

However, currently, about 25 species of luminous bacteria have been discovered [3]. Thereby, we want to pay your attention on the importance and relevance of continuing research in this area.

**Conclusions.** Research in bioluminescence and bioluminescent organisms has made phenomenal progress over time. From early discovery research into different areas of industrial application. Bioluminescence has found utility in various fields including medicine, biology, physics and engineering and led to exciting multidisciplinary science across all of them [1].

But, unfortunately, in the next couple of years, interest in studying the bacterial bioluminescence has decreased. With this scientific work, we want to show you that the widespread use of Lux-tagged bacterial bioluminescence and ATP-bioluminescence assays in the industry of Ukraine, the development of less known methods of application, as well as active research in this area, will solve many production problems, in particular, will optimize and improve hygiene control in production.

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**ENVIRONMENTAL ASPECT OF PAPER RECYCLING**

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**Introduction.** As known, paper is a very popular material, consisting mainly of plant fibers, and is widely used in virtually all spheres of human life and employment. But, at the same time, the use of paper raises a number of problems, including environmental ones. Paper has been one of the largest components of solid waste in landfills for many years. Despite the growing rate of paper

recycling, not all companies recycle waste paper, so approximately 40% of discarded paper ends up in landfills. As paper decomposes in landfills, it releases methane gas, which is 23 times more potent a greenhouse gas than carbon dioxide.

Therefore, due to the widespread use of paper and the imperfect paper waste management system, the system for managing this type of waste in Ukraine should be improved to reduce the negative environmental impact.

*The purpose of this study* is to investigate paper waste generation in Ukraine and to analyse paper waste recycling mechanism.

**Research Methods:** the following methods were used to study the problems of paper recycling in Ukraine: analysis of the problem of paper waste accumulation; argumentation to justify separate collection of paper waste, as well as statistical methods.

**Paper Waste Generation.** The paper itself, after it was used and could no longer be used further, is called waste paper. Paper waste can be a serious pollutant, as according to the World Conservation Organization (WWF), about 300 million tons of paper [1] are produced every day in the world, which is the main source of paper waste. According to the Ecological Movement "Green World"[2], about 5-6 million tons of household waste, which includes paper waste, are disposed of annually in Ukraine. So, it is possible to make an approximate calculation that Ukraine produces about 13-16 thousand tons of waste paper per day. Let's imagine that approximately 20% of this is burned, so we will get 10,400-12,800 tons of paper, which would simply pollute the territory or be thrown into the landfill. In the modern world, up to 40% of paper pulp is of wood origin [3] (in most modern factories, only 9-16% of pulp is obtained from lumber for pulp and wood pulp; the rest is from wood waste, which was traditionally burned before). 35% of all felled trees go to the production of paper products, which is 1.2% of the global volume of production. Recycling one ton of newsprint saves up to 1 ton of wood, while recycling 1 ton of printing or copying paper saves just over 2 tons of wood. Paper is also a serious pollutant. Although ordinary paper and cardboard decompose in 1-2 months, books or printed products can take up to two years. Also, the US Environmental Protection Agency (EPA) [4] found that recycling causes a 35% reduction in water pollution and a 74% reduction in air pollution compared to pulp production from wood. Pulp and paper mills can be a source of both air and water pollution, especially if they produce bleached pulp. Modern factories produce much less pollution than a few decades ago. Waste paper recycling reduces the demand for primary pulp from wood pulp, thereby reducing the overall amount of air and water pollution associated with paper production. Recycled pulp can be bleached with the same chemicals used to bleach pulp, or with hydrogen peroxide and sodium hydrosulfite as the most common bleaches. Recycled pulp, or paper made from it, is called chlorine-free if no chlorine-containing compounds were used in the production process. However, recycling can have harmful by-products, such as sediment waste.

**Paper Processing in Ukraine.** In Ukraine, waste paper recycling facilities are based in the settlements of Kyiv, Brovary, Boryspil, Baryshivka, Chernihiv, Kipti, Nizhyn, Kozelets, Nosivka, Bobrovytsa, Oster, Zgurivka, Yagotyn. The cost of waste paper recycling depends on many factors. To obtain a high-quality processing product, it is necessary to organize a smooth process. The higher the quality of the final product, the more expensive the processing process. An important role is played by the cost of the equipment used for processing. Paper processing in Ukraine is carried out by Kyiv Cardboard and Paper Mill, ZVPP "Region-2001"[5], "Vtorma"[6]. The enterprise "Vtorma" processes paper in the following way: the glue that connects the cellulose fibers into one whole is removed, then it is cleaned of impurities, then it is turned into a pure mass suitable for the production of paper and cardboard or any other application (refining).

### **Conclusion**

In our opinion, Ukraine needs to develop the field of paper processing, as it has a wide range of applications. It will also allow to significantly reduce the share of pollution and household waste. First of all, it is necessary to engage in environmental education, as well as create a paper sorting mechanism to minimize the unsorted percentage of paper that has been mixed with other waste. Then and only then will we be able to effectively collect paper, recycle it and not only cover our own needs, but also be able to sell it all.

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