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Pyrethroid pesticide residues in the global environment: An overview

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Abstract

Pyrethroids are synthetic organic insecticides with low mammalian toxicity that are widely used in both rural and urban areas worldwide. After entering the natural environment, pyrethroids circulate among the three phases of solid, liquid, and gas and enter organisms through food chains, resulting in substantial health risks. This review summarized the available studies on pyrethroid residues since 1986 in different media at the global scale and indicated that pyrethroids have been widely detected in a range of environments (including soils, water, sediments, and indoors) and in organisms. The concentrations and detection rates of agricultural pyrethroids, which always contain α -cyanogroup (α -CN), such as cypermethrin and fenvalerate, decline in the order of crops > sediments > soils > water. Urban pyrethroids (not contain α -CN), such as permethrin, have been detected at high levels in the indoor environment, and 3-phenoxybenzoic acid, a common pyrethroid metabolite in human urine, is frequently detected in the human body. Pyrethroid pesticides accumulate in sediments, which are a source of pyrethroid residues in aquatic products.

Keywords: Pyrethroids; Residue distributions; Transport pathways; Ecological risks

Highlight: Pyrethroid pesticides have been widely detected at the global scale.

Sediment samples from developed regions revealed high levels of pyrethroids.

Pesticide residues in residential environments and the human body should be

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