EFFECT OF BACILLUS THURINGIENSIS BACTERIAL STRAINS ON PHASEOLUS VULGARIS PLANT BIOMETRIC INDICATORS AND DEVELOPMENT

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Abstract. *When observing the effect of biopreparations based on Bacillus thuringiensis strain on the biometric indicators and development of Phaseolus vulgaris plant, several changes occurred. As the positive aspects of these changes, the rapid development of its vegetative organs such as root, leaf and stem, changes in the time and quantity of the plant entering the harvest were observed. Based on this, the effect of the selected strains on local species was studied, and alternative biopreparations were recommended.*

Keywords: *Bacillus thuringiensis, Phaseolus vulgaris Cichorium intybus, Bacillus subitilis, Bacillus pumilis, Bacillus cereus.indonyl acetic acid.*

INTRODUCTION

Since its discovery nearly a century ago, Bacillus thuringiensis has been used as a biopesticide in agriculture, forestry, and mosquito control due to its specific toxicity to target insects, lack of contaminating residues, and safety to non-target organisms. . Today, Bacillus thuringiensis is the most successful commercial microbial insecticide, accounting for nearly 90% of the biopesticide market. The insecticidal properties of this bacterium are usually due to the presence of insecticidal proteins called crystals, which are formed during sporulation. New tools in biotechnology are changing the way scientists solve problems in agriculture. Transgenic technology containing a wide range of pesticide genes of Bacillus thuringiensis dominates the agricultural biotechnology scenario. At the same time, Bacillus thuringiensis technology is also the most criticized field of agricultural biotechnology. Genetic improvement of Bacillus thuringiensis strains to develop new biopesticides requires increasing their activity against target insects, expanding the insecticide spectrum for specific plant applications, improving plant resistance, and optimizing fermentation production.

Purpose and tasks of work:

It consists in studying and analyzing the effect of Bacillus thuringiensis bacteria strains on the biometric parameters and development of the bean plant. It can be said that the strains of the genus Bacillus today have a high potential in microbiology, biotechnology and many other fields.

METHODOLOGY

In the course of the research, all electronic and written sources on the topic were studied, their achievements and shortcomings were analyzed, and biotechnological, microbiological, botanical and statistical analysis methods were used in the practical part of the research.

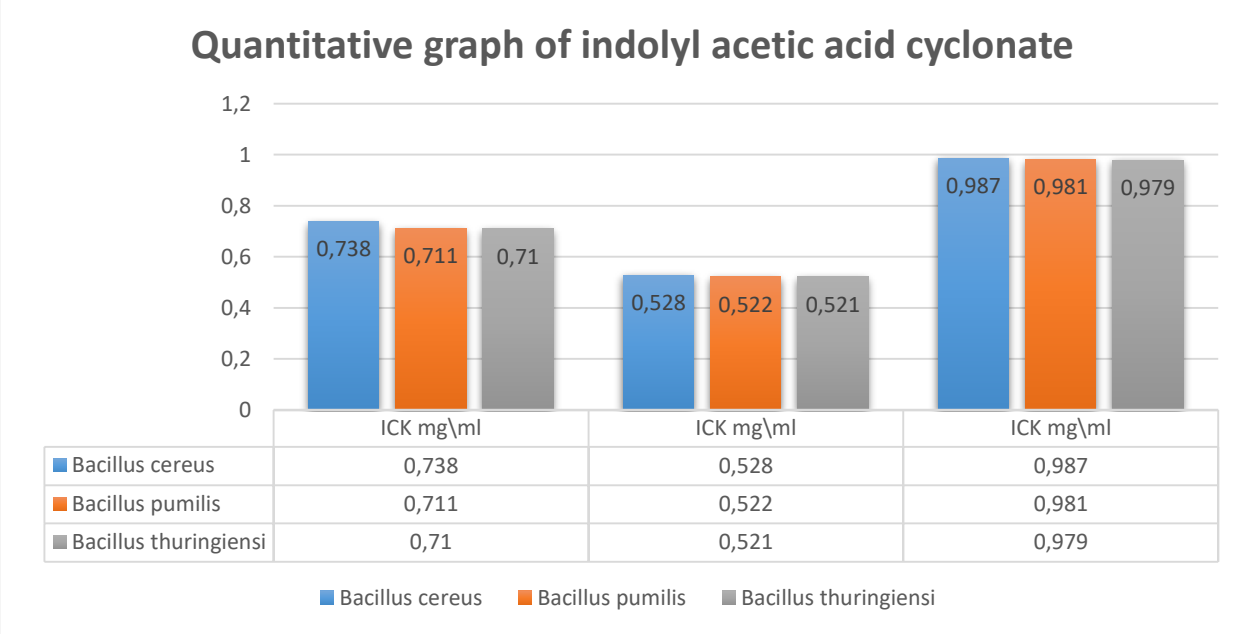
RESULT DISCUSSION

Literature analysis on the topic

Increasing the adoption potential of agricultural plants is directly related to global problems such as ensuring food safety and the need to protect the environment. An important factor in the adaptability of plants is the complex of their relationships with microorganisms. To date, studying the chemical and microbiological composition of medicinal plants and evaluating their biotechnological potential, obtaining biopreparations based on them determines the relevance of the topic. Plants can have microorganisms that live on them, but do not have any type of activity and do not cause obvious symptoms. These microorganisms are known endophytes.[6] We only examined stems and leaves of Cichorium intybus, but endophytes can also be present in roots, flowers, and seeds. C. Intybus leaves were found to contain more endophytes than branch segments (Table 1). The high species richness of a single anatomical site may be related to the unique characteristics of the microenvironment, as specific conditions in critical nutrients favor the survival of tissue-specific endophytes. Differences in the distribution of endophytes in different parts of plants have also been noted by others (10, 11). In summary, five bacterial endophytes inactivated by chloroform from seven endophytes of C. intybus in this study showed antibacterial activity (inhibition zone greater than 9.5 mm) against E. faecalis and S. aureus isolates. In the supernatant broth culture of bacterial endophytes of this herb, all endophytes from leaves and branches showed antibacterial activity against S. aureus and four endophytes against E. faecalis. One bacterial endophyte in each fraction showed broad-spectrum antimicrobial activity, indicating potential biotechnological applications of these plant tissue-dwelling endophytes. However, it is necessary to isolate, purify and identify the active compound(s) for their further use. Due to the fact that Bacillus enzymes retain their properties under different conditions, scientists recommend using different strains of the Bacillus genus in the fields of microbiology and biotechnology. For example, Bacillus pumilis BA06 is a producer of many mesophilic enzymes, which significantly increases its importance in industrial microbiology. In the field of medicine, the proteins produced by strains of the genus Bacillus are valued as drugs. Twenty years ago, in Russia, thrombovasim enzyme was obtained and it was used in myocardial infarction. Bacillus subtilis subtilase strain was found to be able to produce this enzyme. The lack of conditions for obtaining enzymes, various protein substances, biologically active substances led to the search for bacteria that synthesize this substance. As a result, Bacillus subitilis WB600, Bacillus subitilis JK-1, Bacillus subitilis TP-6, Bacillus subitilis DC33, Bacillus subitilis LD-8547, Bacilis subitilisA26, Bacilis subitilisBAF1, Bacilis subitilisBL21, Bacilis subitilisPTCC, Bacilis amyloquefaciens, Bacilis subitilis ICTF-1, Bacilis cereus SRM-001 led to the discovery and use of many Bacillus genera strains such as Bacilis pumilis 7P, Bacilis subitilisC10, Bacilis velezensis BS2. Bacillus licheniformis is a Gram-positive bacterium that produces highly biotechnologically important bacterial species with a large number of existing and potential uses, including the production of bioactive compounds used in a wide range of fields such as aquaculture, agriculture, food, biomedical and pharmaceutical industries. In addition, other biotechnological applications of B. licheniformis strains include: bioflocculation, biomineralization, biofuel production, and medicine, in addition to their widespread use as probiotics. In conclusion, endophytic microorganisms living in Cichorium intybus are a very promising source for the production of bioactive compounds effective against some human nosocomial bacterial pathogens. Further studies should be conducted to classify the endophytes living in the studied herbs and to exploit the substances produced by them.

RESULTS

Studies were conducted to determine the effect of selected endophytic bacterial strains on bean germination. First, bean seeds were sorted and left in 3% hydrogen peroxide (N2O2) for 30 minutes, then washed 10 times in distilled water. In experimental variants, Bacillus thuringiensis culture fluid was diluted 1/200 in dechlorinated water and treated with beans for 4 hours. The inoculated bean seeds were placed in sterilized Petri dishes in adapted moist chambers and placed in a thermostat at 27 °C. Seed germination was monitored for 4 days and data on variants was recorded daily. Then they were planted in the fields of "Polat Momo" and "Billura" farms of Pastdargom district. Control and bean fields with Bacillus thuringiensis culture liquid were studied separately.



It was planted on the fields of "Polat momo" and "Billura" farms in the district of Pastdargom. Control and Phaseolus vulgaris areas with Bacillus thuringiensis culture fluid were studied separately.

CONCLUSION

IUK was detected in Bacillus thuringiensis, Bacillus pumilis, Bacillus cereus. Among them, the bacterial liquid of Bacillus thuringiensis was selected to affect leguminous crops.

The effect of the selected strain on bacterial culture liquid Phaseolus vulgaris was determined. These strains can be used to create entamopathogenic preparations against diseases of leguminous crops and improve plant growth.

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