A review on pesticides occurrence in fruits and vegetables in Malaysia and their potential health risk among adults

ABSTRACT

This study was conducted to review the occurrence of pesticide residues in fruits and vegetables in Malaysia and to estimate the health risk upon their consumption among adults. Data from several multi residue analytical studies in Malaysia from 2007 to 2014 were collected and analyzed and the reference dose (RfD) of all the compounds were obtained from the European Union (EU) Pesticide Database. Types of pesticides studied were endosulphan, L-cyhalothrin, cyfluthrin, cypermethrin, deltamethrin, chlorpyrifos, diazinon, malathion, triazophos and quinalphos. Health risk assessments were calculated based on the routes of exposure of pesticides through ingestion and the non-carcinogenic health risk was measured by calculating the value of hazard quotient (HQ). Then, the hazard quotient was summed up to obtained the hazard index (HI) of the cumulative pesticides in each sample. Pesticide residues in fruits and vegetables were ranged from 2.2E-4 mg/kg to 2.7 mg/kg. However, the reported concentrations of pesticide residues were below the maximum residual limit (MRL) set by European Commission. 30% of the pesticide residues exceeded their EU-MRL and the calculated hazard quotient for all compounds in the fruits and vegetables shows no significant non-carcinogenic health risk to human.

Keyword: Health risk; Pesticides; Fruits and vegetables; Hazard quotient (HQ); Hazard index (HI); Reference dose (RfD)