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Determination of Organophosphorus Pesticide Residues in Onion and Welsh Onion by Gas Chromatography with Pulsed Flame Photometric Detector

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A rapid gas chromatographic method for determining organophosphorus pesticide residues in allium such as onion and welsh onion containing high levels of sulfur-matrices was studied. A sample was extracted with acetonitrile and the acetonitrile layer separated by salting-out. The extract was cleaned up with gel permeation chromatography, and then with a tandem silica-gel/PSA mini-column. The test solution was subjected to gas chromatography with a pulsed flame photometric detector. Organophosphorus pesticide residues in such sulfur-rich matrices were determined without any serious interfering peaks on the chromatograms by diluting the extracts 8-fold (0.25 g/ml of sample). No additional pretreatment to deactivate enzymes which caused interference was necessary. The rate of recovery of 36 organophosphorus pesticides from fortified onion and welsh onion ranged from 61 to 105% with the RSD usually < 10% for five experiments. The detection limits of these pesticides were good (0.002-0.01 mg/kg) for monitoring organophosphorus pesticide residues in agricultural products including allium, except for degradable trichlorfon. The method was applied to onion and welsh onion to demonstrate its use in routine analysis.

Keywords:
organophosphorus pesticide residues, onion, welsh onion, sulfur-matrices, gas

chromatography, pulsed flame photometric detector

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