

研究报告

汞对土壤酶活性的影响

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收稿日期 2006-2-23 修回日期 2007-1-7 网络版发布日期 接受日期

摘要 利用室内模拟方法, 研究了重金属Hg对不同土样脲酶、转化酶和中性磷酸酶活性的影响. 结果表明, Hg可显著地抑制土壤脲酶和转化酶的活性, 但不同土样Hg对两种酶活性的抑制程度有很大差别. HgCl₂浓度与两种酶活性之间的关系均可用对数方程很好地描述 ($P < 0.05$). 4个土样的脲酶ED₅₀ (生态剂量) 分别为87.99、5.47、24.05和19.88 mg · kg⁻¹; 转化酶的ED₅₀ 分别为76.68、727.49、236.52和316.59 mg · kg⁻¹. 脲酶对Hg污染比转化酶敏感; 有机质对土壤酶活性有一定的保护作用. 除连续2年施用大量有机肥的草甸棕壤土样中Hg对中性磷酸酶有显著的激活作用外 ($P < 0.05$), 其它土样无显著变化, 表明中性磷酸酶活性对Hg污染反应不敏感.

关键词 [汞](#) [土壤](#) [脲酶](#) [转化酶](#) [中性磷酸酶](#)

分类号

Effects of Hg on soil enzyme activity

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Abstract

With simulation test, this paper studied the effects of Hg on the activities of urease, invertase and neutral phosphatase in four soils. The results showed that Hg inhibited soil urease and invertase activities markedly, but its inhibitory effect differed with test soils. There was a significant logarithmic correlation between the concentration of HgCl₂ and the activities of these two enzymes ($P < 0.05$). In test soils, the ED₅₀ of urease activity was 87.99, 5.47, 24.05 and 19.88 mg · kg⁻¹, and that of invertase activity was 76.68, 727.49, 236.52 and 316.59 mg · kg⁻¹, respectively. Urease was more sensitive than invertase to Hg contamination, while organic matter had a protective effect on soil enzymes. Soil neutral phosphatase was not sensitive to Hg contamination, except that it was significantly activated by Hg in the meadow brown soil applied with plenty of organic fertilizer.

Key words [Hg](#) [soil](#) [urease](#) [invertase](#) [neutral phosphatase](#)

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