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Determination of the Insecticide Azamethiphos in Water and Soil using High Performance Liquid Chromatography

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Abstract

Azamethiphos (AZA) is an organophosphorus insecticide used to control flies and cockroaches. Most of open dump sites in Sri Lanka AZA is applied as insecticide to control fly and studies on the occurrence of the insecticide in the environment after application was not recorded. Thus, the aim of this study was to optimise an analytical method to detect AZA in the environmental samples using High Performance Liquid Chromatography (HPLC). AZA in water samples were extracted using the Solid Phase Extraction (SPE) method following the methanol elute, rotary evaporation at 44.4^{o} C and the final residue was re-dissolved in 2.00 mL of HPLC grade Acetonitrile–water (20:80 v/v) for HPLC analysis. AZA residues in soil samples collected from dump site at Karadiyana was subjected to extract AZAinto Acetonitrile and then the solid phase extraction followingrotary evaporation andre-dissolved in 1.00 mL of acetonitrile-water (20:80, v/v) prior to analysis. Quantification of AZA was carried out using the HPLC system consisting of Agilent 1200 series. Two mobile phases were optimised for the isocratic run (Acetonitrile: water=70:30). About 25 µL sample was injected into at a flow rate of 1 mLmin^{-1}. Concentration of AZA were determined using the peak area (at 294 nm) of following the calibration curve and the detection limit for the method was 1 ppm. Soil and water recovery of the method were 94.65±0.13 µgL^{-1} and 94.02±0.09 µgL^{-1} respectively. Levels of AZA in collected water samples from dumping site area ranged from 895.35 µgL^{-1} to 924.81 µgL^{-1} and levels of AZA in soil samples ranged around 12,000 µgL^{-1}. Thus the optimise method is to be found more reliable and validate to detect and quantification of Azamethiphos in the environmental samples.

Keywords: Azamethiphos, High performance liquid chromatography (HPLC), Solid phase extraction (SPE), Environmental samples