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STUDY OF FOOD CONTAMINATION WITH PESTICIDE RESIDUES IN KALUBIA GOVERNORATE

BY

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B. Sc. Agric., Plant Protection, Aleppo Univ., 1991
M. Sc. Agric., Pesticides, Ain Shams Univ., 1997

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ABSTRACT

Gomaa Mohammad Al-Kurdi. Study of food contamination with pesticide residues in Kalubia governorate. Unpublished Doctor of Philosophy Dissertation, Ain Shams University, Faculty of Agriculture, Department of Plant Protection, Pesticides, Egypt, 2000.

Twenty-nine different pesticide residues were investigated in a variety of food samples collected from three different locations at Kalubia governorate during four periods in 1999-2000.

The obtained results showed that most of the analyzed food samples contained different residue levels of pesticides, according to food item, sampling location and the time during which the samples were examined. Organochlorine pesticides were the main contaminants of milk, meat and fish samples, while some samples contained traces of other pesticides. Fruit and vegetable crops were contaminated with organophosphorous, pyrethroid and organochlorine pesticides.

An experiment was conducted to estimate the influence of boiling process on stability of organochlorine pesticides in milk. The results indicate that the boiling process considerably reduced the organochlorine pesticide residues in milk.

The effect of some household processes in removal of pesticide residues from selected fruits and vegetables was studied. The obtained results showed that all treatments reduced the pesticides residues at considerable amounts, but soaking in 0.4 % of potassium permanganate solution and peeling removed more residues than other treatments.

On the other hand, laboratory bioassay experiments were carried out in Faculty of Agriculture, Ain Shams University, Egypt, to test the effectiveness of nine insecticides against the adults of three zooplankton genera, i.e., *Bosmina spp.*, *Mesocyclops spp.* and *Cypris spp.* The tested insecticides were methomyl, fenpropathrin, triazophos, esfenvalerate, chlorpyrifos, fenitrothion, profenofos, malathion and pirimiphos-

methyl. The data pertaining to LC_{50} values and relative toxicities of the examined insecticides revealed that, in general, *Mesocyclops spp.* was the most sensitive genus to the tested insecticides, whereas *Cypris spp.* was the least sensitive to the same insecticides.

The LC_{50} values of methomyl, fenpropathrin, chlorpyrifos, esfenvalerate, profenofos, fenitrothion, malathion and pirimiphos-methyl to *Cypris spp.*, *Bosmina spp.* and *Mesocyclops spp.* were compared with the values of MRL for selected vegetable and fruit crops. The genus *Mesocyclops spp.* was most sensitive to low insecticide concentrations so that it gave the best results, most of MRL values were higher than corresponding LC_{50} values for the tested insecticides. The results showed that *Mesocyclops spp.* is the most suitable zooplankton genus which may be used as a bioindicator for the contamination of vegetable and fruit crops with pesticide residues. The use of zooplankton genera especially *Mesocyclops spp.* in pesticide residue monitoring is considered low-cost and rapid bioassay method for testing contamination of agricultural products with pesticide residues. Although it is not as accurate as chemical testing, which must be used to confirm bioassay results, it gives results very quickly; so contaminated products could be isolated from the market before it was sold. Farmers also can use this method to confirm whether their products are safe to consumers.

Key words: Food contamination, Pesticide residues, Market basket survey, Milk, Meat, Fish, Fruits, Vegetables, Removal, Household processes, Zooplankton, *Bosmina spp.*, *Cypris spp.*, *Mesocyclops spp.*, Bioindicators, Bioassay, Response,

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