

STUDY OF THE AGARICUS BISPORUS STRAIN A-15 GRAIN SPAWN OBTAINING METHOD

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Introduction. The basidiomycetes species *Agaricus bisporus* cultivation relevance is their high nutritional value. Chemical studies show that the mushrooms have a large amount of easily digestible nutrients. Due to the high content of proteins (64.66 % of the total proportion of PFC (the ratio of proteins, fats, carbohydrates)), mushrooms can be compared with the meat quality. Mushrooms contain 18 amino acids of the known 22. The mushrooms benefit is that they also contain no less important for proper functioning of the human fats and carbohydrates (1 gram of fat and 0.1 gram of carbohydrates in 100 g fruiting bodies). The quantity of minerals and vitamins (percentage daily intake per 100 grams: vitamin B2 25 %, vitamin B5 - 42 %, vitamin PP - 28 %, potassium - 21.2 %, phosphorus - 14.4 %, iodine - 12 %). Mushrooms are similar to the fruit, and the phosphorus content brings them to several types of animal products such as fish. Japanese researchers found that the mushrooms in high quantities amino acids such as lysine and arginine that have a beneficial effect on the development of mental abilities and memory. The protein from fungi is digested for 70-80%. Thus, the mushrooms chemical composition shows that their nutrients content is not less than the other necessary for complete nutrition products, and certain nutrients in the mushrooms are even more. The mushrooms biological value the high minerals, vitamins, essential amino acids content. Physiological value is due to the presence of BAS (biologically active substances) of the antibiotic nature, and extractive substances that promote gastric secretion.

Mushrooms have medicinal properties. Mushrooms can purify the body, remove heavy metal salts. Also the mushrooms consumption can reduce cholesterol level and prevent atherosclerotic plaque formation. Studies shown that people who frequently consume these mushrooms blood cholesterol is below 34% compared to those who do not eat mushrooms. Therefore the risk of developing heart attack and atherosclerosis reduces. Low caloric value mushrooms can be used in various slimming diets. While a person does not lose the necessary vitamins and other nutrients. The healing properties are preserved in the dried mushrooms. They can be consumed to those who have stomach ulcers and hepatitis.

Methods of biotechnology allow to obtain high yields of this valuable food product.

Aim. The aim of this work is to study the *Agaricus bisporus* mycelium cultivation technology and growth speed in order to obtain grain spawn.

Materials and methods. The object of the *Agaricus bisporus* strain A-15 mycelium, which was isolated from compost mycelium of commercial production. Research methods - cultural, microscopic, and photographic documentation of the obtained results.

Results and discussion. When mushrooms are grown up compost or grain spawn are used as a seed material. Grain spawn is a boiled and sterilized grain, developed by pure culture of the fungus. Grain mycelium is suitable for most fungi reproduction and also has a good nutrients supply. Compost mycelia is compost (the result of biological oxidation of the mixed organic materials with added to them mineral substances such as phosphorus, nitrogen), seeded with mushrooms mycelium, obtained in an artificial environment. The fungus strain A-15 matrix culture was obtained in laboratory conditions on the Wort agar medium and its morphological and cultural characteristics were studied. It was established that the mycelium hyphae appearance is like a fluffy thread of white color. The structure of the mycelium is in the form of hyphae growing in a chaotic direction, hyphae have septate structure. The mycelium has an active grows at $(24-26)^{\circ}\text{C}$ on Sabouraud and wort agar. The growth rate of mycelium, which was determined by linear measurement, is 1.5 cm/day.

The grain spawn preparing method is consists of several stages.

You must boil the grain (wheat or another cereal culture) with its subsequent drying. Add gypsum and chalk to control pH and prevent grain adhesion. Prepared grain is placed in 0.5 l capacity and is sterilized at 0.5 atm pressure and 121°C for 20 min.

The prepared substrate is inoculated by the mushroom pure culture. Cultivation should be carried out in the dark at ambient temperature $(24-26)^{\circ}\text{C}$ to fully exploit substrate by the mycelium. During cultivation of container-growing mycelium periodically review is needed. When green, brown or orange fungal contaminants at the grain stains are detected, such containers should be immediately removed from the thermostat for repeated sterilization in the autoclave at a pressure of 2,0-2,5 atm for two hours. After receiving the mycelium should be stored at a $(4-5)^{\circ}\text{C}$ for 6 months (optimal retention time is 3-4 months).

Conclusion. As a result of the work in the laboratory condition the *Agaricus bisporus* strain A-15 mycelium pure culture was obtained on the solid nutrient medium, and the method of grain spawn obtaining was studied. This practice opens the prospects for further laboratory research in the field of basidiomycetes cultivation for the optimal grows conditions, storage time and the yield of mycelium identification and the isolation and the biologically active metabolites activity estimation methods selection.