

Selenium concentration in main soil types of Slavonija and Baranja County

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Summary

Selenium (Se) is an essential element for humans and animals but not for plants. Nevertheless, plants are the main source of food and fodder, therefore the ability of plant to take up Se from soil plays an important role in human and animal nutrition. The bioavailability of Se depends on the plant itself as well as on the concentration of Se in soil. The aim of the present study was to investigate Se concentrations in three main soil types of the main agricultural region of Croatia (Osijek-Baranja County). Forty-six soil samples were collected from agricultural and forest soils (Haplic gleysols (n=18), Stagnosols (n=12) and Luvisols (n=16)) and digested by HNO₃ for determination of total Se. Haplic gleysols showed significantly (p<0.001) higher average concentrations of total Se (538 µg/kg) from Luvisols (323 µg/kg) and Stagnosols (314 µg/kg). Higher concentrations might be related to soil organic carbon (SOC) and total nitrogen (N) as Haplic gleysols also showed significantly (p<0.001) higher percentage of SOC and N from other two soil types. The results of Se concentrations are somewhat higher than the concentrations that can be found in literature regarding Se in soils of Croatia (Požeška kotlina (20-48 µg/kg); Podravina (50-280 µg/kg); Koprivnica (145-333 µg/kg)). Such higher values in the present study could be related to different extraction method. However, these higher concentrations are still relatively low as most soils contain 100 – 2000 µg/kg. In a nutshell, further research in Se bioavailability is necessary in order to better understand Se uptake.

Key words: Osijek-Baranja County, selenium, soil