Analysis of Pesticide Residues in Fruits and Vegetables exported to the European Union and determining the effect of Chlorine Treatment on Diazinon Residues

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Presence of pesticide residues in agricultural commodities can cause acute and chronic toxicities on humans.The objective of this study was to develop a monitoring programme to regulate the pesticide usage of farmers and to determine the effect of chlorine treatment on diazinon residues of tomato and bean samples. Two surveys were conducted to identify the malpractices of the farmers and exporters who cultivate and process the commodities, which are exported to the EU. A total of 98 samples of fresh fruits and vegetables were analysed for the presence of 66 active ingredients of pesticides. The quick easy cheap effective rugged and safe multi-residue extraction method was followed, using gas chromatography mass spectrometry. There were no malpractices were identified at farmer level while three malpractices were identified at exporter level. Analytical results revealed that only 26% of the samples were positive for pesticide residues. Pesticide residues above the European Union Maximum Residue Limit (MRL) were detected in 65% of samples among the contaminated. Multiple residues (2-3) were present in 11% of contaminated samples. Eleven pesticides were detected, of which 7 were insecticides, **4** were fungicides and no weedicides. Mostly detected active ingredients were profenophos and etofenphox, both of which were insecticides and carbendezim, a fungicide. The chlorine treatment had a significant effect on reduction of Diazinon residues in tomato ($p = 0.024$) and bean ($p = 0.005$) samples. The results confirmed the presence of pesticide residues in fruits and vegetables exported to the EU. Chlorine treatment at 150 ppm dosage could effectively reduce the residues of diazinon in tomato and beans.

Keywords: Pesticides, Residues, Chlorine, Maximum Residue Limit, Pesticide Contamination