

## ABSTRACT

Now a days depilatory products have been extensively used because people prefer their skin to be smooth. In this regard, different depilatory products such as lotions, sprays and creams packed in jars, tubes, and sachets are mostly utilized. The present study aimed to examine the heavy metals (HMs) in different depilatory products from both local, national and international brands. Samples were pre-digested using nitric acid ( $\text{HNO}_3$ ) and hydrochloric acid ( $\text{HCl}$ ). HMs like lead (Pb), nickel (Ni), chromium (Cr), cadmium (Cd), cobalt (Co) and arsenic (As) were analyzed through atomic absorption spectroscopy (AAS). Results showed that the concentration of HMs in lotion, creams, and sprays ranging from Pb (0.04 - 0.32 mg/kg, 0.1 - 0.85 mg/kg, 0.008 - 0.19 mg/kg) and As (0.004 - 0.009 mg/kg, 0.003 - 0.012 mg/kg, 0.004 - 0.0006 mg/kg), however, Ni was detected only in lotion samples ranging from 0.11 - 0.23 mg/kg respectively with an order of  $\text{Pb} > \text{As} > \text{Ni}$ . Cd, Cr, and Co were all below detection limit (BDL) of 0.05 mg/kg. In short, lotions and jars are the most polluting formats for Pb. Lotions and tubes have greater levels of As contamination. Sprays show the lowest overall level of pollution. Compared to national and international items, local products have higher levels of Pb, As, and Ni contamination. In terms of carcinogenic and non-carcinogenic chronic daily intake (CDI) values were calculated to determine the hazard quotient (HQ). The HQ values for all metals are far below 1 and the cumulative HI of  $1.13 \times 10^{-6}$  confirms no significant non-carcinogenic risk from dermal exposure to these metals in the analyzed products. The lifetime cancer risk (LCR) values for Pb, As, and Ni are all well below the acceptable threshold of  $1 \times 10^{-6}$  indicating negligible cancer risk from long-term use of these products. The yeast growth was confirmed in some of the samples after drying using microbial analysis, which showed failure in the quality control aspect of production. Variability in formulations of products was also pointed out by observing that, there was no homogenization in the mixtures. In the case of any health risk, constant and stringent supervision toward conformity to the standards is mandatory. Regular monitoring of cosmetic products, particularly concerning heavy metal contamination, should be implemented to maintain human safety and security.