

太湖地区典型水稻土FDA水解酶活性的剖面分布特征

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The profile distribution of FDA hydrolysis in paddy soils in Taihu region

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摘要 本文主要对太湖地区12个典型水稻土剖面的荧光素二乙酸酯(FDA)水解酶活性及其它相关酶活性进行了分析。耕作层的FDA水解酶活性最高,随土层加深活性明显下降,其中部分土壤在犁底层已经很难检测到其活性。部分样点的酶活性在剖面中呈明显的梯度下降趋势。高产水稻土壤表层FDA水解酶活性差异较大,在50~100 $\mu\text{g}/(\text{g}\cdot\text{h})$ 范围内,多数为60~80 $\mu\text{g}/(\text{g}\cdot\text{h})$ 。土壤酶活性最高与最低间的差异达到近一倍左右。同时FDA水解酶活性与 β -葡萄糖苷酶、脲酶、脱氢酶、酸性磷酸酶和芳基硫酸酯酶活性之间有极显著正相关关系($P<0.01$),与碱性磷酸酶呈显著相关($P<0.05$);与土壤养分指标如全氮、全磷、速效氮、有机碳之间有极显著相关性,与土壤pH呈显著负相关($P<0.01$)关系。

关键词: FDA 水稻土 酶活性 剖面分布 FDA 水稻土 酶活性 剖面分布

Abstract: The activities of fluorescein diacetate(FDA) hydrolysis and soil enzymes of 12 high fertility paddy soils located in Taihu region were analyzed in this paper. The activity of FDA hydrolysis in plowing layer was the highest and it decreased with soil depth. The activities of FDA hydrolysis were hardly detected in plowpan layer for some sampling soils. The enzyme activities of some soil sample sites shown apparently gradient decline. No any enzyme activity was detected at soil depth over 60 cm for all soils. There was significant difference of FDA hydrolysis activity among 12 soils. It ranged 50—100 $\mu\text{g}/(\text{g}\cdot\text{h})$ fluorescein with most concentrated into 60—80 $\mu\text{g}/(\text{g}\cdot\text{h})$ fluorescein. There was a highly significant correlation between the activity of FDA hydrolysis and the activities of acid phosphatase, urease, β -glucosidase, dehydrogenase and arylsulfatase ($P<0.01$) and a significant correlation with alkaline phosphatase ($P<0.05$). The activity of FDA hydrolysis was positive correlation with the content of total N, total P, available N, available P and organic C in soils ($P<0.01$) and a significant negative correlation with soil pH value.

Keywords:

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