

山东棕壤重金属污染土壤酶活性的预警研究

张桂山¹;贾小明¹;马晓航¹;钱忠¹;史春余²;张夫道²

1.浙江大学生命科学学院 浙江杭州310029;2.中国农业科学院土壤肥料研究所 北京100081

The warning research of soil enzyme activities on heavy metal-contamination of brown earth in Shandong

ZHANG Gui-shan¹;JIA Xiao-ming¹;MA Xiao-hang¹;QIAN Zhong¹;SHI Chun-yu²;ZHANG Fu-dao^{2*}

1 College of Life Sci.; Zhejiang Univ.; Hangzhou 310029; China; 2 Inst. of Soil and Fertilizer; CAAS; Beijing 100081; China

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摘要 本文研究了重金属 Cu^{2+} 、 Cr^{3+} 、 Pb^{2+} 污染对山东棕壤土壤过氧化氢酶、脲酶、磷酸酶、蔗糖酶活性的效应;提出了山东棕壤重金属 Cu^{2+} 、 Cr^{3+} 、 Pb^{2+} 污染,土壤酶的预警指标和预警阈值。结果表明,在本试验条件下, Cu^{2+} 污染可以过氧化氢酶为预警指标,由相应的回归方程计算出国家土壤环境质量标准 Cu^{2+} 的临界浓度的预警阈值:一级土壤为9.36%,二级土壤为11.57%; Cr^{3+} 污染可以脲酶为预警指标,其预警阈值:一级土壤为11.94%,二级土壤为15.12%; Pb^{2+} 污染可以蔗糖酶为预警指标,其预警阈值:一级土壤为1.50%,二级土壤为3.42%。

关键词: 重金属 土壤酶 棕壤 预警指标 预警阈值 重金属 土壤酶 棕壤 预警指标 预警阈值

Abstract: In this paper, the influence of heavy metals Cu^{2+} ($\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$), Cr^{3+} [$\text{Cr}_2(\text{SO}_4)_2 \cdot 6\text{H}_2\text{O}$], Pb^{2+} [$\text{Pb}(\text{CH}_3\text{COO})_2 \cdot 3\text{H}_2\text{O}$] on the activities of catalase, urease, phosphatase, sucrase of brown soil in Shandong were studied. According to the results of the experiments, put forward warning index and the threshold value of warning of soil enzyme for heavy metals Cu^{2+} , Cr^{3+} , Pb^{2+} pollution of Shandong brown soil. Under the conditions of the study, the pollution of Cu^{2+} could take catalase as warning index, according to corresponding regression equation, work out the threshold value of warning of Cu^{2+} critical concentration in environmental quality standard value for soils, first-class soil was 9.36% and the second was 11.57%; the pollution of Cr^{3+} could take urease as warning index, the threshold value of warning of first-class soil was 11.94%, that of second-class soil was 15.12%; the pollution of Pb^{2+} could take sucrase as warning index, the threshold value of warning of first-class soil was 1.50%, and the second-class soil was 3.42%.

Keywords:

引用本文:

张桂山¹;贾小明¹;马晓航¹;钱忠¹;史春余²;张夫道².山东棕壤重金属污染土壤酶活性的预警研究[J] 植物营养与肥科学报, 2004,V10(3): 272-ZHANG Gui-shan¹;JIA Xiao-ming¹;MA Xiao-hang¹;QIAN Zhong¹;SHI Chun-yu²;ZHANG Fu-dao².The warning research of soil enzyme activities on heavy metal-contamination of brown earth in Shandong[J] Acta Metallurgica Sinica, 2004,V10(3): 272-

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