USE OF GALLERIA MELLONELLA ECOBIOTECHNOLOGY IN PLASTIC DEGRADATION

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Galleria mellonella, the greater wax moth or honeycomb moth, is a moth of the *Pyralidae* family. *Galleria mellonella* is found throughout the world and is a common parasite of the bee family [1]. The use of large wax moth caterpillars is one of the promising options for solving this problem.

The purpose of the study is to analyze available scientific and patent sources regarding the possibility of implementing an ecological method of destroying plastic waste using *Galleria mellonella* larvae.

As a result of the analytical study, the scientific research and development presented in the scientometric databases *Web of Science*, *PubMed*, *Chemical Abstracts*, etc., in particular in the articles located in the full-text database *Sciencedirect*, were analyzed.

In [2], it was established that the rate of biodegradation of polyethylene by the caterpillars of the large wax moth is much higher than that of plastic-destroying bacteria. Phenoloxidase enzymes isolated from larval saliva can catalyze the oxidation of organic substrates. Wax moth larvae easily gnaw through polyethylene and polystyrene films - their jaws are powerful. A hundred caterpillars can destroy 92 mg of polyethylene in 12 hours. Unfortunately, on pure polyethylene, as well as on pure wax, caterpillars are not able to maintain their vital activity, they need the remains of bee cocoons and other edible organic matter. However, the high fecundity of the moth and the ability to reproduce year-round will easily ensure the possibility of obtaining a biologically active product on an industrial scale. Thanks to the cheapness of the used nutritional substrate for moths, a low cost of rearing larvae can be achieved. In addition, the development of special equipment is not necessary for the reproduction of insects [1]. According to the approximate estimates of the Ministry of Agricultural Policy for 2021, there were about 400,000 beekeeping farms in Ukraine that kept 4 million beehives [3], so Ukraine has real resources for growing wax moth larvae. It is expedient to implement a State program for monetary compensation for beekeepers who agree to grow wax moth larvae and use plastic splitting technology in cooperation with environmental scientists working on this issue. Thus, there is a real prospect of solving the problem of plastic recycling in the near future not only in Ukraine, but also in Europe.

References:

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