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Lead and Cadmium Residue Determination in Spices Available in Tripoli City Markets (Libya)

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Abstract : In recent years, there has been a growing interest in monitoring heavy metal contamination in food products. Spices can improve the taste of food and can also be a source of many bioactive compounds but can unfortunately, also be contaminated with dangerous materials, potentially heavy metals. This study was conducted to investigate lead (Pb) and cadmium (Cd) contamination in selected spices commonly consumed in Libya including Capsicum frutescens (chili pepper) Piper nigrum, (black pepper), Curcuma longa (turmeric), and mixed spices (HRARAT) which consist of a combination of: Alpinia officinarum, Zingiber officinale and Cinnamomum zeylanicum. Spices were analyzed by atomic absorption spectroscopy after digestion with nitric acid/hydrogen peroxide. The highest level of lead (Pb) was found in Curcuma longa and Capsicum frutescens in wholesale markets (1.05 ± 0.01 mg/kg, 0.96 ± 0.06 mg/kg). Cadmium (Cd) levels exceeded FAO/WHO permissible limit. Curcuma longa and Piper nigrum sold in retail markets had a high concentration of Cd (0.36 ± 0.09, 0.35 ± 0.07 mg/kg, respectively) followed by (0.32 ± 0.04 mg/kg) for Capsicum frutescens. Mixed spices purchased from wholesale markets also had high levels of Cd (0.31 ± 0.08 mg/kg). Curcuma longa and Capsicum frutescens may pose a food safety risk due to high levels of lead and cadmium. Cadmium levels exceeded FAO/WHO recommendations (0.2 ppm) for Piper nigrum, Curcuma longa, and mixed spices (HRARAT).

Keywords : heavy metals, lead, cadmium determination, spice
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