difference in the fact that the vascular network is not an open system and the arteries pass into capillaries and then into veins. But based on the fact that the capillary network is not visible in most images, this point is neglected. The parameters differ in indicators and it is quite difficult to predict exactly how the separation of branches will occur. There is also a difficulty in reproducing the model of the vascular network. The ratio between the diameters of the three vessels that make up the bifurcation system and the angles that the two branches form after leaving the main vessel can be compared with the parametric L-system. To determine the fractal dimension, the "box counting" method is used. It determines the degree of filling of the space with the vascular network.

Results and discussions. In the case of symmetrical branching, the diameter of each of the vascular segments decreases uniformly with the course of branching by about 20%. On both vessels that branch dichotomically, the diameter will be the same. If the bifurcation is asymmetrical, the diameter of the main vessel changes by about 0.3%. According to the course of such a vessel, the blood flow rate is maintained. There are also mixed vascular systems, where both symmetrical and asymmetric vascular separation occurs at different segments.

Conclusions. An important question is whether there is a pattern in the branching of blood vessels, or it is a random process. It is also important to confirm or deny whether vascular systems are really fractal systems.

PROSPECTS FOR THE USE OF BIOINSECTICIDES IN AGRICULTURE

Pereverzeva A. S., Kaliuzhnaia O. S.
Scientific supervisor: Strelnikov L.S.
National University of Pharmacy, Kharkiv, Ukraine
aliona.pereverzeva@gmail.com

Introduction. Insecticides - are chemical or microbiological preparations for pest control. Bioinsecticides or microbial pesticides contain spores or vegetative mycelium of insect pathogens and / or products of their activity. This is a topical issue today because agriculture is affected by insect pests, but the use of chemical insecticides has a negative impact on the environment and human heal

Aim. In this paper, we consider the relevance of the use of biological insecticides against plant pests, and their advantages over chemicals.

Materials and methods. The method of descriptive research was used - the literature and sources available on the Internet were analyzed.

Results and discussion. Organochlorine and organophosphorus (to a lesser extent) insecticides have a harmful effect on humans, animals and the ecosystem. This effect can be manifested immediately or over a long period of time. Organochlorine compounds are stored in the environment for 15 to 20 years and constantly accumulate. Bioaccumulation of chemical insecticides in adipose tissue of many organisms has already led to fatal consequences. Thus, in North America, where about 50 million hectares of land were treated with chemical insecticides, peregrine falcons, quail hawks, bald eagles, brown pelicans, and eared cormorants have practically disappeared. In addition, over time, insects become more resistant to many chemical insecticides, and therefore it is necessary to constantly increase their number to control insects. Bacillus thuriengiensis (Bt) is a gram-positive spore-forming bacterium, which is the most effective and studied microbial insecticide. They are represented by many strains and subspecies (subsp.), And each of them synthesizes a toxin specific to certain insects. The advantages of Bt-based bioinsecticides over chemical insecticides are the absence of contaminants, high specificity of action, which determines their safety for non-target organisms, and relatively low cost of procedures

required for their registration as plant protection products. However, they have a number of disadvantages, in particular, a relatively narrow range of action, too short a lifetime, high cost, which does not allow them to become a full-fledged alternative to chemical insect control agents. Various approaches are used to overcome these shortcomings. For example, reducing the cost of bioinsecticide production can be achieved and is achieved by optimizing the conditions for growing bacteria and using cheaper nutrient media. To increase the duration of action of insecticidal Bt proteins, special additives are added to the formulations. To increase the effectiveness and / or expand the spectrum of insecticidal activity construct strains Bt containing certain combinations of determinants of crystalline proteins. About 60 subspecies of Bacillus thuriengiensis have been described so far. Different strains of Bt differ significantly in the spectrum of insecticidal action and toxicity of their crystalline proteins. This is due to the large variety of δ-endotoxins synthesized by different strains of Bt, and the production in cells of one strain of parasporal inclusions containing several different insecticidal proteins. For example, B.thuriengiensis subsp. kurstaki is toxic to scale pupae, thick-headed, mermitid and caterpillars of spruce buds. B. thuriengiensis subsp. israelensis kills dicotyledons: mosquitoes and flies, etc. Bt-based drugs are available in many countries around the world. They have different commercial names: entobacterin, dendrobacillin, dipel, turicide, agritol, bactan and others.

In Ukraine, in the Vinnytsia region, there is a plant of microbiological synthesis drugs "Enzyme", which produces bioinsecticide "Bactoculicide" - a sporocrystalline complex containing delta-endotoxin of entomopathogenic spore bacteria Bacillus thuringiensis var. israelensis, which is formed during the fermentation of the culture. The drug is an intestinal poison for the larvae of all types of mosquitoes. The toxin, getting into the body of larvae with food, causes digestive disorders, toxicosis and death.

Conclusion. Thus, research has shown that one way to solve the problem of creating effective and environmentally friendly drugs to control insects is the use of bioinsecticides, such as recombinant strains based on Bacillus thuriengiensis.

SKIN MICROBIUM AND ITS INTERACTION WITH THE ENVIRONMENT

Soloviova A.V.
Scientific supervisor: Kaliuzhnaia O.S.
National University of Pharmacy, Kharkiv, Ukraine
soloviova.alina@gmail.com

Introduction. The microbiome of human skin plays an important role in homeostasis and the protective function of the skin. An important role in the formation of the microbiome of human skin is the environment, because it is in constant interaction with the skin, for example through washing, hygiene habits and else. Identification of normal and pathogenic microbes and determining their relationship with the host, will help to decipher their functions in healthy skin, as well as in dermatological diseases.

Aim. The skin microbiome plays an important role in the skin barrier function, so it must remain dynamic, adapt to changes in the environment that occur in different parts of the body throughout life. The purpose of the work is to determine the factors that most affect the function of the skin microbiome, to identify communities of microorganisms that can contribute to changes in normal physiology and the development of skin diseases.

Materials and methods. We used the descriptive research method: literary and Internet sources that are freely available were analyzed.