

**MONITORING OF PESTICIDE RESIDUES
AND HEAVY METALS IN FOOD AND THEIR
TOXIC EFFECT ON ALBINO RAT**

By

MOHAMED REDA ABDEL-AZIZ ESHMAWY

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Vice Dean of Graduate Studies

Name of Candidate: Mohamed Reda Abdel-Aziz Eshmawy

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Supervisors: Dr. Mohamed Abdelhady Kandil

Dr. Ibrahim Saleh Ahmed Abdallah

Dr. Mona Abdel Aziz Khorshed

Branch: Pesticides

Department: Economic Entomology and Pesticides

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ABSTRACT

The occurrence of pesticide residues and heavy metals in commonly produced horticultural products in Egypt raises health concerns for consumers. Thus, the objectives of this study were to determine pesticide residues and heavy metal levels in the most consumed and exported fruits and vegetables namely orange, pomegranate, potatoes, green beans, molokhia, strawberry and tomato collected from local markets in Giza, Egypt and to assess the potential human health risks. Samples were analyzed using QuEChERS method followed by Gas chromatography mass/mass spectrometry and Liquid chromatography - mass/mass spectrometry for pesticide residue analysis and by using Inductively Coupled Plasma – Optical Emission Spectrometry for determination of heavy metals. Data showed that out of total 70 analyzed samples, 11.4% were free from pesticide residues, 88.6% were contaminated and 33% of the contaminated samples exceeded the maximum residue limits (MRL's). The most frequently detected pesticides were chlorpyrifos and lambda cyhalothrin. Data on heavy metals showed that out of total 70 analyzed samples, 100% of samples were contaminated and 51.4% of the contaminated samples exceeded the maximum limits (ML's). The most contaminated metals were Fe, Mn and Zn. Risk assessment was performed for only violated pesticide residues and also the daily intakes of essential metals. Data showed that no apparent potential human risk to consumers was observed. Chlorpyrifos was the most frequent and violated pesticide, cadmium and lead were the most toxic detected metals, so subchronic toxicity was performed to assess the effect of these contaminants alone and in mixtures. Data showed that all treatments reduced body weight gain and organs ratio but this reduction was not significant except kidney ratio weights. All tested enzymes of liver and kidney functions showed significant increase, but, Acetylcholinestrace activity was affected due to the treatments. Total soluble protein decreased significantly in all treatments especially in mixture treatments, Histopathological studies were performed on liver and kidney for all treatments and data showed that cellular difference in the organs were observed.

Key words: Chlorpyrifos, Albino rat, MRL, Heavy metals, Pesticides residues.

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