环境科学学报
ACTA SCIENTIAE CIRCUMSTANTIAE

研究论文

王雁,何伟,秦宁,何玘霜,孔祥臻,欧阳慧灵,徐福留.巢湖表层沉积物中有机氯农药的残留与风险[J].环境科学学报,2012,32(2):308-316

巢湖表层沉积物中有机氯农药的残留与风险

Residual levels and ecological risks of organochlorine pesticides in surface sediments from Lake Chaohu

关键词：巢湖 表层沉积物 有机氯农药 生态风险

基金项目：国家水专项(No. 2008ZX07103-005-01);国家杰出青年基金项目(No.40725004);国家自然科学基金重点项目(No.41030529);国家环境保护公益性行业科研专项(No. 20100932);国家教育部博士点专项基金项目(No. 20100001110035)

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摘要：利用GC-MS分析了巢湖14个样点表层沉积物中有机氯农药(OCPs)残留水平,研究了其分布与组成特征、与TOC的关系以及生态风险.结果表明:巢湖表层沉积物中OCPs总含量范围为0.58~32.91 ng·g^{-1}(干重),其中六六六类(HCHs)农药含量在0.23~1.81 ng·g^{-1}之间,滴滴涕类农药(DDTs)含量在0.34~31.01 ng·g^{-1}之间.表层沉积物中HCHs和DDTs平均含量的空间分布特点为:西部湖心>东部水源区>东部湖区(不包括水源区)>河流,狄氏剂和异狄氏剂则主要为巢湖东部湖区和水源区的局部污染.HCHs和DDTs的组成成分分析表明其主要来源于历史残留.OCPs含量与TOC含量之间不存在显著相关关系,说明OCPs在沉积物中的含量还受到其他因素的影响.与共识沉积物质量基准(CB-SQG)相比较,巢湖局部地区表层沉积物存在较大生态风险.

Abstract: The contents of organochlorine pesticides (OCPs) in surface sediments from 14 sampling sites in Lake Chaohu were measured by GC-MS. The distributions, compositions, relationships with TOC and potential ecological risks of OCPs were analyzed. The results showed that the total concentrations of 12 detectable OCPs in the surface sediments of Lake Chaohu ranged 0.58~32.91 ng·g^{-1}(dry weight), within which the concentration ranges of HCHs and DDTs were 0.23~1.81 and 0.34~31.01 ng·g^{-1}, respectively. The highest residual levels of HCHs and DDTs were found in the centre of western lake area, followed by the eastern water source area, the eastern part of the lake (water source district excluded), and the eastern inflow rivers. Dieldrin and endrin were mainly distributed in the eastern part of the lake. The correlation between OCPs contents and TOC contents in sediments was not significant, indicating that the content of OCPs in the sediments was also affected by other factors. HCHs and DDTs in the sediments of Lake Chaohu were originated mainly from their historical usage, as indicated by their composition characteristics. Compared to the consensus-based sediment quality guidelines (CB-SQGs) for freshwater ecosystem, OCPs in the surface sediments from some areas of Lake Chaohu posed big ecological risks to benthic organisms.

Key words: Lake Chaohu surface sediments organochlorine pesticides ecological risks

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