ESTIMATES OF INSECTICIDE PERCENT DISTRIBUTION AMONG HUMAN TISSUES

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This research work aimed at estimating the insecticide distribution among human tissues and evaluating the degree of similarity among insecticides in relation to their tissue distribution and among tissues as to their insecticide distribution. Thirty nine insecticides were selected among those registered in Brazil for use in agriculture. The level I fugacity model was used for the calculations of insecticide distribution among tissues of muscles, viscera (brain, lung, etc), skin, lipid (fat, adipose), blood, liver, kidneys and gut (intestines). The physical-chemical characteristics of insecticides and the tissue lipid contents were used to calculate the insecticide distribution among tissues. Cluster analysis was performed to identify groups of insecticides with similar distribution within tissues and groups of tissues with similar distribution of insecticides. Ninety percent of the insecticides presented more than 50% distribution in lipid (fat) tissues. The cluster analysis pointed out three insecticide groups: in the first, 70 - 86% of insecticide accumulation was found in lipid tissues; in the second, 44 - 58%; and in the third, 9 - 19%. The octanol-water partition coefficient, the water solubility and the tissue lipid contents determined an insecticide distribution in human tissues. The level I fugacity model, the physical-chemical characteristics of insecticides, the tissue lipid contents and human tissue volumes may contribute in the selection of insecticides and tissues for sampling analysis in research studies and human health monitoring.