

EFFECT OF HOUSEHOLD PROCESSING ON INSECTICIDE RESIDUES REDUCTION IN TWO TOMATO (*Solanum lycopersicum* L.) CULTIVARS MARKETED IN AKURE, ONDO STATE, NIGERIA

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Abstract

Due to the increasing food demand as well as pest infestation, the use of insecticides in agriculture is increasing. In low income countries, poor training among farmers combined with the use of multiple insecticides may result in high health risk for the consumers. In this study, the level of insecticide residue was assessed in two tomato (*Solanum lycopersicum* L.) cultivars (Roma and Roma VF) commonly consumed in Akure, Ondo State, Nigeria. The impact of processing by peeling, boiling, and blanching was also investigated. The insecticide in the tomato samples was extracted and cleaned using the Quick, Easy, Cheap, Efficient, Rugged and Safe (QuEChERS) European standard 15662 method for the analysis of pesticide residue in low-fat products. Aliquot from the cleaned sample was subjected to further analysis using Gas Chromatography coupled with Mass Spectrometer detector (GC-MS). The residue levels of pyrethroid detected in the unprocessed tomatoes were all above the European set Maximum Residue Limits (MRLs). In Roma tomato cultivar, the most effective processes for reducing pyrethroid residue includes peeling which reduced β-cypermethrin residue by 48.60%, blanching reduced α-cypermethrin by 100%, and boiling which reduced cyfluthrin residue by 100%. In Roma VF tomato cultivar, all the processes were effective in completely removing α-cypermethrin, boiling and blanching reduced β-cypermethrin residue by 100%, while peeling was the most effective process to reduce cyfluthrin residue by 100%. Roma VF tomato cultivar retained lesser pyrethroid residue than Roma tomato cultivar. Blanching (85-87°C for 4 minutes) and boiling (100°C for 10 minutes) could reduce pyrethroid residues in the studied cultivars. Malathion and parathion insecticide residue in unprocessed tomatoes were below detectable levels until after boiling for 10 minutes before

parathion residues of 1.55 and 1.28 ppm was detected in Roma VF and Roma tomato cultivars respectively, while malathion residue of 1.89 ppm was the only organophosphate insecticide detected in Roma tomato cultivar. As much as persisting residues are inevitable, household processes could be effective tools for reducing and removing pyrethroid residues in these tomato cultivars.

Keywords: Tomatoes; pyrethroid; organophosphate; processing; cultivars

Biography

AROWOLO, Olatunbosun Kayode is an early career researcher who is currently preparing to start is PhD. He graduated with a FIRST CLASS in his undergrad in Environmental Management and Toxicology (major in Toxicology) at the Federal University of Agriculture, Abeokuta. In addition to his positive academic stride he bagged a DISTINCTION in his master's programme in Environmental Biology and Public Health at the Federal University of Technology, Akure. He currently lecturers as an Assistant Lecturer/ Researcher in the Environmental Management and Toxicology programme of Elizade University, Ondo State, Nigeria. Out of several other upcoming manuscript. He has published two articles and one conference proceedings.