

Abstract

Fruit Wine and Its Biologically Active Compounds' Ability in Health Prevention [†]

Uroš Čakar ^{1,*}, Maria Čebela ², Aleksandar Petrović ³, Ivan Stanković ¹ and Brižita Đorđević ¹

¹ Department of Bromatology, Faculty of Pharmacy, University of Belgrade, 11 000 Belgrade, Serbia; ivan.stankovic@pharmacy.bg.ac.rs (I.S.); brizita.djordjevic@pharmacy.bg.ac.rs (B.Đ.)

² Vinča Institute of Nuclear Sciences—National Institute of the Republic of Serbia, University of Belgrade, 11 000 Belgrade, Serbia; mcebela@vinca.rs

³ Institute of Food Technology and Biochemistry, Faculty of Agriculture, University of Belgrade, 11 000 Belgrade, Serbia; aleksandar.petrovic@agrif.bg.ac.rs

* Correspondence: uros.cakar@pharmacy.bg.ac.rs

[†] Presented at the 14th European Nutrition Conference FENS 2023, Belgrade, Serbia, 14–17 November 2023.

Abstract: Background and objectives: Blackberry is one of the most important berry fruits growing in Serbia. Crops and derived products are rich sources of many natural active compounds, which possess beneficial health effects. In particular, it is possible to point out the role of blackberry and its derived products in hyperglycemia prevention since it is a very common problem among the general population today. Blackberry wine is a product which could have significant beneficial health effects during moderate consumption. The aim of this study was to investigate the α -glucosidase inhibitory activity of blackberry wine and the contribution of some natural compounds to this activity. Methods: Fruit wines were produced through microvinification during controlled fermentation by using pure yeast strain culture. Samples were lyophilized and dissolved in DMSO. The inhibition of α -glucosidase was evaluated by using α -glucosidase and substrate solution, p-nitrophenyl α -D-glucopyranoside. The identification and quantification of some natural compounds was conducted by using UPLC TQ-MS/MS. Results: After lyophilization of the produced blackberry wine, all of the determinations were conducted in four samples. The results for the α -glucosidase inhibitory activity were in the range of 31.5–55.7 $\mu\text{g}/\text{mL}$. The control showed acarbose whit inhibitory activity of 75.3 $\mu\text{g}/\text{mL}$. Moreover, the estimated amount of epicatehin, catehin, chlorogenic, ellagic, and gallic acids and their contribution to the α -glucosidase inhibitory activity of the sample was from 1.7% to 7.7%. Discussion: The obtained results show that blackberry wine is a good inhibitor of α -glucosidase compared to acarbose. The presence of phenolic compounds in wine is due to its extraction from the skin and seeds of blackberry during alcoholic fermentation. Ethanol, which naturally occurs in wine, has a key role in this process. Fruit wine can be considered as a potential functional food. α -glucosidase activity depends on the synergistic and antagonistic effect of natural active compounds in fruit wine.

Keywords: blackberry wine; α -glucosidase inhibition; phenolic compounds



Citation: Čakar, U.; Čebela, M.; Petrović, A.; Stanković, I.; Đorđević, B. Fruit Wine and Its Biologically Active Compounds' Ability in Health Prevention. *Proceedings* **2023**, *91*, 393. <https://doi.org/10.3390/proceedings2023091393>

Academic Editors: Sladjana Sobajic and Philip Calder

Published: 4 March 2024



Copyright: © 2024 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

Author Contributions: Conceptualization, U.Č., A.P. and B.Đ.; methodology, U.Č. and M.Č.; software, U.Č.; validation, U.Č. and M.Č.; formal analysis, U.Č.; investigation, U.Č.; resources, B.Đ. and I.S.; data curation, U.Č.; writing—original draft preparation, U.Č.; writing—review and editing, A.P. and B.Đ.; supervision, A.P. and B.Đ.; project administration, B.Đ.; funding acquisition, I.S. and B.Đ. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by: Ministry of Science, Technological Development and Innovation, Republic of Serbia and the University of Belgrade-Faculty of Pharmacy (no. 451-03-47/2023-01/200161).

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: Not applicable.

Conflicts of Interest: The authors declare no conflict of interest.

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.