The microbiological component of water is an important factor in determining its quality and purity and should therefore be tested regularly. Proper testing and monitoring can prevent the spread of disease and ensure safe drinking water for humans.

Increasing health literacy is crucial for a healthy society therefore education in the field of microbiology is an essential part of the educational standards of the present time. Currently in Slovakia, the time allocation for topics related to the "world of microbes" is limited to a few teaching hours at lower and upper secondary education. From this point of view, it is necessary to gradually introduce activities aimed at the development of knowledge and skills in the field of microbiology so that students have more opportunities to develop key competencies that are closely related to this topic. There is opportunity for teacher´screativity to implement the microbiology in the context of other topics taught in the Biology subject. Of course, the preparation of teachers and the analysis of standards is time-consuming, so it seems necessary to make available methodological materials that would be easy to implement in practice.

Cyanobacteria as potential biofertilizer?

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Cyanobacteria, widespread microorganisms capable of carrying out oxygenic photosynthesis, have played a crucial role in the evolution of life on Earth, being among the oldest living beings. As primary producers in various habitats, their photoxygenic capability is vital for the development and survival of other life forms, even in extreme environmental conditions [4]. To adapt to biotic and abiotic stress, cyanobacteria have evolved diverse features, resulting in different taxa with varying morphologies and biochemical and physiological capabilities. Many species can fix atmospheric nitrogen, while certain strains can produce bioactive compounds, including potent toxins known as cyanotoxins. These characteristics give cyanobacteria both positive and negative impacts on the environment and human activities [2].

The present study aims to investigate the potential utilization of cyanobacteria as a sustainable biofertilizer in agriculture. Through the characterization of selected cyanobacteria and the evaluation of their biological activity, as well as the examination of their impacts on plant growth and development, we aim to demonstrate their ability to enhance soil nutrients and improve soil structure. Moreover, the application of cyanobacteria as biofertilizers has the potential to decrease dependence on chemical fertilizers, thereby promoting a more sustainable agricultural approach. This study provides valuable insights into the prospects of cyanobacteria as an alternative source of fertilizers, thereby unlocking new potentialfor research in the field of biofertilizers [5].

Within the studied region, heightened concentrations of heavy metals have been observed, resulting from either atmospheric migration or deposition from nearby mountain ranges. The primary risk elements identified include chromium (Cr), nickel (Ni), mercury (Hg), and arsenic (As). Intensive agricultural practices in the monitored area have caused a localized increase in the concentrations of specific risk elements beyond their reference values, indicating slight elevations. The elevated concentrations encompass cadmium (Cd) and nickel (Ni), likely attributed to phosphate fertilization, as well as copper (Cu) and zinc (Zn) [2]. These findings underscore the significance of exploring alternative fertilization approaches, such as the utilization of cyanobacteria, which not only offer the potential for sustainable nutrient enrichment but also help mitigate the risks associated with heavy metal accumulation in agricultural soils. By reducing reliance on chemical fertilizers, the application of cyanobacteria as biofertilizers presents a promising source for advancing sustainable agricultural practices. This study emphasizes the necessity for further research in the realm of biofertilizers, aiming to optimize their application techniques and maximize their positive impact on soil quality and crop production [1].

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Detection of some microorganisms in the wastewater treatment plant in the Aiud city, Romania

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Water pollution has become a global problem, being determined most of the time by human activities. In Romania, almost half of the water bodies have a poor quality. Wastewater Treatment is carried out in several stages to reduce or remove pollutant loads. This treatment has an important role in the water purification and, in this study, the ecophysiological bacteria (aerobic heterotrophic bacteria, ammonifying, nitrifying and denitrifying bacteria) present in the water that goes through the purification process at the Aiud Wastewater Treatment Plant and the physico-chemical parameters were analyzed.

The degree of water pollution, following the calculation of the bacterial water quality indicator, indicates that the water is relatively good (BWQI=1.55-1.66) and is effectively purified and can be discharged without any risk into the Mureș River.

Трансформація мікробіоти водних екосистем в умовах антропогенного впливу (на прикладі річки Уж)

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Мікробіоту природних водоймищ формують автохтонні та аллохтонні групи мікроорганізмів. Автохтонна мікробіота – сукупність мікроорганізмів, що постійно мешкають й розмножуються у воді. Частково ця група поповнюється мікроорганізмами прибережної зони: ґрунту, мулу та повітря. Автохтонні мікроорганізми чистих водоймищ представлені сапрофітами ґрунту *Azotobacter, Nitrobacter, Pseudomonas fluorescens, Micrococcus, Micrococcus roseus* та ін. Аллохтонна мікробіота представлена мікрорганізмами, що потрапляють ззовні з різних джерел забруднення. Джерелом аллохтонних мікроорганізмів є виділення людей, тварин, господарсько-побутові, промислові стічні води. Серед аллохтонних можуть зустрічатись й патогенні для людини мікроорганізми. Мікробіота річок залежить від ступеня їх біологічної забрудненості та якості очистки стічних вод. Динаміка мікробних угруповань є чутливою біоіндикаторною системою, що відображає не тільки стан, але й функціонування мікробних угруповань, та у значній мірі, екосистеми в цілому.

З метою проведення оцінки мікробіоти води на моніторингових ділянках р. Уж (1- Сторожниця, 2- Боздош (поблизу каналізаційного стоку), 3- Боздош (500 м від стоку), 4- Кам’яниця)