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Analysis of profenofos and diazinon residues in pineapple

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Pesticides are substances that kill or control unwanted organisms. Modern agriculture depends largely on pesticides for crop protection. Nevertheless, pesticides have caused severe problems. As pesticides cause harmful effects even at low concentrations, continuous monitoring of the levels of pesticides and their residues in crops is of great importance.

This study was carried out to determine the levels of profenofos and diazinon residues in the pineapple in Sri Lanka. These two insecticides are recommended by the Agricultural Department of Sri Lanka for the cultivation of pineapple and are widely used by farmers.

Fresh pineapples (n = 25) were collected from a wholesale market, a super market and fruit sale points in Colombo and Gampaha. A survey was also conducted during sample collection to obtain information such as origin of the fruit and the date of harvesting. The analytical method involved extraction of the samples by matrix solid phase dispersion (MSPD), where the pineapple samples were homogenized with the dispersant sorbent (silica gel) and eluted with ethyl acetate, followed by determination of the levels of profenofos and diazinon by GC/MS. Profenofos and diazinon were not within the limits of detection in any of the samples. MSPD has the advantage that the sample preparation, extraction, fractionation and purification are carried out in a single step. Therefore, it is less labour intensive, consumes lesser solvents and is more efficient than other technique. This method has been applied successfully in the analysis of pesticides in various fruits, vegetables, animal tissues, etc. Up to date there are no reports on the use of MSPD for pesticide residue analysis in fruits in Sri Lanka.

Prior to analyzing the samples, recovery studies were carried out by spiking pineapple samples with profenofos and diazinon at different concentration levels (0.01, 0.05 and 0.10 ppm) and carrying out the analysis. Average recoveries determined (three replicates) ranged from 94 to 101% and were in the satisfactory range of 80 - 120%. The percentage relative standard deviation (RSD%) of average recoveries ranged between 2 and 15%. Detection and quantification limits were 0.004 ppm and 0.01 ppm respectively for profenofos, and 0.001 ppm and 0.003 ppm for diazinon.

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