Antioxidant activity and fluorescence of colored maize (*Zea mays* L.) seeds under various temperature conditions

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Introduction

- Maize (*Zea Mays* L.) is the most commonly consumed cereal in the world. High diversity exhibited in cultivated maize is recognized phenotypically by different seed color. The quality of pigmented grain could be correlated to the antioxidant activity (AA). The drying conditions have huge impact on maintaining the seed quality. Fluorescence analysis has a great potential for the rapid and non-expensive characterization of food samples.

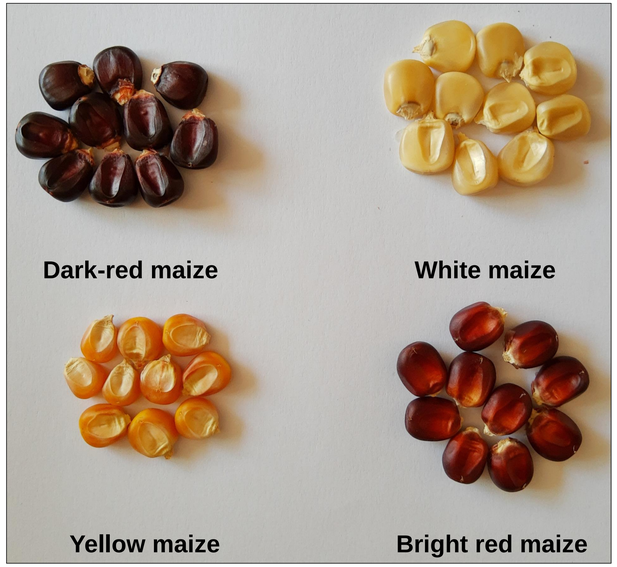
Matherials and methods

Maize seeds were grinded in a mill and further homogenized with liquid nitrogen to obtain a fine powder. Seeds were exposed to different temperatures (25˚C (Control), 45˚C, and 90˚C), for 60 min.
Antioxidant activity (AA%) was determined using DPPH (2,2-Diphenyl-1-picrylhydrazyl) assay and expressed in percentages. Samples were incubated for 30 min. with 0.1 mM DPPH in 70% ethanol and shaken in the dark. Absorbance (A 517 nm) was measured using UV-VIS microplate reader. The front-face fluorescence measurements were recorded using an FI3-221 P spectrofluorimeter (JobinYvob, Horiba, France). The emission spectra were recorded in the range 480-680nm, after excitatiob at 360 nm.

Conclusion

- Both methods have proven to be useful for monitoring changes caused by temperature treatment of the seeds but could also be applied for characterization and quality control of seeds after different types of treatments.

Results and discussion



Incubation at high temperature caused an increase in the antioxidant activities of all maize seeds types (Fig. 1). The fluorescence analysis indicates differences in emission spectral parameters among the analysed seed types (Fig. 2) and effect of various temperature conditions (Fig. 3).

DPPH Assay

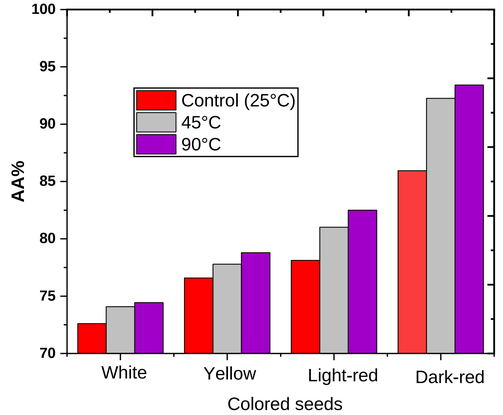
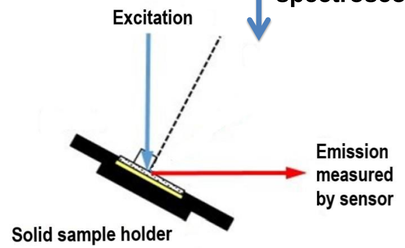


Fig.1

Fluorescence spectroscopy



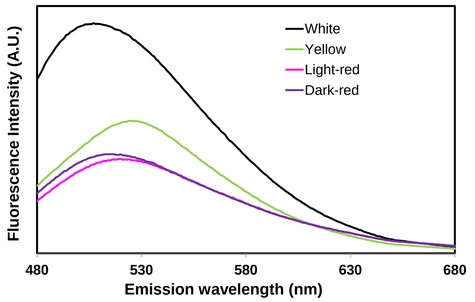


Fig.2

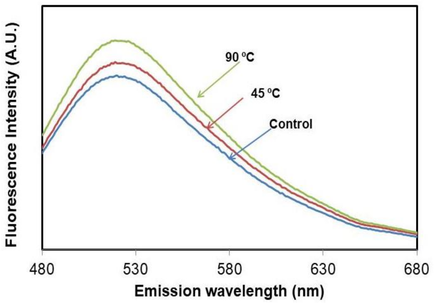


Fig.3

Acknowledgments: This work was supported by the Ministry of Education, Science and Technological Development of the Republic of Serbia (Grant no. 451-03-9/2021-14/200053).