

## ANALIZA MIKRO I MAKRO ELEMENATA U UZORCIMA RUZMARINA ICP-OES METODOM

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**Sažetak.** Ruzmarin (*Rosmarinus officinalis*) je mediteranska biljka koja se koristi, ne samo kao ukras, već i kao začim, a ima i ljekovita svojstva. Ova biljka sadrži mnogo ljekovitih supstanci, kao što su biljne masti, biljni hormoni, vitamin C, enzimi, eterična ulja, tanini, heterozidi, holin, cineol. Međutim, prisustvo teških metala, čak i u malim koncentracijama, može biti toksično i dovesti do ozbiljnih poremećaja i bolesti. U ovom radu vršena je analiza mikro i makro elemenata u uzorcima ruzmarina sa područja Hercegovine. Takođe, određen je i sadržaj mikro i makro elemenata u uzorcima zemljišta sa kojeg je ruzmarin uzet za analizu. Priprema uzoraka je vršena mokrom digestijom. Određivanje koncentracije mikro i makro elemenata vršeno je primjenom optičke emisione spektrometrije sa induktivno spregnutom plazmom (ICP-OES). Na osnovu dobijenih rezultata, najveća koncentracija makroelemenata izmjerena je za Ca i iznosi  $11508,74 \pm 37,33$  mg/kg, a najniža koncentracija makroelemenata izmjerena je za Na i iznosi  $387,77 \pm 1,64$  mg/kg. Izmjerene koncentracije teških metala (As, Cd, Pb) su ispod granice detekcije. Koncentracija mikro i makro elemenata u uzorcima zemljišta je ispod maksimalno dozvoljenih koncentracija.

**Ključne riječi:** makro i mikro elementi, ruzmarin, ICP-OES

## ANALYSIS OF MICRO AND MACRO ELEMENTS IN ROSEMARY SAMPLES BY ICP-OES

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**Abstract.** Rosemary (*Rosmarinus officinalis*) is a Mediterranean plant that is used not only as a decoration, but also as a spice and has medicinal properties. This plant contains a lot of medicinal substances, such as vegetable fats, plant hormones, vitamin C, enzymes, essential oils, tannins, heterosides, choline, and cineole. However, the presence of some heavy metals, even in small concentrations, can be toxic and lead to serious diseases. In this paper, the determination of micro and macro elements in rosemary samples from Herzegovina region was carried out. Also, the content of elements in soil samples from which rosemary was taken for analysis was determined. Sample preparation was carried out by wet digestion. The concentration of selected metals in solutions after digestion was determined using inductively coupled plasma optical emission spectrometry (ICP-OES). Based on the obtained results, the highest concentration of macro elements was measured for Ca and is  $11508.74 \pm 37.33$  mg/kg, and the lowest concentration of macro elements was measured for Na and is  $387.77 \pm 1.64$  mg/kg. The measured concentrations of heavy metals (As, Cd, Pb) are below the detection limit. The concentration of micro and macro elements in soil samples is below the maximum permitted concentrations.

**Key words:** macro and micro elements, rosemary, ICP-OES