

CHEMOMETRIC APPROACHES IN ANALYSIS OF VEGETABLE OILS AS A WAY TO IMPROVE AN EFFICIENCY OF FORENSIC EXAMINATION

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References:

1. Wang T., Wu H.L., Long W.J., Hu Y., Cheng L., Chen A.Q., Yu R.Q. Rapid identification and quantification of cheaper vegetable oil adulteration in camellia oil by using excitation-emission matrix fluorescence spectroscopy combined with chemometrics. *Food Chem.* 2019, 293, 348–357.
2. Ozulku G., Yildirim R.M., Toker O.S., Karasu S., Durak M.Z. Rapid detection of adulteration of cold pressed sesame oil adulterated with hazelnut, canola, and sunflower oils using ATR-FTIR spectroscopy combined with chemometric. *Food Control.* 2017, 82, 212–216.
3. Jiménez-Carvelo A.M., Lozano V.A., Olivieri A.C. Comparative chemometric analysis of fluorescence and near infrared spectroscopies for authenticity confirmation and geographical origin of Argentinean extra virgin olive oils. *Food Control* 2019, 96, 22–28.
4. Ruiz-Samblás C., Cuadros-Rodríguez L., González-Casado A., Mata-Espinosa P., García F., Bosque-Sendra J.M., Multivariate analysis of HT/GC-(IT)MS chromatographic profiles of triacylglycerol for classification of olive oil varieties. *Anal. Bioanal. Chem.* 2011, 399, 2093-2103.
5. Lamba N., Modak J.M., Madras G. Fatty acid methyl esters synthesis from non-edible vegetable oils using supercritical methanol and methyl tert-butyl ether. *Energy Conversion and Management.* 2017, 138(15), 77-83.
6. Moradi-Kheibari N., Ahmadzadeh H., Murry M. A. Advances in Feedstock Conversion Technologies for Alternative Fuels and Bioproducts. *Woodhead Publishing Series in Energy.* 2019, 239-254.
7. Kiritsakis A., Christie W.W. Analysis of Edible Oils. Handbook of Olive Oil. *Springer, Boston, MA.* 2000, 129-158.
8. Tsopelas F., Konstantopoulos D., Kakoulidou A.T. Voltammetric fingerprinting of oils and its combination with chemometrics for the detection of extra virgin olive oil adulteration. *Analyt. Chim. Acta.* 2018, 1015, 8-19.
9. Li X., Kong W., Shi W., Shen Q. A combination of chemometrics methods and GC-MS for the classification of edible vegetable oils. *Chemometrics and Intelligent Laboratory Systems.* 2016, 155, 145-150.
10. Niftaliev S.I., Mel'nikova E.I., Selivanova A.A. Gazohromatograficheskoe opredelenie zhirnokislotochnogo sostava zamenitelej molochnogo zhira i drugih specializirovannykh zhirov. *Sorbcionnye i hromatograficheskie processy.* 2009, 9(4), 574-581.
11. Sales C., Portolés T., Johnsen L.G., Danielsen M., Beltrana J. Olive oil quality classification and measurement of its organoleptic attributes by untargeted GC-MS and multivariate statistical-based approach. *Food Chemistry.* 2019, 271, 488-496.
12. Baeten V., Aparicio R. Edible oils and fats authentication by Fourier transform Raman spectrometry. *Biotechnol. Agron. Soc. Environ.* 2000, 4(4), 196-203.
13. Jabeur H., Zribi A., Bouaziz M. Extra-Virgin Olive Oil and Cheap Vegetable Oils: Distinction and Detection of Adulteration as Determined by GC and Chemometrics. *Food Analytical Methods.* 2016, 9, 712–723.
14. Jiménez-Carvelo A.M., González-Casado A., Cuadros-Rodríguez L. A new analytical method for quantification of olive and palm oil in blends with other vegetable edible oils based on the chromatographic fingerprints from the methyl-transesterified fraction. *Talanta.* 2017, 164, 540-547
15. Jiménez-Carvelo A. M., Pérez-Castaño E., González-Casado A., Cuadros-Rodríguez L. One input-class and two input-class classifications for differentiating olive oil from other edible vegetable oils by use of the normal-phase liquid chromatography fingerprint of the methyl-transesterified fraction. *Food Chemistry.* 2017, 221, 1784-1791.
16. Agilent Technologies. Last access 13.10.2019: <https://www.agilent.com/en/products/gas-chromatography/gc-columns/capillary/cp-sil-88-for-fame>.
17. Rudnev V.A., Boichenko A.P., Karnozhytskiy P.V. Classification of gasoline by octane number and light gas condensate fractions by origin with using dielectric or gas-chromatographic data and chemometrics tools. *Talanta.* 2011, 84(3), 963-970.
18. Kamal-Eldin A., Moazzami A., Washi S., Sesame Seed Lignans: Potent Physiological Modulators and Possible Ingredients in Functional Foods & Nutraceuticals. *Recent Patents on Food, Nutrition & Agriculture.* 2011, 3(1), 17-19.