ANALYSIS OF SELECTED PESTICIDE RESIDUES IN VEGETABLES BY HPTLC

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In this paper, a HPTLC method for determination of residue levels of selected pesticides, which included 3 organophosphorus pesticides (Parathion, parathion-methyl and fenitrothion) and 4 carbamate pesticides (pirimicarb, methomyl, carbofuran and carbaryl) in vegetables (greengrocery, potato and wax gourd) was described.

The sample was extracted with a mixture of acetone-petroleum ether(4:3,v/v) for 3 organophosphorus pesticides, a mixture of petroleum ether-dichloromethane(v/v, 1:1) for 4 carbamate pesticides by ultrasonic wave for two times. The extract of each time was filtered, and incorporated concentrated in a condition of vacuum for analysis by HPTLC.

The prepared samples were applied as bands to the 10×20cm glass-backed silica gel 60F254 HPTLC plates previously prewashed by development with methanol by means of Linomat □ applicator(Camag, Muttenz, Switzerland), equipped with a 100-ul syringe. The plates were developed with toluene-dichloromethane (5:5,v/v) for 3 organophosphorus pesticides; tolulene-acetone(8:2,v/v) with migration distance of 45mm, then dichloromethane-toluene(8:2,v/v) with 80mm, and dichloromethane with 80mm for 4 carbamates in an unsaturated glass twin-trough Camag chamber. Evaluation of the developed HPTLC plates was performed densitometrically with a Camag TLC Scanner3 controlled by an external PC running WINCATS software (Versionm1.2.2). The results indicated that the lowest detection limits of parathion-methyl, pirimicarb, methomyl and carbofuran were 1.0×10^{-8}g, and carbaryl, parathion, fenitrothion were 2.0×10^{-9}g, 5.0×10^{-9}g and 2.0×10^{-8}g, respectively. Recovery rates from spiked vegetables with this analytical method ranged from 70.06% to 105.5%(fortification level, 0.05-5mg/kg). And the relative standard deviations (R.S.D.s) were from 1.59% to 27.94%, Which were generally fit for analysis of pesticide residues in vegetables.

Keywords: HPTLC, organophosphorus pesticides, carbamate pesticides, residue analysis, vegetable

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