STUDYING OF MICROMYCETES SPECIES STRUCTURE OF GRAIN USED FOR PREPARATION OF *AGARICUS BISPORUS* (J.E.LANGE) IMBACH SPAWN

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Micromycetes species structure of grain for Agaricus bisporus (J.E. Lange) Imbach spawn production was studied. It was shown that grain is a potential origin of disease agents of champignon spawn. It was species of genera Absidia, Alternaria, Penicillium and Trichoderma.

Key words: micromycetes, grain, champignon, spawn, spawn diseases

Technology of champignon cultivation (*Agaricus bisporus* (J.E. Lange) Imbach) still is improving, but mushroom cultivation in specialized rooms is similar to monoculture of any agriculture crop.

It is known about 75 specialized mushroom farms in Ukraine that exchanging by spawn. It leads to distribution of infection and low quality of champignon fruit bodies caused by different pathologies.

Spawn quality plays an important role for high yields of champignon fruit bodies.

Today, grain of wheat, millet, rye, oat, barley, corn and rice is used for mushroom spawn preparation. The main demands to it are: free from fungal and bacterial diseases and its preparation has to be according to technological order. Advantage of grain spawn is: one seed – one germination place; easily using; absence of diseases and pests.

Pure culture of edible mushroom is necessary and obviously condition for its successful storage, reproduction and industrial cultivation.

Pure cultures contaminated by fungal and bacterial infection can't be used for compost inoculation. Its late detection leads to intensive infection development in the substrate and on champignon fruit bodies and to harvest losses. One gram of rice contains above 50 000-100 000 CFU of bacteria, more than 200 000 of actinomycetes, 12 000 spores of fungi and large number of yeast cells. Thus, sterilization has to destroy more than 300 000 antagonistic-cells per 1 g of grain. It is clear that number of such organisms at shot period will become astronomic at insufficient sterilization and presence of moisture. First of all it is about bacteria that are able to double its number every 20 minutes at room temperature.

Usually ways of spawn infection is grain, contaminated equipment, rooms and uniform. The main infection origins could be personnel, air, nutrient media, equipment, mushroom culture.

Material and methods. Object of our researches was studying of micromycetes species structure of wheat and rye grain using for champignon spawn preparation.

Biological method was used for fungal isolation. Grain was planted on PDA medium (potato-dextrose agar) and wet chamber, and incubated at 25±2°C for 14 days.

Spawn contamination was studied by inoculation of PDA medium by seeds with *A. bisporus* mycelium. Incubation was at 25±2°C for 7 days.

Morphological structures of micromycetes species was studied with light microscopy ("Axiotar Plus" (Zeiss, Germany)) and identified with using of national and foreign manuals.

Dispersion analysis was done with Microsoft Excel program.

Results and discussion. Significant colonization of wheat and rye grain by micromycetes was found, 55,0 and 79,5% accordingly. Disturbance at

growing and storage technology could be a reason of grain contamination by fungi.

Totally, 14 species of micromycetes were isolated from wheat and ray grain. Fungi of genera *Alternaria* Nees and *Penicillium* Link were the most represented. Competitors of champignon spawn were identified among of species isolated. It was representatives of genera *Alternaria*, *Penicillium* and *Trichoderma* Pers. Grain of rye was considerably contaminated with bacteria and *Alternria* fungi 9,0 and 65,5%, accordingly, that were agents of black spawn mould. Wheat grain was characterized by *Penicillium* species colonization (25,0%) that known as agents of green mould.

Identified micromycetes species had negative influence on spawn development. Grain of both crops was colonized by *Trichoderma* – an agent of green mould, 1,0 and 0,5% accordingly.

Micromycetes *Alternaria alternata* (Fr.) Keissl., *Penicillium verrucosum* Dierckx, *Papularia* sp. were isolated from spawn samples of own production. This species were characteristic to grain mycobiota which was used for champignon mycelium preparation.

Researches results have shown survival spores of penicillia after grain sterilization. Contamination of spawn by *Penicillium* species fluctuated from 1,0 till 65,0%.

Genus *Absidia* Tiegh. was identified among of micromycetes from wheat grain. Its representatives belong to thermotolerant species and are known as contaminants of microbiological laboratory. Negative influence on champignon mycelium growth was observed at presence of *Absidia* sp. Development of fuzzy white mycelium not characteristic for champignon was found in bags with *Absidia*. Such bags were removed.

Number of bags with contaminated spawn was 15-20% in parcel that complicated timely mycelium preparation.

Thus, grain for spawn preparation was a potential origin of micromycetes – agents of champignon mycelium diseases and damage. It was species of genera *Absidia, Alternaria, Penicillium* and *Trichoderma*.

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