陈碧华,杨和连,周俊国,任秀娟,马杰,孙丽,李新峥.大棚菜田种植年限对土壤重金属含量及酶活性的影响[J].农业工程学报,2012,28(1):213-218

大棚菜田种植年限对土壤重金属含量及酶活性的影响

Effect of cultivating years of vegetable field on soil heavy metal content and enzyme activity in plastic shed

投稿时间： 2011-05-09 最后修改时间： 2011-11-02

中文关键词：重金属,污染,土壤,酶活性,大棚,种植年限

英文关键词:heavy metals pollution soils enzyme activity greenhouses cultivating years

基金项目:河南省重大科技攻关项目（092101310300）；河南省重点科技攻关项目（112102310378）资助

作者	单位
陈碧华	河南科技学院园艺园林学院，新乡 453003
杨和连	河南科技学院园艺园林学院，新乡 453003
周俊国	河南科技学院园艺园林学院，新乡 453003
任秀娟	河南科技学院园艺园林学院，新乡 453003
马杰	河南科技学院园艺园林学院，新乡 453003
孙丽	河南科技学院园艺园林学院，新乡 453003
李新峥	河南科技学院园艺园林学院，新乡 453003

中文摘要:

为了探讨大棚种植年限对大棚菜田土壤重金属累积、土壤酶活性的影响以及二者的关系，采集不同种植年限（0、5、10、15、20、25、30?a）大棚菜田土壤样品共140份，测定土壤样品中重金属的含量以及土壤酶活性。结果表明：大棚菜田土壤中重金属Zn、Pb、Cu的含量和种植年限极显著相关；重金属Cd、Ni、Mn的含量和种植年限显著相关；重金属Cr的含量和种植年限不相关。大棚菜田土壤中过氧化物酶、多酚氧化酶、淀粉酶活性和种植年限极显著相关，磷酸酶、蔗糖酶活性和种植年限显著相关，过氧化氢酶、脲酶、蛋白酶活性和种植年限相关性不显著。随着种植年限的延长重金属Zn、Cu含量对多酚氧化酶、过氧化物酶活性有抑制作用，其敏感性顺序为：过氧化物酶对Zn敏感性＞多酚氧化酶对Zn敏感性＞过氧化物酶对Cu敏感性＞多酚氧化酶对Cu敏感性。土壤中过氧化物酶、多酚氧化酶可以作为重金属Zn污染的指示酶，过氧化物酶可以作为重金属Cu污染的指示酶。该文为设施污染土壤环境质量评价提供依据。

英文摘要:

In order to discuss effect of different cultivating years on soil heavy metal accumulation and enzyme activity in plastic shed vegetable field and the relationship between them, the 140 samples of soil were collected from plastic shed vegetable field of different cultivating years (0, 5, 10, 15, 20, 25, 30?a), and their heavy metal contents and enzyme activities were determined. The results showed that the contents of Zn, Pb and Cu were most significantly correlated with cultivating years respectively, the contents of Cd, Ni and Mn were significantly correlated with cultivating years respectively，the content of Cr was not correlated with cultivating years. The activities of soil peroxidase, polyphenol oxidase and amylase were most significantly correlated with cultivating years respectively, the activities of soil phosphatase and saccharase were significantly correlated with cultivating years respectively，the activities of soil catalase, urease and protease were not correlated with cultivating years respectively. With cultivating years increasing, the activities of soil polyphenol oxidase and peroxidase were inhibited the contents of Zn and Cu, the sensitivity order was sensitivity of peroxidase to Zn＞sensitivity of polyphenol oxidase to Zn＞sensitivity of peroxidase to Cu＞sensitivity of polyphenol oxidase to Cu. The soil peroxidase and polyphenol oxidase could be regarded as the indicator enzyme of Zn pollution, the soil peroxidase could be regarded as the indicator enzyme of Cu pollution. The study provides a foundation for soil environmental quality evaluation in polluted protected field.

查看全文 下载PDF阅读器

关闭