

ANTIOXIDANT ACTIVITY OF SELECTED *ALLIUM* SPECIES GROWN IN SERBIA

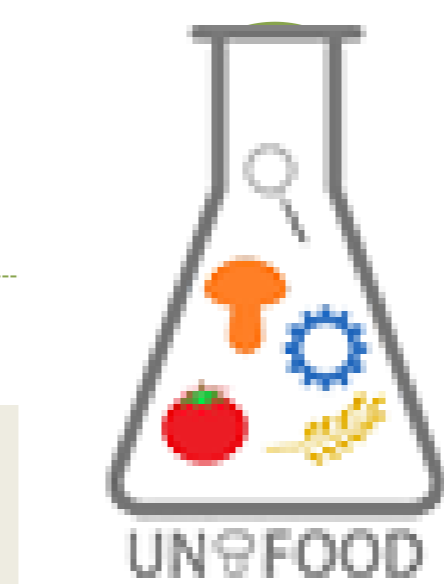


Sandra Vuković^{1*}, Đorđe Moravčević¹, Jelica Gvozdanović-Varga², Sofija Kilibarda¹, Danijel D. Milinčić¹, Ana Vujošević¹, Aleksandar Ž. Kostić¹

¹ University of Belgrade, Faculty of Agriculture, Nemanjina 6, 11080 Zemun, Belgrade, Serbia

² Institute of Field and Vegetable Crops, Maksima Gorkog 30, 21000 Novi Sad, Serbia

*corresponding author: sandra.vukovic@agrif.bg.ac.rs



INTRODUCTION

Allium is one of the largest genus of family Alliaceae and monocots in general. Species of the genus *Allium* are used for different purposes: as food (vegetables, spices, flavor agent in the bakery industry), medical agent in folk medicine, and as decorative perennials. Effect of onion, garlic and leek on human health have been described in many studies. The presence of compounds with potential antioxidant activity are considered responsible for their health effect. Other species of this genus have been intensively studied in recent years in order to estimate their nutritional value and healing effect. The aim of this paper was to determine the antioxidant activity of edible parts of two *Allium* species - *Allium nutans* (Fig. 1a) and *A. odorum* (Fig. 1b).



(a)



(b)

Figure 1. Edible parts of *A. nutans* (a); *A. odorum* (b)

MATERIAL AND METHODS

The tested species (*A. nutans* and *A. odorum*) were grown in Serbia, in open field conditions and were foliar treated with selenium fertilizer (Na_2SeO_4) in four doses (0, 10, 20 and 30 g per ha), in the phase of intensive growth. Edible parts (leaves) of both species were used for prepared extracts in 80% methanol, which were further used for determination antioxidant activity. Antioxidant activity was determined spectrophotometrically, by reading the absorbances of the samples at 515 nm in the case DPPH· assay and at 734 nm in the ABTS^{·+} assay.

The obtained results were expressed as a percentage of inhibition of DPPH· radicals and ABTS^{·+} radical cations caused by the action of the extract of the tested *Allium* species.

RESULTS AND DISCUSSION

The results indicate that *A. odorum* show higher DPPH radical scavenging activity than *A. nutans*. In DPPH assay, the highest antioxidant activity of *A. odorum* was detected in variant IV - 30 g of selenium fertilizer per ha.

In ABTS assay, the highest antioxidant activity was observed in *A. nutans*, in variant II (10 g of selenium fertilizer per ha). In *A. odorum* there was no significant difference in antioxidant activity in the control variant and variant III - 20 g of selenium per ha, in ABTS assay, also (Tab. 1).

Table 1. Antioxidant activity of *A. nutans* and *A. odorum* by DPPH and ABTS assays

| Sample | Variant | | DPPH [*] | ABTS ^{·+} |
|----------------------|---------|-------------------|------------------------------------|------------------------------------|
| | | | \bar{X} (% Inh) \pm SD | \bar{X} (% Inh) \pm SD |
| Allium NUTANS | I | Control | 23.77 \pm 0.19 | 54.92 \pm 1.90 |
| | II | 10 g per ha of Se | 22.55 \pm 0.09 | 69.05 \pm 6.06 |
| | III | 20 g per ha of Se | 21.13 \pm 0.57 | 51.68 \pm 0.23 |
| | IV | 30 g per ha of Se | 18.30 \pm 2.45 | 52.41 \pm 0.64 |
| Allium ODORUM | I | Control | 22.74 \pm 1.23 | 33.41 \pm 0.38 |
| | II | 10 g per ha of Se | 25.00 \pm 0.47 | 32.87 \pm 0.77 |
| | III | 20 g per ha of Se | 23.30 \pm 0.28 | 33.79 \pm 0.46 |
| | IV | 30 g per ha of Se | 25.75 \pm 0.28 | 30.11 \pm 1.84 |

*DPPH· - 2,2-diphenylpicrylhydrazyl cation; ABTS^{·+} - 2,2'-Azino-bis(3-ethylbenzothiazoline-6-sulfonic acid) radical cation

Application of 30 g of selenium fertilizer per ha (Variant IV) was contributed the lowest antioxidant activity of *A. nutans* and *A. odorum*, in DPPH and ABTS assay, respectively.

CONCLUSION

Edible parts of both tested *Allium* species show antioxidant activity. In further research, emphasis should be placed on finding the optimal dose of selenium, which would greatly contribute to the enrichment of these plants with phytochemicals that have a positive effect on human health.