

HEAVY METAL AND RADIOACTIVE CONTAMINANTS IN SELECTED COSMETIC AND PERSONAL CARE PRODUCTS IN SRI LANKA

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Cosmetic and personal care products (PCPs) are highly utilized products among the general public. Since the demand for more efficient products has emerged over the last few decades, product manufacturers have experimented with different chemicals and production processes. Ultimately, end products contaminated with various toxic metals have created numerous adverse health impacts and environmental consequences. Therefore, this study examined the presence of toxic metals in selected cosmetics and PCPs in the Sri Lankan market. Based on the questionnaire survey, five categories of products: face wash (FW), facial scrubs (FS), baby creams (BC), shaving creams (SC), and skin creams (SK) were identified for the study. From each category, three samples from three highly utilized brands were taken (n=45). Each product (0.200 ± 0.001 g) was digested in 4 ml of Aqua Regia solution and injected into ICP-MS. The analyses revealed that toxic metals: Cr (0.15 – 1.67 mg kg⁻¹), Cd (0.04 -0.19 mg kg⁻¹), As (0.02 – 0.15 mg kg⁻¹), and Pb (0.06 – 2.86 mg kg⁻¹) were present in many products. Further, the highest levels of Cr, Cd, As and Pb were detected in SC1, SK3, SK1/SK3 and SC1 samples, respectively. However, these limits were within the maximum permissible levels specified by the local regulatory body. Alarmingly, Uranium-238, a radioactive element, was detected in four product categories (FS, BP, SC and FW) in a range of 0.01 – 0.04 mg kg⁻¹. Additionally, large amounts of Mn, Fe, Cu, Zn, and Ag were observed in many products. Bioconcentration and biomagnification of such elements in the environment could cause many unforeseen impacts in the future. Hence, regular monitoring of products must be a requirement in the production process, and the regulatory authorities should ensure all cosmetics and PCPs are healthy and environmentally friendly.

Keywords: Cosmetics, ICP-MS, Metals, PCPs, Radioactive elements