The Selection of Environmental Contaminated Pesticides and Suggestion of Drinking Water Guidelines by Chemical Ranking and Scoring System

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In this research, it was investigated to the resonable way for select the environmental hazardous pesticides. For this purpose it was compared four methods of Chemical Ranking and Scoring (CRS) system in this study. To know the movement of the pesticides, the Ground water Ubiquity Score (GUS) which calculated soil absorption coefficient (Koc) and half lives in soil was looked over. Also to predict exposure amount of pesticide, the DRANC method and TSCA method were used. Those methods were calculated from basic parameters such as water solubility, Kow, and pesticide application amounts. Finally, the EEC method that indicated possibility of contamination to ecosystem was considered. Especially, for the adaption of those models to Korean environment, the annual consumption amounts of pesticides has been calculated by a.i. basis since 1972 using "the Yearbook of Pesticides" While, those methods were not shown as complicated coverage of environmental hazards, so some factors and equations of those methods were rearranged and estimated to the Environment Exposure value (EEX), finally. This EEX should be included almost of detected pesticides in Korean aquatic environment. Using this EEX the environmental contaminated pesticides were selected considering with some toxicity value such as ADI, NOEL, and LC_{50}.

The selected pesticides were diazinon, chlorpyrifos, fenitrothion, endosulfan, pirimiphos-methyl, carbofuran, triflumizole, bitertanol, pencycuron, butachlor, molinate, isoprothiolane which were highly ranked possibility of exposure and toxicity, and then carbosulfan, pendimethalin, tricyclazole, iprobenfos as possibility of exposure, and finally oxadiazon, cyfluthrin, trifluralin as possiblity of toxicity. At the same time, "the Drinking Water Guideline" about selected pesticides was evaluated; bitertanol 0.05 $mg \cdot kg^{-1}$, butachlor 0.05$mg \cdot kg^{-1}$, carbofuran 0.01$mg \cdot kg^{-1}$, carbosulfan 0.05$mg \cdot kg^{-1}$, chlorpyrifos 0.05$mg \cdot kg^{-1}$, cyfluthrin 0.1$mg \cdot kg^{-1}$, diazinon 0.01$mg \cdot kg^{-1}$, endosulfan 0.03$mg \cdot kg^{-1}$, EPN 0.005$mg \cdot kg^{-1}$, fenitrothion 0.01$mg \cdot kg^{-1}$, iprobenfos (IBP) 0.01mg/kg^{-1}, isoprothiolane 0.05$mg \cdot kg^{-1}$, molinate 0.01$mg \cdot kg^{-1}$, oxadiazon 0.01$mg \cdot kg^{-1}$, pencycuron 0.1$mg \cdot kg^{-1}$, tricyclazole 0.15$mg \cdot kg^{-1}$, triflumizole 0.1$mg \cdot kg^{-1}$, and trifluralin 0.1$mg \cdot kg^{-1}$, respectively.

Through the practical use of the results in this research, the more scientific selection of hazardous pesticides in environment could be performed in future. Also, the systematic guidelines in drinking water, irrigation water and lake or river must be established for reduction of environmental risks by pesticide residues.

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