Determination Of 17 Metals And Metalloids By Icp-Ms And Total Antioxidant Activity By Microwave-Assisted Extraction And Dpph Scavenging Method Of Salvia Fruticosa

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This work describes the development of an Inductively Coupled Plasma-Mass Spectrometry (ICP-MS) method for the determination of seventeen elements (V, Cr, Co, Se, Sr, Sn, Sb, Ba, Bi, Pb, Cd, As, Ni, Mn, Fe, Mg and Zn) in leaves, flowers and the infusion from Salvia Fruticosa, a sage cultivated in Crete’s island, Greece. The ICP-MS results were compared for some elements with the results obtained by Flame Atomic Absorption Spectrometry (Fe, Mg, Zn) and Electrothermal Atomic Absorption Spectrometry (V, Se, Pb, Cd, As, Ni, Mn). The elemental content was found to be in the range of 0.01-30.8 mg/Kg (leaves), 0.30-39.1 mg/Kg (flowers), 0.003-20.4 mg/Kg (infusion) for V, Cr, Co, Se, Sr, Sn, Sb, Ba, Bi, Pb, Cd, As, Ni, Mn and in the range of 0.07-3.21 g/kg (leaves) for Fe, Mg and Zn.

In addition, the antioxidant activity of the herbal was determined by measuring the DPPH scavenging activity. Microwave-assisted extraction (MAE) was used to extract total antioxidants. The effect of temperature, time and solvent in the extraction efficiency was investigated. The determination of the antioxidant activity was based on the calculation of the % inhibition of the absorbance signal of the radical DPPH at 515 nm, after the addition of herbal’s extract. Samples from other areas of Greece were also examined for comparison reasons. The EC_{50} values were found to be in the range of 10.6-32.2 mg/L.