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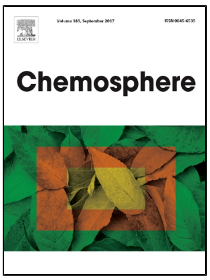

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Pesticide residues in raw and processed maize grains and flour from selected areas in Dar es Salaam and Ruvuma, Tanzania

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ABSTRACT

This study investigated the levels of pesticide residues in maize grains and flour and the effects of processing methods on their levels in maize products in samples collected in Dar es Salaam and Ruvuma regions. Analysis of cleaned-up extracts was done using gas chromatography-mass spectrometry (GC-MS). Twelve pesticides were detected in maize grains and their highest concentrations were up to 676.1, 11200 and 14 µg/kg for organochlorines, organophosphorous and pyrethroid pesticides, respectively. In maize flour, eight pesticides were detected and the concentrations for organochlorines, organophosphorous and pyrethroid pesticides were up to 333.3, 2220 and 2 µg/kg, respectively. Only dieldrin was detected in cooked samples at a concentration of 2 µg/kg. The concentrations of *p,p*'-DDD, aldrin, dieldrin, chlorpyrifos and pirimiphos methyl in some grains and flour samples exceeded the maximum residue limit (MRLs). The findings indicate risks and concerns for public health. Processing methods were found to cause transformation and reduction of the pesticides.

Keywords: Pesticides, Organochlorine, Organophosphorus, Pyrethroid, Maize, Tanzania

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1. Introduction

Cereal grains cover a large proportion of the human diet as raw or processed products. Among the cereals, maize production is higher than any other cereals produced in Tanzania. Maize is the main food crop grown in Tanzania. It is the major cereal crop consumed by people with varying food preferences and socio-economic background and is the most important staple