서울 강남·강서 지역 유통 과일 중 잔류농약 470종 모니터링 및 위해성 평가

정보경, 김동규, 이춘영, 이윤정, 김미선, 최희진, 김민정, 유진경, 권하나, 홍미선, 윤은선, 박주성

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Monitoring and risk assessment of 470 pesticides in fruits distributed in Gangnam and Gangseo Districts, Seoul

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Abstract

This study aimed to monitor the residue levels of 470 pesticides in fruits distributed in Gangnam and Gangseo districts, Seoul, Korea. A total of 509 fruit samples were collected from January 2022 to June 2023. The samples were subjected to extraction using the quick, easy, cheap, effective, rugged, and safe (QuEChERS) method. Sample aliquots were analyzed using liquid chromatography–tandem mass spectrometry (LC-MS/MS) for 222 pesticides and gas chromatography–tandem mass spectrometry (GC-MS/MS) for 248 pesticides. Pesticide residues were detected in 47.7% of the samples with average 2.3 residues per sample. The most frequently detected pesticides were carbendazim (14.7%), etofenprox (8.4%), fludioxonil (7.5%) and dinotefuran (6.5%). All residues were below the maximum residue limits (MRLs) set by the Korea Food and Drug Administration (KFDA). To assess pesticide exposure risk from fruits, we compared the estimated daily intake (EDI) of each pesticide with its established acceptable daily intake (ADI) value. The hazard index, calculated as a percentage of ADI based on the average residue levels of detected pesticides in apple, mandarin, orange, grape, and peach samples, ranged from 0.00001% to 0.2611%. This indicates a low risk of dietary exposure to pesticides from these fruits.

Keywords: Pesticide, residue, exposure, risk, monitoring, MRL.