

不同品种浮萍磷素吸收动力学特征

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Phosphorus Uptake Kinetics of Different Types of Duckweed

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摘要

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摘要 以长江三角洲地区常见的3种浮萍——稀脉浮萍 (*Lemna aequinoctialis*)、少根紫萍 (*Spirodela oligorrhiza*) 和紫萍 (*Spirodela polyrrhiza*) 为对象, 研究不同品种浮萍对 HPO_4^{2-} 的吸收动力学影响。结果表明, 3种浮萍对无机磷的吸收动力学特征基本可采用Michaelis-Menten 方程描述, 3种浮萍无机磷吸收速率 V 对磷浓度 S 双倒数曲线的拟合关系均在 $a=0.01$ 水平上显著。稀脉浮萍对无机磷的亲和力较强, 适宜应用于对低磷浓度污水的净化; 紫萍对无机磷的最大吸收速度 V_{\max} 较高, 适宜应用于对高磷浓度污水的净化。

关键词: 浮萍 磷污水 HPO_4^{2-} 吸收动力学

Abstract: An increasing attention has been paid to the use of duckweed in treating eutrophicated water as a tool of bio-remediation of domestic wastewater. Phosphorus uptake kinetics was studied, of different species of duckweeds, i.e. *Lemna aequinoctialis*, *Spirodela oligorrhiza*, and *Spirodela polyrrhiza*, which are common in the Yangtze River Delta area. Results show that the phosphorus uptake kinetics of the duckweeds could be expressed with the Michaelis-Menten equation; and the relation between phosphorus uptake rate (V) of the duckweeds and inorganic phosphorus (Pi) concentration (S), was well fitted with a double-reciprocal curve with $a=0.01$; the K_m value for Pi uptake of *Lemna aequinoctialis* was lower than that of *Spirodela oligorrhiza* and *Spirodela polyrrhiza*, making it a better candidate for treating wastewater low in Pi concentration. The maximum phosphorus uptake rate of *Spirodela polyrrhiza* was higher than that of the other two species, which allows *Spirodela polyrrhiza* better performance in purifying wastewater higher in Pi concentration.

Keywords: Duckweed phosphorus-containing wastewater HPO_4^{2-} uptake kinetics

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