

NEW SCIENTIFIC APPROACHES TO ENVIRONMENTALLY FRIENDLY PEST MANAGEMENT

*N. Voronova, R. Shulinski, Y. Bandarenka, e-mail: nvoronova@bsu.by
Belarusian State University (Minsk, republic of Belarus)*

The biodiversity decline is a global warning trend which can be observed all over the world for the last 50 years. In the frame of this process the most unsettling phenomenon is a rapid decrease in the number and biomass of pollinators, which can lead to dramatic consequences as the flowering plant production is a very important part of the human food consumption.

Decline in the number of pollinators is believed to have several different reasons, but in many aspects, it is connected with an active insecticide usage during the last decades. Being not selective, modern insecticides cause severe damage to any insects in contact with plants, including beneficial ones, as well as water and soil organisms, predators, birds, fish and small mammals. In the light of CDB, all efforts of scientific communities and manufacturers should be directed towards developing new environmentally friendly approaches to control pests without damaging beneficial insects and other animals.

Biological selectivity of the insecticides is a very complex goal to achieve, because of the high plasticity of insect detoxification system and the common nature of detoxification enzymes in insects and other animals. For this reason, alternative methods of pest control such as, for example, bacterial symbionts management, biological agents releasing (parasitoids), pests' genome editing, etc. are coming to the front of the scene. However, today these new approaches are still remaining experimental but with a big potential for the future. The possible obstacles on the way of their development are, primarily, evolutionary plasticity of phytophages and their complex mutual relationships with endosymbiotic bacteria, which can influence pest resistance to temperature shock, insecticides and parasitoid pressure.

Studying aphid's hologenome, including all bacterial symbionts and all pull of genes involved in the process of detoxification, we suppose, can only give us a key for the building new tools for controlling aphids in open fields.