POD>CAT>Chla>SP>Chlb, indicating that the microbial degradation could be mainly responsible for the removal of COD and NH₄⁺-N. However, the priority associated grade of the plant physiological characteristic for TP removal was Chlb>SP>Chla>CAT>POD, demonstrating that the adsorption of aquatic plants played a dominant role in removing total phosphorus from malodorous black water.

Key words: POD CAT SP Chl grey correlation POD CAT SP Chl

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