

综述

有机磷农药长期低剂量暴露致认知功能损伤的研究进展

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摘要 有机磷农药在世界范围内大量使用, 其残留农药势必对环境造成持续污染, 这种长期、低剂量的有机磷暴露对人类健康的威胁已经引起广泛关注。有机磷致神经毒性主要与胆碱酯酶抑制有关, 而流行病学调查显示, 环境有机磷暴露人群胆碱酯酶没有明显抑制, 但中枢神经系统出现学习记忆等认知功能损伤, 其作用机制尚不明确。学习记忆功能的改变不仅受到突触可塑性和乙酰胆碱等神经递质的影响, 也与学习记忆相关信号系统的激活, 神经细胞骨架的降解以及神经发生等密切相关, 随着非胆碱作用机制在有机磷致神经毒性中发挥越来越重要的作用, 本文就有长期低剂量有机磷农药暴露致认知功能损伤的表现及其可能作用机制的新进展进行简要概述。

关键词 [有机磷农药](#) [神经行为学表现](#) [环境暴露](#)

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Progress in cognitive impairment induced by low-dose exposure to organophosphate pesticides

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Abstract

Organophosphate insecticides (OPs) are the most widely used group of pesticides in the world. The worldwide use of OPs continues to produce detectable levels of OPs in the environment, thereby posing an ongoing risk for human health, which has gained greater attention. The main mechanism of OPs caused neurotoxicity is the inhibition of AChE, while epidemiological studies reported cognitive (memory, learning, *et al*) impairment without AChE inhibition after environmental exposures. The mechanism of chronic low-level OPs exposure caused memory impairment is not clear. The alteration of learning and memory function is not only regulated by the changes in synaptic plasticity and neurotransmitters, but also adjusted by the related signal pathways, the cytoskeleton degradation and the neurogenesis of neurons. With the development of noncholinergic mechanisms, the present paper focuses on the syndromes and the recent research progress in cognitive impairment induced by low-dose exposures to OPs.

Key words [organophosphate pesticides](#) [cognitive manifestation](#) [environmental exposure](#)

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