

Evaluation of selenium content in biofortified *Allium* species by chromatographic means

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Abstract

Selenium is an essential trace element in animals and humans. It has chemical properties similar to sulfur. In plants, selenium is involved in several important biochemical routes, including antioxidative processes (Germ *et al.*, 2007). In animals and humans, compared to other micronutrients, there is a much thinner line between the normal concentration and the toxic amount of selenium. The inorganic forms of selenium (selenate, selenite) present a much higher toxicity than its organic combinations (e. g. selenocysteine, selenomethionine) (Herrero Latorre *et al.*, 2013). Thus, a sensitive method is required for detection of selenium species in biological samples. A distinct method is represented by the formation of piaszelenol. This kind of complexes represent the product of reaction between an aromatic *o*-diamine and Se(IV) species, in acidic conditions. This study describes an HPLC-based optimized, sensitive and selective method for determination of selenium in biological samples. The analyzed *Allium* species were grown in our laboratory in a phytochamber. Before the analysis procedures, the biofortified *Allium* samples have been mineralized and pre-concentrated using solid-phase microextraction technique. This analytical step affords an excellent precision and accuracy as it removes the interferences from a typical biological sample, thus allowing a limit of detection as low as 0.5 ng/mL Se.

Keywords: *Allium*, biofortification, piaszelenol, selenium determination

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References

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