DETERMINATION OF PESTICIDE RESIDUES IN *BRASSICA* VEGETABLES

Ph.D. DISSERTATION

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Title : Determination of Pesticide Residues in *Brassica* vegetables

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Abstract : Pesticides are widely used in farming and in agriculture to prevent insects and other pests from destroying crops. The total pesticide use is over 4.5 billion pounds annually. The use of pesticide residue on produce is a topic that is constantly being raised, especially by today's more health conscious population. The declination of malathion pesticide and chlorpyrifos pesticide residue, applied according to the recommended dose to *brassica* vegetables, were studied. Application of malathion pesticide, chlorpyrifos pesticide, formulated as 50% emulsifiable concentrate (EC), were applied to mustard white (*Brassica alba*), mustard green (*Brassica rapa*), and kale (*Brassica oleracea*). Samples were collected with the control and treated plots at the specified intervals (0, 1, 3, 5, 7, 9) day for malathion pesticide residue and (0, 1, 3, 5, 7, 9, 11, 13) day for chlorpyrifos pesticide residue between the application and harvest. The physicochemical properties such as water, ash, fat, protein of *brassica* vegetables were determined. These samples were carried out by extraction, chromatographic separation. Qualitative and quantitative determination of residues from the samples were done by GLC equipped with flame photometric detector (FPD). The effect of malathion pesticide residue, chlorpyrifos pesticide residue on the mustard green (with and without watering) as a function of time was compared. It was found that the declination rate or the remaining of pesticide residues depend on the the moisture and fat content of the plant. The rate of malathion and chlorpyrifos pesticide breakdown in the plant were also determined by half-life.

Some of the pesticide residue in *brassica* vegetables from retail markets was also qualitatively and quantitatively determined by enzyme inhibition thin layer chromatography (EITLC) and GLC. It was found that 90.7% of vegetables samples analysed contained no detectable level of pesticide residue, 9.3% of samples gave results with the concentration of pesticide residues below the maximum residue limit (MRL).

Keywords : Pesticide , insecticide residues, malathion, chlorpyrifos, vegetables, half-life.