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新疆典型农业地区土壤中有机氯农药（OCPs）分布特征及风险评价

Distribution and risk assessment of organochlorine pesticides (OCPs) in soils of typical agricultural regions in Xinjiang

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中文关键词：农业土壤,农药,分布特征,风险评价,有机氯,新疆

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中文摘要:

为加强有机氯农药（organic chlorinated pesticides，OCPs）的污染预防与控制，该研究分析了新疆典型农业地区有机氯农药的污染状况并对其进行了风险评价。采集表层土壤样品36个，分析其中15种OCPs的残留状况。六六六（Hexachlorocyclohexanes，HCHs）、滴滴涕（dichlorodiphenyltrichloroethanes，DDTs）、氯丹类化合物、硫丹和硫丹盐的质量分数范围分别是0.37～22.82、0.91～858.47、0.15～47.08 ng/g、N.D（未检出）～16.27和N.D～73.83 ng/g。对OCPs的来源进行分析，发现HCHs 来源于历史上工业HCHs的使用或近期林丹的输入，DDT来源于工业品的违法使用和三氯杀螨醇的使用，研究区域氯丹存在新的来源，而硫丹新来源较少。通过主成分分析，从15种OCPs中提取了5个主成分，总方差解释量达到了79.93%。5个主成分分别归因于DDT和工业HCH s的使用、OCPs原料的差异以及研究区域内病虫害的发病特征等。利用灰色关联分析研究区域内OCPs污染状况，结果表明石河子污染水平最高，各研究区域土壤均需要采取进一步的污染控制措施。

英文摘要:

To enhance pollution prevention and control of organochlorine pesticides (OCPs)，the extent of organochlorine pesticides contamination in typical agricultural regions in Xinjiang was investigated in the paper. Surface soil samples from Xinjiang were collected and analyzed for obtaining the residual levels of 15 OCPs. The concentrations were in the ranges of 0.37-22.82 ng/g for HCHs, 0.91-858.47 ng/g for DDTs, 0.15-47.08 ng/g for chlordane-associated compounds, N.D (not detected) -16.27 ng/g for endosulfan and N.D-73.83 ng/g for endosulfan sulfate. Analysis of the sources of contamination showed that HCHs in the area were derived from an old mixed source of technical HCHs and lindane. DDTs, which were suspected to have recent application to the soil in most sites, were derived mainly form a mixture of technical DDTs and dicofol containing DDT impurites, and that chlordanes have new input while endosulfan have few new resources. Five principal components were extracted from 15 components by principal component analysis, accounting for 79.93% of the 15 OCPs tested suggesting that the occurrence of pests and diseases, the application of different OCPs and the components of the pesticides, were all reflected by the messages contained in the principal components. The gray correlative analysis assessment was used to evaluate pollution level of OCPs, the results showed that the pollution level of Shihezi was the highest, and that further measures of pollution control should be taken in all regions.

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