

The Study of Potential Interaction of Co-exposure to Suspected Endocrine Disrupting Pesticides

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Iprodione (Ipr) and fenvalerate (Fen) are two common potential endocrine disrupting pesticides, which may be used concurrently to increase crop yield. However, potential synergistic interaction among mixed pesticide exposure could cause unexpected adverse effects on human health. In this study, we examined the pharmacokinetic interaction of Ipr and Fen by analyzing the pesticide concentrations in serum and urine of rats after single exposure or co-exposure to Ipr and Fen. SD rats were orally administered Ipr (35 mg/kg), Fen (10 mg/kg), or binary mixture of Ipr and Fen. The serum samples were collected at 3, 8, 12, 24, 48, and 96 h post-dose and the urine samples were collected at 24, 48, 72, 96, and 120 h. The concentrations of Ipr and Fen in serum and urine samples were determined by isotope labeling LC-ESI-MS/MS. Results showed that the elimination half-lives of Ipr in serum of rats after single exposure or co-exposure were 11.58 ± 4.17 and 9.39 ± 4.63 h, respectively, and the elimination half-lives of Fen in serum were 19.96 ± 6.84 and 17.79 ± 6.34 h, respectively. No significant differences in the estimated pharmacokinetic parameters were observed between single exposure and co-exposure groups except for the maximum serum concentrations of Ipr. Ipr and Fen did not alter the overall pharmacokinetics of each other in serum. There were no obvious pharmacokinetic interaction between Ipr and Fen, suggesting that the entire response could be additive. These results provided insight into the risk assessment associated with occupational or environmental co-exposures to these pesticides.