IBSC

International Bioscience Conference and the
8th International PSU – UNS Bioscience Conference

Towards the SDG Challenges

ONLINE

25-26 November 2021, Novi Sad, Serbia

BOOK OF ABSTRACTS

IBCS2021 is organized jointly by:

University Prince of Songkla, Thailand

FACULTY OF SCIENCE

University of Novi Sad, Faculty of Sciences, Serbia

CIP - Каталогизација у публикацији
Библиотеке Матице српске, Нови Сад

631(082)(048.3)
602(082)(048.3)
502/504(082)(048.3)

THE International Bioscience Conference (2021 ; Novi Sad)
[Book of abstracts] / The International Bioscience Conference and the 8th International PSU - UNS Bioscience Conference IBSC 2021, 25-26 November, 2021 ; [editors Neda Mimica-Dukić, Slobodanka Pajević, Anamarija Mandić]. - Novi Sad : Prirodno-matematički fakultet, 2021. - 261 str. : ilustr. ; 30 cm

Način pristupa (URL): https://ibsc2021.pmf.uns.ac.rs/ebook-of-abstracts/. - Registar.

ISBN 978-86-7031-541-9

1. Joint international PSU-UNS Bioscience Conference (6 ; 2021 ; Novi Sad)
а) Пољопривреда -- Зборници -- Апстракти б) Биотехнологија -- Зборници -- Апстракти в) Животна средина -- Заштита -- Зборници -- Апстракти

COBISS.SR-ID 53483017

METHOD / DESIGN:

The raw material for the extraction of bioactives was the grapeskin of red grape variety as byproduct of vinification. Microencapsulates were obtained using different carriers such as maltodextrin, gum Arabic and skimmed milk powder, and spray and freeze drying as encapsulation techniques widely used in the food sector. Oat meals and yoghurts enriched with microencapsulates were the final products which characteristics were tested by sensorial panel.

RESULTS:

All tested microencapsulates showed extremely low water activity (0.2-0.3), and very high solubility (around 90% m/m). Microencapsulation yields varied from around 65 to 93%. Total phenol contents ranged from 5.8 to 11.6 mg GAE/g and was the highest in microencapsulates produced by freeze drying with gum Arabic. The results of the assessment of sensorial characteristics showed very high average sensory scores, over 7 and 8. In comparison to the standard products the colour change was the most noticeable, due to the anthocynins content in the added microencapsulates. Sensorial analysis indicated that the highest potential for the application in food products have shown microencapsulates based on maltodextrin.

CONCLUSIONS:

These results have shown that spray dried and freeze dried microencapsulates of grapeskin as byproducts of agri-food processing could be used as a source of natural pigments and bioactives with improved stability. Microencapsulates obtained in this research can be applied as multipurpose additives in dairy, confectionery, bakery products as well as beverages and soft drinks.

Namely, except their bioactive potentials, these microencapsulates could be a substitute for artificial colorants present in the numerous food products nowadays.

T4-P-13 Machine learning chemometric model for Raman spectroscopy based honey quality assessment

Stefan M. Kolašinac, Ilinka Pećinar, Zora P. Dajić Stevanović[49]

KEYWORDS: honey; adulteration; raman spectroscopy; support vector machine

INTRODUCTION:

According to Codex Alimentarius (2001), "Honey is the natural sweet substance, produced by honeybees from the nectar of plants or from secretions of living parts of plants, or excretions of plant-sucking insects on the living parts of plants, which the bees collect, transform by combining with specific substances of their own, deposit, dehydrate, store and leave in honeycombs to ripen and mature". Honey is mostly made up of sugars, as well as enzymes, amino acids, organic acids, vitamins, aromatic compounds, minerals and carotenoids. It contains a lot of flavonoids and phenolic acids, which have a lot of biological effects and functions such as natural antioxidants, anti-inflammatory and antimicrobial properties. Its composition is particularly variable, depending on its botanical and geographical origins Because of its exclusive flavor and high dietary value, natural honey is more expensive than other sweeteners. This is the reason why honey is a target of adulteration. The problem is that counterfeiting honey is relatively easy, but detection is difficult. Further, the authenticity of honey is a global important problem for commercial producers and consumers. Accordingly, a fast and non-destructive method of detecting counterfeits is needed.

49 *University of Belgrade, Faculty of Agriculture, Nemanjina 6, Belgrade, Serbia. Corresponding author: stefan.kolasinac@agrif.bg.ac.rs*

OBJECTIVES:

The aim of this paper is to verify the possibility of Raman spectroscopy and Support Vector Machine (SVM) for classification of two different honeys and their fake duplicates. For this purpose, meadow and acacia honeys were selected.

METHOD / DESIGN:

Spectra of homemade and counterfeits honey were recorded using XploRA Raman spectrometer (Horiba Jobin Yvon). Raman scattering was excited by laser at a wavelength of 785 nm equipped with a 600 lines/mm grating; spectra were recorded by applying exposure time 10 s and accumulated from 10 times scans, using 100% filter. Spectral resolution was 3 cm−1 and autocalibration was done each time before recording of spectra by 520.47 cm^{-1} line of silicon. In order to assess a possible sample inhomogeneity, thirty Raman spectra in the region from 200-3400 cm^{-1} were recorded for each sample. All spectra were baseline-corrected, normalized and smoothed. After that PCA (Principal component analysis) was conducted and obtained PCs (first two PCs) served as a features for support vector machine (SVM) classification method. Data were divided into training model (70 %) and training data (30 %). Pre-processing was done by Unscrambler X 10.4 software (CAMO software, Norway). In order to determine the best shape of the hyperplane and decision boundary, several kernel function were used: linear, radial basis and polynomial function. The SVM was conducted by Python and Scikit-learn package.

RESULTS:

Support vector machine showed high accuracy in classification of different honey samples. Accordingly, the best discrimination power showed SVM with polynomial function (100%), followed by radial basis (96.67%) and linear (81.82%).

CONCLUSIONS:

Results showed that SVM algorithm can be used as a tool for detection of fraudulent honey products.

ACNOWLEDGMENT:

This work was supported by Ministry of Education, Science and Technological Development of Republic of Serbia, the contract No. 451-03-68/2020-14/200116 and the EthnoHERBS-H2020-MSCA-RISE-2018 project.

T4-P-14 Mistletoe (*Viscum Album L.*) as a source of valuable antioxidants

Stefan M. Kolašinac[50], Aleksandar Ž. Kostić[50], Danijela Maksimović[51], Sanja Mijatović[51], Nikola Tanić[51], Nebojša Arsenijević[52], Zora P. Dajić Stevanović[50]

KEYWORDS: *Viscum album sp.*; phytochemicals; antioxidants

INTRODUCTION:

Viscum album L. (Loranthaceae Juss.) is semi-parasitic evergreen shrub distributed in Europe, northwestern part of Africa and Anatolia. The species is hosted by different woody gymnosperm and angiosperm species and it is known that host preference usually reflects in differences in morphological traits and possibly in phytochemical composition. Therefore, there are different subspecies, out of three subspecies (*V. album* subsp. abietis (Wiesb.) Janchen, subsp. *creticum* N. Böhling & al. and

50 University of Belgrade, Faculty of Agriculture, Nemanjina 6, 11080 Belgrade, Serbia. Corresponding author: stefan.kolasinac@agrif.bg.ac.rs

51 University of Belgrade, Institute for Biological Research "Siniša Stanković", National Institute of Republic of Serbia, Bulevar Despota Stefana 142, 11060 Belgrade, Serbia

52 University of Kragujevac, Faculty of Medical Sciences, Svetozara Markovića 69, 34000 Kragujevac, Serbia