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生薬中に含まれる有機リン系農薬の漢方処方煎液への移行

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Migration of Organophosphorus Pesticides to Decoctions of Kampo Formula from Crude Drugs

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Summary

During our studies on quality evaluation of crude drugs in Japan, we have detected organophosphorus pesticides in several crude drugs. In Japan, about 90% of crude drugs are used as raw materials for Kampo products after industrial decoction followed by a spray-drying process. To assess human exposure, it is important to determine the fate of the pesticides during the extraction step. In this study, we prepared 3 Kampo decoctions from crude drugs contaminated with organophosphorus pesticides and quantitatively determined residual pesticide concentrations in the decoctions and the crude drug residues.

The maximum migration rate to the decoctions was 31% in the case of malathion in Citrus Unshiu Peel in Hochuekkito. The migration rates of the other pesticides, except malathion, parathion and parathion-methyl, were less than 20%. It is concluded that considerable amounts of these pesticides may remain in the crude drug residues or be lost by decomposition or vaporization during the decoction process. The amounts of organophosphorus pesticides, except tolclophos-methyl, in crude drug residues of Hochuekkito were related to log Kow, not to water solubility.

Key words

Decoction, Kamishoyosan, Hochuekkito, Hangekobokuto, Organophosphorus pesticide, Fenitrothion, Malathion, Methidathion, Parathion, Parathion-methyl, Phenthoate, Quinalphos, GC-FPD