5th INTERNATIONAL CONFERENCE ON NATURAL PRODUCTS UTILIZATION

FROM PLANTS TO PHARMACY SHELF

30 May
02 June
2023

Sts. Constantine
and Helena Resort
BULGARIA

BOOK OF ABSTRACTS

IL 9

CLIMATE CHANGE PREDICTION MODEL FOR PLANT BIOACTIVE COMPOUNDS: HOPS (*HUMULUS LUPULUS* L.) AS A MODEL PLANT FAR BEYOND A BREWING USE

Zora Dajic Stevanovic[1], Stefan Kolasinac[1], Jan Kisgeci[2]

[1] University of Belgrade, Faculty of Agriculture, Republic of Serbia
[2] University of Novi Sad, Faculty of Agriculture, Republic of Serbia

The hops (*Humulus lupulus* L.) is widely cultivated for its female inflorescences used in brewing industry, but also for obtaining a range of plant bioactive molecules for use in pharmaceutical, food and cosmetic industry. Today there are more than 250 cataloged hops varieties, mainly differing in their phytochemical profiles. The key resin metabolites are the prenylated phloroglucinol derivatives, the alpha-and beta acids, also known as humulones and lupulones, respectively [1]. Promising health benefits have been mostly assigned to hop terpenophenolics (bitter acids, prenylchalcones, and prenylflavonoids), especially related to prevention of thrombosis, metabolic syndrome, anticancer and anti-diabetic effects. The sedative, antidepressant and anxiolytic effects are attributed to ability of humulones and prenylflavonoids to modulate GABA CNS receptors and to regulate circadian rhythm [2]. The hops' 8-prenylnaringenin is considered as the most potent known phytoestrogen. The characterization and quality assessment of different crop and industrial product, including hops, has been recently performed by modern vibrational spectroscopy techniques, such as Raman spectroscopy [3]. In our paper, traditional and current application of hops metabolites with highlighting of their bioactivity is further discussed. Special focus was put on development of a climate change prediction model, targeting main humulone and lupulone compounds determined in 7 hop varieties grown in a long-term field experiment comprising simultaneous monitoring of wide set of climatic variables. Prediction model aimed to assess the phytochemical profiles of selected hop varieties upon climate change impact by application of complex multivariate biostatistics matrices, such as PLS regression, PCR and SVM regression.

Acknowledgements: The work was supported by the Ministry of Science, Technological Development and Innovation of the Republic of Serbia and the Faculty of Agriculture, Belgrade (No: 451-03-47/2023-01/200116).

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