

Проблеми забруднення водних екосистем // Problems of water ecosystems pollution

Riverine area of Tisa altered by obsolete river regulation project

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Tisa River is one of the most important rivers in Europe, regarding the natural heritage. It flows through four countries, Ukraine, Romania, Hungary and Serbia. Being an international river, all the four countries should provide additional care to this river, so that transboundary environmental damage does not occur. Due to the river continuum, a river is like an organism. An environmental damage on one side of the river is also perceived in other sides of the river. The strong environmental law of the European Union, with Habitats Directive and Water Framework Directive, should make from the outer borders of the European Union an example of environmental protection. But the field situation proves to be opposite, in Tisa, as well as other areas. In 2015 – 2016, the Romanian side of Tisa, from the banks to the floodplain, were destroyed by an obsolete river regulation project, financed from the Cohesion Fund. Multiple impacts, from disturbance of the flow matrix to diminished populations of protected species and stimulation of invasive species, affect the Ukrainian bank, while the impact further downstream is hard to assess.

Valorization of wastewater from the cork industry

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Portugal is renowned for its vast cork oak forest area, boasting the largest in the world. Covering approximately 719,900 hectares of land, these forests account for 34% of the global total for cork oak forests. This substantial expanse of cork oak forests in Portugal is primarily due to the country's favorable environmental conditions, including its Mediterranean climate and suitable soil characteristics. The cork oak (*Quercus suber*) is a species of oak tree that is native to the Mediterranean region, including Portugal. These trees play a crucial ecological role by supporting a diverse range of plant and animal species, contributing to the overall biodiversity of the area. Additionally, cork oak forests have significant economic importance.

The northern region of Portugal serves as the primary hub for the cork sector's industrial activities in the country. It is a highly concentrated area where a significant portion of the cork industry. According to the data, approximately 67.6% of cork preparation companies, 96.8% of cork stopper manufacturers, and 57.6% of other cork product manufacturers are located in this region. Wastewater valorization in the cork industry refers to the process of utilizing and extracting value from the wastewater generated during cork production and processing. Instead of treating the wastewater as a waste product and disposing of it, wastewater valorization aims to identify and implement strategies to maximize its potential benefits.

The utilization of wastewater from the cork industry for dyeing purposes presents several potential advantages. Firstly, it provides a sustainable approach to water management by recycling and reusing wastewater, reducing the demand for freshwater resources. This contributes to the conservation and efficient use of water, particularly in regions where water scarcity is a concern. Secondly, the wastewater from the cork industry may contain natural compounds and residues derived from the cork

extraction and manufacturing processes. These compounds can potentially act as natural dyes or dye enhancers, providing unique and eco-friendly coloring options for various textile applications. Furthermore, using wastewater from the cork industry for dyeing can help minimize environmental pollution. Instead of discharging untreated or inadequately treated wastewater into water bodies, which can have detrimental effects on aquatic ecosystems, the reuse of wastewater in the dyeing process ensures proper treatment and reduces the environmental impact.

In our study we evaluated the potential of two by-products from the cork industry, namely cork-cooking water and cork black condensate water, as natural dyes for textiles. Specifically, we tested these by-products as eco-friendly coloring agents for dyeing cotton (both organic and with a surface treatment) and wool fabrics. To assess the viability of these natural dyes, we subjected the dyed fabric samples to various washing conditions, including hot and cold water, and exposed them to natural light to evaluate color fastness. At the end of the study, it was observed that the fabric samples exhibited a different color compared to the controls in all cases. However, the best coloring performance was achieved with cork black condensate water when dyeing wool samples, resulting in a uniform dark brown color. These findings suggest that cork black condensate water has potential as a natural dye for wool textiles, offering a reliable and consistent coloring outcome.

Further research and optimization may be necessary to enhance the color fastness properties of the dyed fabrics and explore potential applications in the textile industry. However, it is important to consider potential challenges and limitations associated with the use of cork industry wastewater for dyeing. The wastewater should undergo appropriate treatment processes to remove any harmful substances or contaminants that may interfere with the dyeing process or pose risks to human health or the environment. Additionally, thorough testing and analysis should be conducted to ensure that the use of cork industry wastewater does not compromise the quality, durability, or safety of the dyed textiles.

Проблеми антропогенного забруднення водних екосистем полігонами для розміщення відходів

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Незважаючи на наявний прогрес у повторному використанні, переробці і утилізації відходів, полігони твердих побутових відходів (ТПВ) залишаються основним видом поводження з відходами у всьому світі.

Під час експлуатації полігону утворюється фільтрат – рідка фаза, що утворюється при захороненні ТПВ та внаслідок атмосферних опадів. Хоч кількість цієї рідини відносно невелика за об'ємом, вона містить забруднюючі речовини у високій концентрації. Якщо фільтрат виходить за межі полігону, його негативний вплив на водні екосистеми може бути суттєвим. У ряді випадків фільтрат настільки забруднював прилеглі поверхневі та підземні води, що вони переставали бути джерелами питної води.

У зв'язку із цим, процес розміщення, захоронення та рекультивації відходів повинен відбуватися згідно з нормативно-правовими процедурами як на державному, так і на міжнародному рівнях.

Виділяють кілька різних конструкцій об'єктів поводження з відходами, які мають різний режим експлуатації та, відповідно, різний ступінь стійкості. Це відкриті звалища, контрольовані полігони, інженерні полігони та стійкі полігони.

Відкриті звалища домінують за кількістю в багатьох країнах і характеризуються стихійним складуванням твердих відходів без планування чи механізмів контролю. Близько 70% країн світу використовують відкриті звалища як спосіб утилізації твердих побутових відходів.

Ці відкриті сміттєзвалища не мають належного інженерного проекту і, отже, не мають засобів захисту ґрунтових вод чи контролю дренажу. Ризики для навколишнього середовища, створені ними, необхідно оцінювати та досліджувати, щоб визначити заходи щодо закриття чи