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沙蚕生物扰动对河口沉积物中菲释放的影响

Influence of *Nereis diversicolor* bioturbation on release of phenanthrene from a field estuarine sediment关键词: [生物扰动](#) [沙蚕](#) [沉积物](#) [菲](#) [释放](#) [形态](#)基金项目: [中国博士后基金项目 \(No. 2011M500512\)](#)

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摘要: 生物扰动是一个重要沉积物-水界面过程, 影响沉积物中污染物的归趋. 为了探究生物扰动对沉积物中多环芳烃释放的影响. 在室内进行30 d的沙蚕生物扰动对河口沉积物中菲释放的影响实验. 结果表明, 相对于对照, 生物扰动提高水体中颗粒态菲达到2.96~10.35倍, 溶解态菲为9.55~17.44倍. 由此可见, 沙蚕的生物扰动极大的促进了沉积物中菲向水体释放. 在生物扰动处理中, 两种形态的菲所占比例不同, 其中溶解态菲占释放总量的80%以上, 表明沙蚕的生物扰动主要是提高水体中溶解态菲. 由于溶解态菲能被生物所利用, 通过食物链威胁人类健康. 因此, 沙蚕生物扰动造成的沉积物中的污染物释放具有潜在的生态风险.

Abstract: Bioturbation is an important process at the sediment-water interface, which has significant effects on the fate of contaminants in the sediment. In the present study, the impact of the *Nereis diversicolor* bioturbation on the release of phenanthrene from a field contaminated estuarine sediment were studied in a 30-day laboratory microcosm experiment. The results showed that releases of both the dissolved and particle-associated phenanthrene from sediment to water were enhanced by *N. diversicolor* bioturbation. Compared to nonbioturbation, the particulate and dissolved phenanthrene were enhanced in the presence of the *N. diversicolor* by 2.96~10.35 and 9.55~17.44 times, respectively. The bioturbation can enhance phenanthrene in the sediment particle desorption to water, which apparently increase the concentration of the dissolved phenanthrene in the water. In this study, the dissolved phenanthrene accounted for more than 80% of the total of phenanthrene released by *N. diversicolor* bioturbation. This indicated that *N. diversicolor* bioturbation mainly enhanced release of the dissolved phenanthrene. It is well known that the dissolved phenanthrene might be uptaken by aquatic organisms, posing potential risks to aquatic organisms and even wildlife and humans that consume aquatic organisms. This study indicates that enhancement of the release of contaminants from sediment by *N. diversicolor* bioturbation has ecological risk.

Key words: [bioturbation](#) [Nereis diversicolor](#) [sediment](#) [phenanthrene](#) [release](#) [form](#)

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