tion obtained by the ELISA. It means that the kinetic parameters of stretched exponential low have hidden intrinsic properties of the underlying interfacial reactions that are dependent on the concentration of specific component in the complex multicomponent mixture.

Stretched exponential regression to equilibrium is a frequently observed phenomenon in relaxation of non-equilibrium states. The coupling constant parameter β provides a measure of the width of the distribution of relaxation times. When β is equal to 1 then the KWW equation describes the single relaxation time of a simple exponential decay. As β decreases the breadth of the distribution of relaxation times increases. Non exponential relaxation in complex multicomponent systems may be the consequence of dispersedness giving rise to different free-energy barriers for different molecules [8]. A common view is that the two states may be split into a large number of substates that have a different exponential kinetics for the transition. The observed kinetics is then constructed by averaging over an ensemble of molecules with different exponential relaxation rates. The dispersedness is, thus represented by a probability distribution for the transition rates.

Further investigations are needed for the more precise determination of kinetic parameters, which should make possible a proper characterization of the stretched response function; their optimal combination can give opportunity to obtain new information regarding reaction under investigation. It gives a good basis for approaching a more specific microscopic model governing this exceptional physical phenomenon in complex protein mixtures.

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# THE ANTIPATHOGENIC BIOPREPARATIONS BASED ON MUSHROOMS' COMPONENTS AND CARRIES OF PLANTS

***В результаті проведених досліджень був розроблений продукт з високою біологічною активністю "Biocofunge"-1. До складу даного препарату входять компоненти грибів та інших речовин, що містяться в зернах хмелю. Препарат активізує ріст та розвиток рослин за зазначених умов.***

***The product with high biological activity "Bioecofunge"-1 was developed as a result of experiments. This preparation consists of fungi components and other substances, carriering of lupulin grains. It intensify growth and development of plants under appointed conditions.***

**Introduction.** There are significant changes because of anthropogenic impact on the biosphere structure and function of living systems' chains at present period can be supported in viable state by modern biotechnology. The development of processes of biologically active substances of different directions for the needs of the population remains very important in spite of significant scientific achievement in agricultural and medical engineering [1-8].

The main tasks of our study were researches based on the development of complex biopreparation [7] that stimulated the growth and development of crops while reducing their infection process caused by bacteria, viruses and microscopic fungi [2, 7, 8].

**Materials and methods.** The basis of experiments was a part of our working out technology based on the compositions of several families of plants, trace elements and volcanic rocks [3, 4]. The components of hop Humulus lupulus L. – bitter substances, which includes humulon ($S_{21}N_{30}O_5$) and other valuable substances, carriering of lupulin grains were used. The selection of these and others compounds was carried out from productive plants which were grown on healthy donors basis. The lasts were previously analyzed on virus-keeping by using electron microscopy, ELISA, PCR. Bacterial hop diseases and those that caused by microscopic fungi were determined visually and using well-known microbiological techniques [7]. The composition of hop components was supplemented with fractions of fungi (Basidiomycetes), selected from natural ecological niches and transformed environment served. Virological, microbiological and mycological control of fungi were performed in order to obtain healthy material. There were used 12 kinds of mushrooms (Basidiomycetes) that formed biological bank for selection of promising materials for the creation of biopreparations. More than 10 important components were tested during screening experiments.

There were used Agaricus bisporus (J. Lge) Imbach and Pleurotus ostreatus Kumm in this work. 0,68-0,72 kg of grinding fruit bodies was performed in frozen state with a gradual addition of 1l phosphate buffer 1/15 M, at pH 7,0-7,2. Thus, fungi homogenate and its fractions, as shown by research, can be prepared from fresh raw and dried materials using stepwise centrifugating of solutions for creating active compositions, with adding some microelements in some versions.

The dry weight of hops was grinded to dusty condition: received components were mixed in the way of adding 2,8-3,2 g of hop fraction to one liter of filtered solution from mushrooms.

For creation the working concentration of preparation "Bioecofunge-1" 1liter of $H_2O$ was added to15-18ml of received composition. The expenditure of working solution were 100-180 litters for 1 ha [3, 4].

Such crops as hops, tomato, tobacco, sugar beet, corn, beans, sunflower, have been involved in the laboratory and production experiments. Vegetation laboratory experiences were performed in 10 replicate.

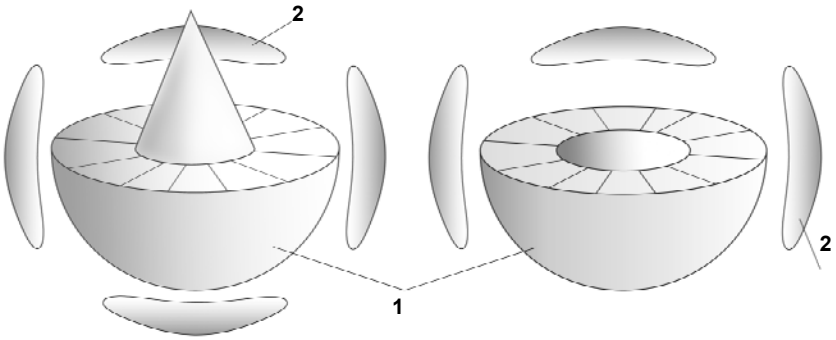


**Fig. 1. The diagram of biochemical agents composition for productivity stimulation and crops diseases protection: 1 – lupulin grains, nutrients and antipathogenic hop (Humulus lupulus L.) components, 2 – nutrients and antipathogenic mushrooms (Basidiomycetes) components**

Chenopodium amaranticolor (Coste & A. Reyn.) Coste & Reyn, Nicotiana glutinosa L. and Cucurbita pepo L. served as indicative plants for virological control.

**Results of research and discussion.** As the screening tests of preparation showed that "Bioecofunge – 1" reveals as a plants growth and development stimulator and shows antypathogen effect on crops during their ontogenesis. The best time for processing of plants by the preparation: sugar beet – on the stage of 3-4 leaves, wheat – in spring before returning to the tube, corn – on the stage of 5-6 leaves; beans – on the stage of 3-4 of real leaves, hop – after winding stems 0,8-1m height; tomato – 5-6 leaves; tobacco – 5-6 leaves. The better time to repeate the processing is after 14 days from the first case (spraying). These conditions help more intensive growth and development of processed by preparation "Bioecofunge"-1 plants in comparison with the control ones.

It is noted a significant reduction in the biological titer of virus genomic RNA: TMV, karlohrupy and cucumber mosaic vegetation during specialized studies. Thus, the hop plants, tomato, tobacco were infectioned after two-single processing by working solution "Bioecofunge – 1".

So, according to research, it was important to find the optimal proportion between fungi fractions and components of hop for forming the composition "Bioecofunge – 1". In this engineering process the improvement of products with high biological activity are very perspective for the further.

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# COMPARISON OF RUSSIAN AND UKRAINIAN ISOLATES OF *POTATO SPINDLE TUBER VIROID* (PSTVD)

***З 21 зразка картоплі відібраних на Україні, в тому числі 4 проростки, отримані в умовах in vitro, 13 ізолятів були ідентифіковані як позитивні в результаті дот-блот аналізу. Продукти ПЛР отримані з шести ізолятів пізніше були просіквіновані, два ізоляти сіквінувалися двічі. Було встановлено, що чотири ізоляти є ідентичними до російських ізолятів, а один – до польського ізоляту. Нуклеотидні послідовності трьох українських ізолятів ВВБК раніше не були описані.***

***Of 21 potato samples including 4 in vitro potato plantlets collected in the Ukraine, 13 isolates were identified as positive in dot-blot analysis. Six isolates gave PCR products suitable for sequencing that were made then, two isolates were sequence twice. Four isolates were identical in sequence to Russian isolates, and one to Poland isolate. Sequences of three Ukrainian PSTVd isolates were not described previously.***

**Introduction.** The first report of a 'spindle tuber' disease affecting potatoes growing in the USA appeared in 1922 (5). In the former USSR, the 'gothic' disease of potatoes was first reported and described in Ukrainian Republic in 1937 (10, 11). Later, Leontyeva (9) proposed that the causal agents of these two diseases were identical. In that same year, Diener (1) showed that the agent responsible for spindle tuber disease belonged to a new class of pathogens – small, unencapsidated, autonomously replicating RNA molecules that he termed 'viroids', Finally, Mozhaeva (8) used sedimentation analysis, mobility in PAGE electrophoresis, and infectivity analyses to demonstrate that the 'gothic' disease was caused by a viroid.

The first plant pathogen to have the complete nucleotide sequence of its genome determined (2), known isolates of *Potato spindle tuber viroid* (PSTVd) range in size from 341–364 nucleotides. Infection can be symptomless, or, alternatively, symptoms may range from mild to 'lethal'. Three groups of PSTVd strains (i.e., mild, intermediate, and severe) have been distinguished based on the symptoms observed on certain sensitive cultivars of tomato. In potato, typical symptoms induced the intermediate strain include: