Study of Edible and Medicinal Mushroom Viral Diseases

Olga A. Boyko
Taras Shevchenko Kiev National University, 64 Vladimirskaya Str., Kiev 01033, Ukraine

In this report the cultivation of healthy mushrooms using biotechnological processes and the circulation of pathogenic viruses in natural ecological niches are discussed. For long-term research five strains of mushrooms of the genus Agaricus [A. bisporus (J. Lge) Imbach—4, 36; A. arvensis Schaeff.—14; A. campestris L.: Fr.—144; A. bitorquis (Quel.) Sacc.—285], and Pleurotus (P. ostreatus (Jacq.: Fr.) Kumm.] were used. It is shown that Agaricus, which is cultivated using special technologies, is especially sensitive to viruses.

Our findings, in biotechnological centers of Ukraine, on the problem of infected A. bisporus show that the disease brings about small fruiting bodies that are often waterlogged and dark brown.

Mushroom (Agaricus bisporus and Pleurotus ostreatus) viruses can be spread from crop to crop in two basic ways.

Three morphological groups of viruses from Agaricus are described: rodlike (150–295 x 18 nm), bacillar (18 x 52 nm), and “spherical” (32 nm). Viruses are identified as in mycelium (sowing material) and in fruiting bodies. In some strains of Agaricus they reduce a crop by 1.5–3 times. The sensitivity of plants to the rodlike virus, which by electron microscopy, Uhterloni diagnostics, IFA, was identified also in soil and feces of animals, is investigated. For diagnosis of viral diseases of Agaricus a key circuit is developed that includes an estimation of diseases in mycelium and fruiting bodies of mushrooms by visual inspection and modern tests.

It is shown that certain homogeneous fractions of Agaricus have a stimulating action on agricultural plants.

It is demonstrated that Pleurotus mycelium and fruiting bodies are sensitive to the quality of nutrient environments, such as compost. For formation of the latter it is necessary to select grain and straw undamaged by chemical weed killers, to support a light and temperature mode. Pleurotus can catch a virus of “spherical” morphology.

As research has shown, for Agaricus and for Pleurotus the mixed infections of viruses, bacteria, and microscopic mushrooms are especially harmful.

On the basis of the results of experience, a technology of cultivation of healthy mushrooms is offered that includes preventive methods and economic parameters in all processes.