An Innovative Method of Assessment the Degree of Transformation of Land Ecosystems

Nerush, Ruslan (School: Mariupol Technical Lyceum)

The anthropogenic impact on the biosphere is constantly increasing affecting ecosystems, reducing species diversity and lowering the rate of biomass formation. Normally determining the impact of various factors on the ecosystem requires complex and costly research with a permanent human presence. To solve this problem, I developed a platform based on the remote collection of data on the dynamics of certain background groups of animals and subsequent software processing of the obtained data. The platform consists of two parts - a monitoring kit and software. The kit is equipped with an autonomous multi-functional camera and a brightly colored background with a bait compartment. Invertebrate animals are attracted by the bait, the camera takes photos/videos and stores them on a memory card. Shooting is possible both with the help of motion sensors and with a timer, the process can be controlled from a smartphone or PC. Then my program processes the data and calculates the main indicators of α- and β-diversity. Referring to the value and dynamics of these indicators, we can calculate a single index of ecosystem transformation, which values are represented by the condition scale. Also we can compare the diversity of two ecosystems. During the field tests I used representatives of the Carabidae family as background monitoring objects. Studies have shown the high efficiency of this method in almost any land biocenosis. This method can be used by environmental organizations, monitoring services, educational specialists and students in any environmental and/or faunal research. Patent pending.