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Poster 60

Heavy metal profiles in teas and herbal infusions: a cross-country analysis

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Abstract

Background: Teas and herbal infusions (THIs) are valued for their health benefits but may contain heavy metal impurities, posing health risks due to bioaccumulation and toxicity [1]. Heavy metal contamination in THIs is linked to anthropogenic sources like pollution, soil contamination, irrigation, fertilizers, and food processing equipment [2]. With the rising consumption of THIs, monitoring heavy metal contamination is needed and has become a public health issue [3]. **Objective:** This study aimed to determine the concentrations of heavy metals in THIs available in Portuguese, Spanish, French, and Italian markets. **Methods:** THIs samples were purchased from different European countries: Portugal (n=23), Spain (n=11), France (n=9), and Italy (n=3). Infusions were prepared and analyzed using inductively coupled plasma mass spectrometry (ICP-MS) with an iCAP™ Q instrument. The heavy metals assessed included arsenic (As), cadmium (Cd), mercury (Hg), and lead (Pb). Statistical analysis was performed using JASP 0.19.3.0. **Results:** From the 46 samples analyzed, 43.5% were herbal infusions (HI), 41.3% tea, and 15.2% herbal mixtures with flavors (Mix). Tea samples had the highest levels of As (0.72 µg/L) and Pb (0.84 µg/L), while HI showed the highest Hg concentrations (0.04 µg/L), and Mix samples had the highest Cd levels (0.42 µg/L). The heavy metal profiles of THIs from Portugal and Spain were similar, following the order: As > Pb > Cd > Hg. In contrast, those from France and Italy followed the pattern: Pb > As > Cd > Hg. Among the analyzed samples, the French THIs had the highest Cd (0.36 µg/L) and Pb (0.81 µg/L) levels, while the Spanish samples contained the highest As concentration (0.88 µg/mL). Portuguese THIs exhibited the highest Hg levels (0.37 µg/L). Significant differences were observed in Hg and Pb concentrations between teas and infusions (p=0.044 and p<0.001, respectively). Additionally, Hg levels varied significantly between THI samples from Italy and Portugal (p=0.026). **Conclusions:** This study highlights the presence of heavy metals in THIs available in the Portuguese, Spanish, French, and Italian markets, with varying contamination profiles among countries. These findings raise concerns regarding food safety and emphasize the need for regulations and continuous monitoring to minimize heavy metal exposure through THI consumption.

Keywords: tea and herbal infusion; heavy metals; ICP-MS

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