С помощью разработанных методов было проведено молекулярно-генетическое тестирование выборок свиноматок пород ландрас (n = 76 гол.) (табл. 1), йоркшир (n = 33 гол.) по локусам генов BF, NCOA1 и LIF. Статистический анализ проводился с использованием программ Microsoft Excel (Microsoft Corporation, США) и SPSS v.20.0 (IBM, США). Уровень статистической значимости p при множественных сравнениях вычислялся экспериментально для каждого конкретного случая (сравнения) с использованием точного критерия Фишера. Для сравнения количественных данных после проверки на гомоскедастичность (тест Левена, Levene test) и нормальность распределения (критерий согласия Колмогорова) использовали метод ANOVA.

Анализ ассоциаций исследованных полиморфизмов генов выявил, что животные породы ландрас с генотипом LIF^{BB} являются предпочтительными по таким показателям, как количество рожденных и рожденных живых поросят; предпочтительным генотипом по показателю масса гнезда при рождении является $LIF^{AB/BB}$; по показателю крупноплодность предпочтительным генотипом является LIF^{AA}. Это обусловлено отрицательной корреляцией данных признаков между собой, как правило относительная живая масса каждого поросенка уменьшается пропорционально их количеству в гнезде. У животных породы йоркшир достоверных различий между генотипами свиноматок и их воспроизводительными признаками по гену LIF выявлено не было и соответственно не выявлены предпочтительные генотипы, что может быть связано с недостаточной выборкой животных. В нашем исследовании показана тенденция, увеличения живой массы гнезда в 21 день, так называемой молочности (p = 0,054) и массы 1 головы в 21 день (p = 0,098), у животных породы ландрас с генотипом BF^{BB}, который может быть предпочтительным по данным показателям. Достоверных ассоциаций между разными генотипами гена NCOA1 и показателями воспроиз-водительных качеств свиноматок пород ландрас и йоркшир не было выявлено, что может быть связано как с недостаточной выборкой, так и с особенностью генома в результате селекции данной популяции, что не дает возможность использовать ген NCOA1 в качестве маркера воспроизводительных качеств свиней в исследованных выборках.

УДК 582.288:581.92

ECOLOGICAL IMPORTANCE OF *TRICHODERMA* SPP. AND THEIR SECONDARY METABOLITES FOR ORGANIC FARMING

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Summary. *The development of organic farming around the world and in Belarus in the last 10–15 years has shown the importance of studying and introducing biological methods for combating plant diseases. For this, studies of various microorganisms are carried out throughout the world, which can become the basis for modern plant protection products that do not damage the environment and human health.The widespread occurrence of fungi of the genus Trichoderma attracted our attention due to the possibility of isolating and studying them to identify new highly active strains with a protective function, as well as useful for agriculture. For example, many people, including my family. are engaged in composting plant residues in order to obtain organic fertilizer. Adding Trichoderma to such a compost would speed up its maturation and also give it the property of a plant protection product.*

Therefore, the goal of our work was to create a collection of *Trichoderma* strains of various origins and conduct a comprehensive study of it in order to select isolates that are most promising for crop production.

We have used a number of standard microbiological methods to locate, isolate, collect, maintain and preserve isolates of *Trichoderma* fungi. We also used special published methods to describe isolates and study their special characteristics: growth rate on various substrates and under various other conditions, the ability to release secondary metabolites, antagonism towards phytopathogenic fungi.

As a result of the experimental work, we have created a collection of fungi of the genus *Trichoderma* and described it according to different parameters. We have also identified the most promising isolates for creating a biological plant protection product.

The scientific novelty of the work lies in the collection and study of new, previously unexplored *Trichoderma* isolates. The practical and economical significance of the work lies in the collection and assessment of a wide range of *Trichoderma* isolates for some important economic traits, which can be used in various directions, for example, to protect plants from diseases and stimulate their growth.

Based on the data obtained during the execution of the work, we can draw the following conclusions:

1. Well-decomposed wood, fruiting bodies of mushrooms, as well as the soil are inhabited by mushrooms of the genus *Trichoderma*. The fruiting bodies of the present tinder fungus are the richest source of a variety of fungi of the genus *Trichoderma*.

2. The created collection of *Trichoderma* isolates has a significant diversity in the morphological characteristics of the mycelium. The distribution by morphological groups is heterogeneous.

3. The collection contains both slow and fast growing isolates. At the same time, the growth rate of mycelium in isolates differs depending on the period from

the beginning of growth. Isolate 35 has the highest growth rate, which is not inferior in this indicator to industrial strains from commercial preparations.

4. Isolates in the collection exhibit a different capacity for cellulose utilization. The best growth rate on the medium with cellulose was shown by isolate 22, which is not inferior to isolates from commercial preparations.

5. Wood, fruiting bodies of fungi, as well as soil are inhabited by fungi of the genus *Trichoderma*.

6. Some isolates from our collection are capable of synthesizing siderophores.

7. Many isolates are capable of inhibiting the growth of soil pathogens. Perhaps this is due to the fact that fungi of the genus Trichoderma are soil fungi. The pleasant result was that Trichoderma suppressed phytophthora well.

8. The growth of isolates at a temperature of 37 degrees Celsius shows the impossibility of using such isolates for the needs of crop production.

The main practical conclusion is the creation of a prototype of a commercially viable biological product that can be widely introduced into the practice of organic and conventional farming through its commercialization.

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УДК 338

毛发宏扫描全息分析系统

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Summary. *The existing disease diagnosis techniques are more or less harmful to the human body, so a simple and non-invasive disease screening technology is urgently needed. This paper introduces a hair scanning technique for the diagnosis of diseases.*

Anatomically, human scalp hair is divided into thalamic layer, cortex and medulla. The medulla is located in the center of the cortical fibers and can be missing, broken or continuous. Existing studies have found that the thalamic layer and cortex of hair have different functions and functions. However, the hair medulla is simply considered to be an irregular gap with many holes in the center of the hair, and the research on the function and function of the medulla is not satisfactory. It can be used as a diagnostic tool to study whether changes in the medulla structure of hair are related to some diseases. Scanning hair samples can