ASSESSMENT OF SELECTED HEAVY METAL CONTENTS IN MEDICINAL PLANTS, TEA LEAVES AND CHOCOLATE USING ATOMIC ABSORPTION SPECTROMETRY

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ABSTRACT

Introduction: A rapid development of industry has brought many problems of environmental pollution in its wake. Also, the awareness of the role of trace elements for human health has largely been growing in recent years. Thus, in the present study, the content of Cd, Cu, Pb, Ni, Mo, and Zn in herbal plants, tea leaves and chocolate was determined. FAAS and ETAAS were used throughout the experiments.

Material and Methods: All samples (medicinal herbs, bovine liver, chocolate) were mineralised by the wet digestion method in a microwave oven (MLS 1200 MEGA, Italy) using a mixture of HClO$_4$ and HNO$_3$ (1:2 v/v). Analyses of elements were performed by ETAAS and FAAS techniques. Accuracy of measurements was tested with the CRM: CTA-OTL-1 Oriental Tobacco Leaves and NIST 1577a Bovine Liver.

Results and Discussion: The whole procedure, including sample preparation, dissolution, and measurements, was validated by using CRM, and the obtained recovery values fell within the ranges of 88–99%. In all samples, the ranges of Cd, Cu, Pb, Zn, Ni and Mo concentrations were 0.06–0.49; 0.85–17.78; 0.10–27.32; 3.08–145.19; 0.95–4.01; and 0.07–2.89 mg/kg, respectively.

Conclusions: The study showed essential differences in the metal levels between investigated grocery species, and indicated that the concentrations of all elements in the samples are comparable to the literature data. The results obtained for heavy metals in all samples were in good agreement with other data reported in the literature.

Key words: medicinal herbs, biological sample, chocolate, sample preparation, atomic absorption spectrometry (AAS), certified reference material (CRM)

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