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Determination Of Phytoncidal Activity Of Plants

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ABSTRACT
Modern technical means are unable to provide a healthy air environment. On the contrary, indoor air conditioners are often sources of increased microbial contamination. At the same time, volatile secretions of many plants are able to effectively suppress the vital activity of microorganisms. The relevance of the work is to find environmentally safe and effective means of improving the air environment. To do this, it is necessary to study the phytoncidal activity of plants. An experiment was conducted to check which plant species produce more phytoncides. The practical significance of the work is determined by the possibility of using the results obtained to improve the composition of the air around us. Plants with high phytoncidal activity should be used in landscaping of residential premises and urban areas.
Keywords: Phytoncide activity, vitamin-like substances, atmospheric vitamins

Introduction

The release of phytoncides is increased when plants are damaged. The chemical nature of phytoncides varies. Usually, it is a complex of compounds – glycosides, terpenoids, tannins, etc., the so-called secondary. metabolites that do not belong to the main classes of natural compounds – proteins, carbohydrates and fats. A distinction is made between non-excretory phytoncides of cell protoplasm ("tissue juices") and volatile fractions emitted into the atmosphere, soil, and water (in aquatic plants). Volatile phytoncides can exert their effects at a distance. The potency and spectrum of antimicrobial action are very diverse in different plant species. In garlic, onions, horseradish, many species of protozoa, bacteria and lower fungi are killed in the first minutes and even seconds. (Tokin B. P., Phytoncides, 2nd ed., Moscow, 1951).

Literature Review

Volatile phytoncides of higher plants were first discovered in 1928-1930 by A.G. Filatova and A.E. Tevakina. The essence of the main discovery, which turned out to be the starting point in the consciousness of the biological doctrine of phytoncides, was that higher plants, when wounded, produce volatile antimicrobial substances. The term phytoncides was proposed by the Russian scientist B.T. Tokin in 1934 to designate volatile substances with antimicrobial properties that are secreted by plants. B.

In 1928, P. Tokin described an interesting observation: if you apply a slurry of crushed onions or garlic to a glass slide, and next to it a drop of water in which ciliates float, then in a few minutes the cells will die. Similar experiments have been carried out with many plants and various microorganisms, and the result has been repeated to a greater or lesser extent. Academician N. G. Kholodny suggested that volatile substances emitted by higher plants and found in the air around us are "atmospheric vitamins" or "vitamin-like substances" that can be absorbed by the human lungs and have a beneficial effect on his body.

In the experiment, the phytoncidal activity of geranium (*pelargonium*), chrysanthemum (*chrysanthemum*) and meadow mint (*menthe arvensis) plants was studied*. Four jars were taken, in each of which an egg was boiled and crushed, placed in jars, and covered with a breathable cloth. On the cloth, they were placed, crushing from 5 grams of the leaves of the above three plants. The 4th jar is a control jar, geraniums are put in the first jar, chrysanthemum in the second and meadowmint in the third. They were observed for 8 days. The results are shown in the table (Table-1).

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Outcomes

Table-1
Phytoncidal activity of plants

	Geranium vulgaris	**Chrysanthemum**	**Meadow mint**	**Control Jar**
Day 1	There are no changes	There are no changes	There are no changes	There are no changes
Day 2	There are no changes	There are no changes	There are no changes	There are no changes
Day 3	There are no changes	There are no changes	There are no changes	There are no changes
Day 4	There are no changes	There are no changes	There are no changes	a slight rotting smell, pink spots have formed
Day 5	It has acquired a pale pink color, the smell of mint has weakened	slight rotting smell, pink spots formed, slightly melted	a slight rotting smell, pink spots have formed	Medium rotting smell, blue spots formed, partially rotten
Day 6	a slight rotting smell, pink spots have formed	Medium rotting smell, blue spots formed	Medium rotting smell, blue spots formed, partially rotten	Strong rotting smell, the egg has begun to decompose
Day 7	Medium rotting smell, blue spots formed, partially rotten	strong rotting smell, covered with blue spots, partially rotted	Strong rotting smell, the egg has begun to decompose	strong rotting smell, the whole part of the egg has decomposed


Fig.1. First day of observation Fig.2. Last day of observation

Discussion

During the study of the rate of egg splitting during 8 days, the egg of the 4th jar was the first to change its color, since it did not contain phytoncides. For the first 4 days, no changes were observed in the 1st, 2nd and 3rd banks. On the 5th day, the changes began. On the last day of the experiment, we saw that 4 jars were covered with mold fungi (Fig. 2), and the inside of the egg was already split. Jars 2 and 3 had a strong rotting smell and the inside was covered with blue and green spots. 1- A jar of geraniums showed the least egg rot and a medium rotting smell

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Conclusion

Different plant species exhibit different phytoncidal activity. The results of the experiment showed that, among the studied plants, geranium has a relatively good phytoncidal activity. It has been determined that the phytoncidal activity of mint is inferior to chrysanthemum. Organic substances without the influence of phytoncides are quickly decomposed and rot.

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