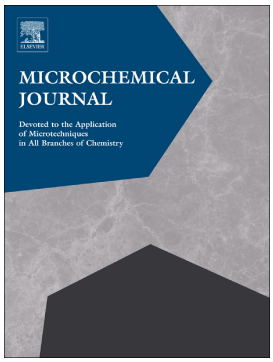

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Optimization of simultaneous determination of metals in commercial pumpkin seed oils using inductively coupled atomic emission spectrometry

Milan Mitić[1*], Aleksandra Pavlović[1], Snežana Tošić[1], Pavle Mašković[2], Danijela Kostić[1], Snežana Mitić[1], Gordana Kocić[3], Jelena Mašković[2]

[1]University of Niš, Faculty of Sciences and Mathematics, Department of Chemistry, Višegradska 33, 18000 Niš, Serbia

[2]University of Kragujevac, Faculty of Agronomy, Cara Dušana 34, 32000 Čačak, Serbia

[3]University of Niš, Faculty of Medicine, Dr Zorana Đinđića 81, 18000 Niš, Serbia

Abstract

In this work, the inductively coupled plasma atomic emission spectrometry (ICP-AES) was developed and validated for determination of 27 metals in nine pumpkin oils from two production processes (cold pressed and roasted). A microwave assisted digestion was applied for the dissolution of the samples. To evaluate plasma robustness and analytical performance, the Mg II 280.270 nm/ Mg I 285.213 nm (Mg II/Mg I) line intensity ratio was used. The robust plasma conditions in axial/radial view mode were reached at an RW power of 1150 W and an argon nebulizer flow rate of 0.5 L/min. The method is evaluated by application of the standard addition method and by recovery test. In general, the recoveries for all elements in pumpkin seed oils were between 90% and 110% except, only for Cd, Pb and As they were <90% and >110%. The most abundant element is K followed by, Mg, P, Ca and Na. Pumpkin seed oils were also found to be a good source of Fe, Zn, Cu and Mn. The highest levels of analyzed elements were found in pumpkin seed oils producing from the roasted pumpkin seed paste. In all samples, the content of heavy metals was below the recommended tolerable levels proposed by Joint FAO/WHO Expert Committee on Food Additives and does not a pose a health risk for the consumer. The levels of the metals in pumpkin seed oils were also