THE ANTAGONISTIC ACTIVITY OF THE PGPB BACTERIA AGAINST OF *SOLANUM TUBEROSUM* L. PATHOGENS

V.V.BORODAY , PhD. Biol. Science, Associate Professor
S.E.SAFRONOVA , Master's student

The microbiological preparation Ekstrasol based on the consortium of ssociative bacteria investigated, the wide spectrum of antibiotic action against Fusarium solani, F.oxysporum, F. sambucinum, Alternaria solani and Pectobacterium carotovorum was found. The growth of pathogens was inhibited by application of Ekstrasol in the 1,4-1,9 times compared to Fitotsyd and in the 1,7- 2,3 times - to Planryz.

Introduction. Potato (*Solanum tuberosum L.*) is a valuable food and technical culture. However, obtaining high and stable yields prevents widespread diseases that diseased of tubers during storage – fusariosis, scab and other pathogens, the loss of which can reach 50-85% [4]. Modern Trends in Plant Protection aimed at developing and finding environmentally safe management techniques the number of pathogens, including microbiological preparations for plant protection and bacterial fertilizers. Rhizospheric and entophytic bacteria belonging to the group microorganisms that promote plant growth (of Plant Growth-Promoting Bacteria - PGPB) successfully used for biocontrol of pathogens [1,3,6]. Bacteria of *Pseudomonas* and *Bacillus* genera, which used as biological plant protection agents, indirectly induce protein expression of systemic inductive resistance; promote accumulation in the affected area of certain phenols, antioxidant enzymes systems and products of their operation (reactive oxygen species, phytoalexins, lignin). The microorganisms - components of natural microbiological agents induce systemic plant resistance to disease at the horizontal level, have an effect, which is stored in postharvesting period, which is especially important for long-term storage potatoes and vegetables. In Ukraine, efficiency of various associative bacteria such as *Artrobacter*, *Flavobacterium*, *Agrobacterium*, *Bacillus*, *Pseudomonas*, *Azospirillum* are not discovered. The biological preparation

Ekstrasol was designed at the Russian Institute of Agricultural Microbiology, it can storage during 2 years[1].

The purpose of researches - analysis of antagonistic activity of preparations against pathogens of potato tubers in the model laboratory researches to study the possibility of using biological preparation Ekstrasol to protect potato tubers during storage, which we analyzed.

Materials and methods of the research. The work was conducted in the Industrial Biotechnology laboratory of the Department of Ecobiotechnology and Biodiversity of NULES of Ukraine in 2012-2014 years. Phytopathogenic bacteria and fungi *Fusarium solani*, *Fusarium oxysporum*, *Fusarium sambucinum*, *Alternaria solani* and *Pectobacterium carotovorum* were the objects of researches. They were cultivated on selective media at controlled temperatures [2,4]. Evaluation of fungal and bacterial activity was performed by agar diffusion using paper disks impregnated with preparation by conventional methods [2,4,5]. We investigated the following preparations: control - water treatment; biological control - Phitotsyd-R (based on the bacteria *Bacillus subtilis*, BTU Center, Ukraine), Ekstrasol (consortium of associative bacteria, Russian Research Institute of Agricultural Microbiology); Planryz (based on the bacteria *Pseudomonas fluorescence*, made in biolaboratory of State Inspection for Plant Protection, Lviv region). The plates were incubated at controlled temperature 18-22 ° C for 24 h. The evaluation of antagonistic activity of microbial preparations to pathogens carried on by height of inhibition zone (mm), formed around colonies.

Conclusions

Microbiological preparation Ekstrasol, based on consortium of associative bacteria *Artrobacter mycorens* 7, *Flavobacterium sp. L*.-30, *Agrobacterium radiobacter* 204, *Agrobacterium radiobacter* 10, *Bacillus subtilis* B-13, *Pseudomonas fluorescens* 2137, *Azospirillum lipoferum* 137 had the wide spectrum of antibiotic action to *Fusarium solani*, *F.oxysporum* and *F.sambucinum*, *Alternaria solani* and *Pectobacterium carotovorum*. The applying of Ekstrasol inhibited of pathogenic growth in 1,4-1,9 times compared to Phitotsyd-R and in 1,7-2,3 times – to Planryz.

The microbiological preparation Ekstrasol was investigated (based on the consortium of associative bacteria), that had a wide range of antibiotic action in

relation to Fusarium solani, F.oxysporum, F.sambucinum, Alternaria solani, and Pectobacterium carotovorum. It was studied, that the applying of Ekstrasol inhibited of phytopathogenes growth in 1.4–1.9 times more compared to Fitotsid-R and in 1.7–2.3 times -to Planriz.

Antagonistic activity, microbiological preparations, rhizosphere and endophytic bacteria, phytopathogens.