After analyzing some of the methods, namely: test strips, drip method, special instruments, it was decided to use the test strip method as the most effective and affordable way of measuring nutrients in a closed water environment.

Using the library of computer vision algorithms, image processing and numerical algorithms of OpenCV implemented in Python, the test strip will be taken before immersion, after immersion, and directly comparing the results. OpenCV 3.0 with Python 3 support was chosen for this project. in this version of the library was added a huge number of new features, improving performance and stability in comparison with previous versions.

The camera installed under the aquarium lid will shoot the test strip before dipping into the water. The test strip will be secured using a holding mechanism driven by a stepping motor. At the end of sixty minutes, the camera will re-shoot and send data to the computer, where the results will be compared, the difference in the colors of the test strip before diving and after, and the calculation of the required amount of nutrients.

The system is based on Raspberry Pi 3B +. Raspberry Pi is a single-board computer on the architecture of a 64-bit ARM processor. The microcomputer is part of the managed system. The managed system, being a part of the remote control and access system, provides a higher speed of data acquisition and reaction to changes. A plus is the local configuration of both systems at once.

Advantages such as compactness, stability, a large number of documentation and compatible components, price and cross-platform make Raspberry Pi an ideal candidate for the platform of the management system.

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STUDYING THE INFLUENCE OF FOOD FRAGRANCES ON CELL CULTURE NEK 2937

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The topic of food additives is very relevant in our time. Today, almost no food, no matter where food additives are used. They surround us in everyday life, we consume foods, but do not know what impact they can have on the body. In my term paper, experimentally, I wanted to show the effect of flavoring on the cells.

Keywords: food additives, food safety, flavors, dyes, cell cultures, culture media.

The topic of food additives is very relevant in our time. Today, almost no food, no matter where food additives are used. They surround us in everyday life, we consume foods, but do not know what impact they can have on the body.

Tasks to be solved:

– choose the method of staining the cell culture after removing the experience;

– determine the viability during cultivation;

– determine the mitosis-inducing ability of food flavoring.

Materials and methods

The study material was food flavoring (AROMA: PINEAPPLE 31524A). To study the action of food flavoring used cell culture HEK 2937.

As a result of the studies, an appropriate protocol of experiments was selected, including reseeding, cultivation, staining and fixing the cells and establishing cell viability when cultured on a nutrient medium with the addition of flavoring (AROMA: PINEAPPLE 31524A) in concentrations of 0.5 μl, 1 μl, 1, 5 μl. Cell counting at the stage of mitosis was performed using a Nikon 50-i fluorescence microscope.

Results

The first stage of our work was the establishment of cell viability, when cultivated on a nutrient medium with three concentrations of flavors 0.5 μl, 1 μl and 1.5 μl of flavoring. The results obtained after counting in the

Goryaev chamber were: 87 x 104 cells / ml (92.5%), 47, x 104 cells / ml (86.87%), 85.25 x 104 cells / ml (96.86%) respectively. The viability in the control culture was 62.15 x 104 cells / ml (95.76%).

On cell viability Processing data showed that the predetermined concentration of the flavoring (0.5 l, 1 l and 1 l) do not cause a statistically significant effect on cell viability both in cell culture for 24 hours and 3 days under conditions of normoxia.

Further, the mitosinducing ability of food flavor in concentration used in beverages was established by experiment. It was found that a statistically significant effect on cell viability in mitosis and the number of necrotic cells studied concentrations does not cause both flavor when cells are grown within 24 hours, and - 3 days. The concentration of 1.0 μl, compared with other concentrations, stimulates cells to mitotic division.

Thus, it has been shown that the recommended concentrations of the flavor for the beverage do not have a mitotic effect on the HEK 2937 cell culture for a predetermined time.

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PRACTICAL ISSUES OF AUTOMATED IRRIGATION SYSTEMS ESTABLISHMENT

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The study of technologies of industrial automated irrigation systems usage was carried out in order to establish the automatic irrigation systems for climatic conditions of the Republic of Belarus on the basis of Arduino microcontrollers.

Keywords: automatic irrigation systems, plant growth conditions, base substrate, Arduino microcontrollers, humidity sensor, temperature sensor.

The relevance of the development of automated systems of maintenance of plants living in confined conditions: containers, pots, soilless substrate, implying the ability to remotely start, is dictated by modern trends in greening cities, modern approaches to landscape design and the requirements for greening roofs. The use of automated systems allows economical use of resources such as water and electricity, as well as fertilizers necessary for plants.

The majority of automated irrigation systems established in the Republic of Belarus don't take into consideration the peculiarities of the climate in the country and the peculiarities of plant vegetation that are connected with it. Such systems are for the irrigation of large areas in order to increase crop yields or for the park zone irrigation. Generally they are used in the manual control mode.

Such systems are not for the irrigation of elite plants which usually need individual approach. The measure and humidity level control of base substrate and the ambient temperature are the key factors for this approach.

In our system control is carried out by humidity and temperature sensors. The Arduino microcontrollers software runs the irrigation control with the help of switching states of valve connected to the system.

This work solves following problems:

- study of the problem of life support of plants living in limited conditions;
- studying the tools and technologies for automation of the life support systems of plants;
- study of similar plant care automation solutions;
- the development of automated system of maintenance of plants living in confined conditions.