High temperature as a tool for improving chemical properties and antioxidant capacity of Serbian *Satureja montana* L extract

Abstract

Satureja montana L. is a perennial medicinal plant. The plant material included in this study was harvested from a six-year-old plantation established at the experimental field of the Institute for Medicinal Plants Research “Dr Josif Pančić”. This study aimed to determine the influence of high temperatures (40, 60, and 80°C) on the chemical and antioxidant properties of the extracts obtained from air-dried plant material of S. montana, using 50% ethyl alcohol as an extraction agent. The chemical composition of the extracts was determined by assessing the total polyphenols (TPC), total flavonoids (TFC), total tannins (TTC), and total proteins present in the sample. On the other hand, ABTS and DPPH tests, alongside the reducing capacity assays (CUPRAC and FRAP) were used in order to determine the antioxidant potential of the extracts. The results show the highest TPC value when the employed temperature was 60°C, 33.4±0.4 mg gallic acid equivalent (GAE)/g of plant material, while the TFC merits ranged from 7.29±0.15 to 8.44±0.92 mg CE/g. The TTC was the highest in the extract obtained at 80oC, while the differences in total protein content were not statically significant. The DPPH IC50 was the same for all obtained extracts, while FRAP values were in accordance with the TPC, exhibiting the best reduction potential at the same temperature where the most polyphenolic compounds were extracted. Opposed to this, the highest ABTS●+ radical scavenging activity was found in the extract prepared at the highest examined temperature (80°C), while the best reducing capacity in the CUPRAC assay was measured for the temperature of 40°C. In order to produce extracts with the highest polyphenol content and antioxidant potential, which may be used in the food and pharmaceutical industries, this study demonstrates the first step in the extraction process optimization with regard to the employed temperature.