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Cho, Mi Sook

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Occurrence of patulin in various fruit juices from South Korea: An exposure assessment

Mi Sook Cho, Kyeongyeol Kim, Eunkyoung Seo, Neema Kassim, Adelard Barthalomew Mtenga, Won-Bo Shim, Soo-Hyung Lee & Duck-Hwa Chung

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Abstract

To determine patulin in various fruit juices, high performance liquid chromatography (HPLC) method was optimized and validated. For validation of HPLC method, a linearity, accuracy, precision, detection limit, and quantification limit were determined. Linearity (R2 = 0.99995), accuracy (96.1–115.7%), precision (3.31–9.52), detection limit (6 ng/mL), and quantification limit (8 ng/mL) were in agreement with performance criteria for patulin as set by the European Commission hence proved that HPLC can be used to detect patulin in fruit juices. After validation, the method was applied to estimate the prevalence of patulin in fruit juices (apple, grape, and orange juices). Nine samples (12.5%, 3 apple, 2 orange, and 4 grape juices) of 72 samples were positive for patulin in the range 2.8 to 30.9 ng/mL. According to the monitoring results, daily intake was estimated to be 0.17 ng/kg BW/day which was lower than the provisional maximum tolerable daily intake (0.4 μg/kg) established by Joint Expert Committee on Food Additives. These results indicate that the detection method coincides with the performance criteria and is appropriate for analysis of patulin, and continuous monitoring of patulin in various fruit juices from Korea is necessary.

Keywords

Patulin; mycotoxin; fruit juice; validation; exposure assessment