



# Changes of antioxidant potential of cold-pressed edible oils determined by different antioxidant assays during storage

Sanja Kostadinović Veličkovska<sup>1</sup>, Saša Mitrev<sup>1</sup> and Borjanka Veselinova<sup>2</sup>

<sup>1</sup>Faculty of Agriculture, "Goce Delčev" University, Krste Misirkov bb, 2000 Štip, Macedonia

<sup>2</sup>Faculty of Medical Sciences, "Goce Delčev" University, Krste Misirkov bb, 2000 Štip, Macedonia

Macedonia

Contact authors: borjanka.veselinova@ugd.edu.mk

## Introduction

Cold pressed edible oil consumption has risen worldwide due to its health benefits over the refined oils. However, these oils have a tendency to be oxidized by temperature, light and oxygen resulting in unpleasantness and formation of toxic materials. The main object of our study was the changes of antioxidant activity of sunflower and flaxseed oil after 2 months storage in dark glass bottles. The ant was determined by measuring the inhibition of conjugated diene hydroperoxides arising from linolenic acid oxidation.

## Materials and methods

For the DPPH assay, the antioxidant activities of the oils were expressed as percentage of decolorization of a solution of the stable radical DPPH (2,2-diphenyl-1-picrylhydrazyl radical) at 517nm. DPPH reagent was dissolved in hexane and 0.25mL of the stock solution with a concentration of 0.5M was used for the determination of the antioxidant activity. The Trolox equivalent antioxidant assay (TEAC) employed in this study gives a measure of the antioxidant activity of methanol extracts of the oils under study. For this purpose, 10 mL of ABTS(2,20-azino-bis(3-ethylbenzothiazole-6-sulphonic acid) solution was prepared from 39.23mg of ABTS and 7.17mg of K<sub>2</sub>S<sub>2</sub>O<sub>2</sub> dissolved in Nanopure water to volume. For the calibration curve with Trolox, four standard solutions were prepared in the range from 10 to 500mg/L

	After 2 months	DPPH/mgL <sup>-1</sup>	Hb in human blood	TEAC
Sunflower oil		198,72	566,86	13,19
Sesame oil		166,92	280,21	87,29
	Before 2 months			
Sunflower oil		560,7	796,94	18,27
Sesame oil		353,5	659,3	128,5

## Results and discussion

The oxidation of sunflower and sesame oil was the most evident by application of DPPH radical assay. The antioxidant potential of sunflower oil was decreased for more than four times while antioxidant potential of sesame seed oil was almost half which can be lined to decreased activity of vitamin-E-active compounds. Hb assay in human blood indicated higher instability of sesame seed oil and the same tendency was noticed for TEAC assay. From the results presented in this work we can conclude that DPPH assay is strongly dependent to the amounts of tocopherols, while TEAC assay is more dependent to polyphenols and lignans which are dominant in cold-pressed sesame seed oil.

## References:

Kostadinović Veličkovska, S., Brühl, L., Mitrev, S., Mirhosseini, H. and Matthäus, B. (2015), Quality evaluation of cold-pressed edible oils from Macedonia. Eur. J. Lipid Sci. Technol., 117: 2023-2035. <https://doi.org/10.1002/ejlt.201400623>

## Conclusion

The antioxidant activity of sunflower and sesame cold-pressed oils is significantly influenced of storage conditions. Decreasing of antioxidant potential can be linked to decreased amount of α-tocopherol and other Vitamin-E-active compounds in sunflower oil while lower level of lignans and polyphenols are responsible for lower antioxidant potential of sunflower oil.

