

## **2<sup>nd</sup> SCIENTIFIC CONFERENCE**

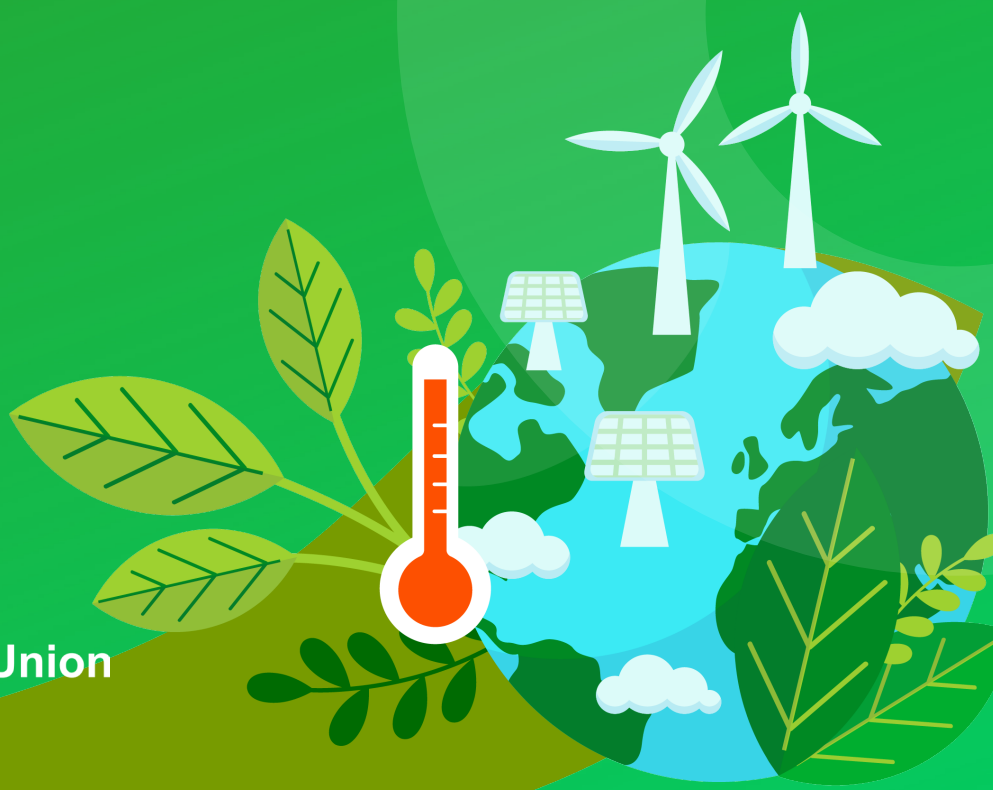
**FOR CRITICAL ENVIRONMENTAL ISSUES OF  
THE WESTERN BALKAN COUNTRIES**

# **BOOK OF ABSTRACTS**

October 28<sup>th</sup> to 30<sup>th</sup>, 2021, Faculty of Agriculture, Goce Delčev University, Štip,  
Republic of North Macedonia



Funded by  
the European Union





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## **ORGANIZERS:**

Goce Delčev University, Faculty of Agriculture, Štip,  
Republic of North Macedonia

WBAA-Western Balkan Alumni Association

The conference is organized and financed within the project titled “Extracting Green-COVID effects for generating clean technologies and successful youth transition awareness for the climate change and sustainable development of the Western Balkan countries”, **project number 2021030, financed by Western Balkans Alumni Association.**

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## WELCOME

On behalf of the project coordinators of

“Extracting Green-COVID effects for generating clean technologies and successful youth transition awareness for the climate change and sustainable development of the Western Balkan countries”

Project number 2021030

financed by Western Balkans Alumni Association

*The project involves networking of students and scientific researchers from Western Balkan countries for creating dataset base of the latest chemi-metric approaches for environmental pollution/protection and ecological effects as well. Even the environmental pollution is a global problem, the latest research indicate that the Western Balkan countries are significantly affect with the environmental pollution. Furthermore, the Western Balkan countries still deals with the problem of poor population awareness for environmental protection. Therefore, this project idea is to unite knowledge from Western Balkan countries and share with youth from this region, increasing the environmental protection awareness within students. Therefore, the students will have the main role in lunching the environmentally friendly aspects for creating novel chemi-metric models in environmental sciences. The beneficiary effect for the Western Balkan students will be creating long-term valuable and sustainable correlations.*

*The project has regional focus, networking six universities from the Western Balkan countries (students and scientific experts and professors). Furthermore, this project has a national focus for the students from three state universities from North Macedonia (students from Goce Delčev University in Štip, Ss. Ss. Cyril and Methodius University in Skopje and University in Tetovo and St. Kliment Ohridski University - Bitola). Even the environmental pollution is a global problem, the latest research indicate that the Western Balkan countries are significantly affected with the pollution, pointing strongly on heavy metal industry, uncontrolled xenobiotic introduction in the different parts of the environment, electronic waste disposal etc. Furthermore, the Western Balkan countries still deals with the problem of poor population awareness for environmental protection. Therefore, this project will involve regional and national students and scientific researches in order to provide novel chemi-metric methodology and beneficial environmental protection methods.*

*The project intends to involve three national and five regional universities (WBAA members). Each regional university will participate with one scientific expert (university professor) and two students (WBAA member). Three national universities (Ss. Cyril and Methodius University in Skopje, State University in Tetovo and St. Kliment Ohridski University - Bitola) will participate with one scientific expert and three students. Goce Delčev University will participate with scientific experts, young researchers and students. Participants from North Macedonia, Albania, Kosovo, Serbia, Bosnia and Hercegovina and Montenegro shall collaborate for the benefit of the whole region for several critical environmental issues.*

*Overall objective: Use of universities' expertise in creation new valuable, suitable and accurate chemimetric models for predicting and measuring the contamination level in different parts of the environment (air, soil, water, plant food). Creating a regional scale of experience for determining the anomalous parts of the environment. Proposing new ideas for national and regional strategies for environmental protection. Promoting new ideas for Inter-university cooperation. Creating sustainable University network for continuous cooperation in the field of environmental monitoring, pollution and protection (both, for students and researchers).*

**Assoc. Prof. Biljana Balabanova**

**Kiril Jordanov**

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## ***About the Western Balkans Alumni Association (WBAA)***

The Western Balkans Alumni Association (WBAA) is a regional network of students and alumni from the Western Balkan region (Albania, Bosnia and Herzegovina, Kosovo\*, North Macedonia, Montenegro, Serbia) who have spent part of their studies in one of Erasmus+ programmed countries. These exchanges were mostly funded by the European Commission. WBAA is neutral, unbiased and nonpartisan in the existing political discourse.

WBAA is supported and funded by the European Commission.

WBAA Mission:

- Advocating modernization and improvement of higher education quality in the region;
- Empowering young people of the Western Balkans on their academic and career development towards successful employment;
- Strengthening regional exchange, collaboration and integration;
- Supporting region's efforts towards European integration;

Web page:

<https://www.western-balkans-alumni.eu/>

FB page: <https://www.facebook.com/WesternBalkansAlumniAssociation/>

Instagram: @wbaassociation

e-mail: [info@western-balkans-alumni.eu](mailto:info@western-balkans-alumni.eu)

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## OP2

### DETERMINATION OF CHLOROPHYLL IN WATER SAMPLE

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#### Abstract

Chlorophylls are ubiquitous pigments in the plant kingdom that play a key role in photosynthesis, a vital function for life on Earth. Increase in phytoplankton biomass is a direct consequence of advancing eutrophication. Although algae are a natural part of freshwater ecosystems, too much algae can cause aesthetic problems such as green scums and bad odors, and can result in decreased levels of dissolved oxygen.

Rivers and streams are monitored for excessive growth of phytoplankton due to high concentrations of plant nutrients. This excessive growth can lead to eutrophication of the river or stream and cause deadly fish kills. For similar reasons, lake, pond, and reservoir monitoring, including lake profiling studies, also observe excessive algae population distribution and growth. Algae control is a major concern in pond management, especially in smaller bodies of water, where excessive algae growth can quickly become a problem.

Measuring chlorophyll concentration is also a step in the process of screening/monitoring for nuisance algal blooms that may influence the taste and odor of drinking water sources. These blooms may actually create conditions that are toxic to fish, wildlife, livestock, and humans. Bodies of water used as drinking water sources are also monitored for phytoplankton concentrations for the early detection of algal blooms to minimize filtration system clogs.

There are various techniques to measure chlorophyll, including spectrophotometry, high-performance liquid chromatography (HPLC), and fluorometry. Spectrophotometry is the classical method of determining the quantity of chlorophyll in surface water.

UNILAB laboratory conducts water quality analysis, including a validated spectrometric method for determination of chlorophyll in surface and waste water samples. Quality assurance (QA) has become an increasingly important topic, as environmental monitoring bodies realize that accuracy of measurements can depend very much on how the measurement is taken.

This study presents the methodology for chlorophyll extraction from water samples and subsequent spectrometric determination of the extracted chlorophyll. Waters samples with higher concentrations of nutrients from fertilizers, septic systems, sewage treatment plants and urban runoff, usually have excess amounts of algae and increase concentrations of chlorophyll a.

**Keywords:** Chlorophyll, analytical challenges, surface water, waste water.