Occurrence of Li in groundwaters and plants from Dobrogea karst area, Romania

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Abstract

A positive association of Li consumption with the potentially protective and beneficial for the human health was reported (Barjasteh-Askari et al. 2020). Drinking water, grains, or vegetables can be a significant Li source for humans. Microdoses of Li intake may have antisuicidal, mood-stabilizing, antidepressive, and antimanic effects (Knudsen et al. 2017 ; Ng et al. 2019). The assessment of naturally occurring Li concentrations in water and food sources in different regions may present a high interest in the wellbeing of locals. In this study, a versatile quantitative ICP-MS method for Li quantitative determination in water and plant samples was optimized, and the relationship between Li, macroelements (Na, Mg, Al, K, Ca, Fe, Mn), and microelements (Cr, Co, Ni, Cu, Zn, Pb, Sr, Ba, V, As, Sr, Cd, Pb) concentration was assessed. Contents of Li, and micro- and macroelements were measured in groundwater (Praporgescu-GWR27, Closca-GWR28, Sipote-GWR29, and Tufani-GWR30) and plant samples (ryegrass—Lolium sp., nettles—Urtica sp., and mint—Mentha sp.) collected from Dobrogea karst area, Romania. The results indicated an acceptable precision in all studied matrixes and a reproducibility between 2.46 and 4.22% of the developed method. In the case of water, the highest Li concentration was measured in GWR27 followed by GWR28 (12.2 and 5.6 µg/L), while in the case of the plant's samples, *Lolium* sp. collected from GWR28 and GWR27 (11.1 and 8.8 mg/kg DW) had the highest Li concentration.

Keywords

lithium, groundwater, karst, plants, *Lolium* sp., *Urtica* sp., *Mentha* sp.

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Ethics and security

None

Author contributions

Conceptualization, A.I.T., E.A.L. and O.C.; methodology, A.I.T., A.M. and C.T.; analysis, A.I.T., A.M. and C.T.; writing—original draft preparation, A.I.T., A.M. and C.T.; writing—review and editing, O.C., E.A.L. and O.T.M.; funding acquisition, O.T.M. All authors read and agreed to the published version of the manuscript

Conflicts of interest

None declared.

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