RESEARCH ULTRAVIOLET RADIATION AT ENHANCING THE ANTIMICROBAL PROPERTIES OF THE DRUG «БІОДЕЗ»

T. Tkachuk, engineer

T. Knizhka, Ph.D.

The effect of ultraviolet radiation on the antimicrobial properties of aqueous solutions of the drug «Біодез» Defined effective disinfectant exposure to ultraviolet radiation.

Keywords: ultraviolet radiation, disinfectant, photoactivation, irradiation of aqueous solutions.

Past studies of liquid media exposure ultraviolet radiation proved the effectiveness of this method of influence on the activation properties of irradiated materials. Since ultraviolet radiation is a natural and given the low cost of this method of influence on the matter, there is interest in research UV radiation on water disinfectant solutions and identify effective modes of its exposure.

The purpose of research – the study of the effect of optical radiation in the ultraviolet range of antimicrobial properties of aqueous solutions of disinfectant. Determining an effective disinfectant exposure to ultraviolet radiation.

Materials and methods research. As a source of UV lamp used ДРТ-400 with a wave maximum $\lambda = 365$ nm. The distance between the radiation source and the surface of the liquid was 0.25 m. Photoactivated fluid paid in on agar medium immediately after seeding bacteria on it. The degree of bacterial growth was recorded 24 hours after processing environment with bacteria photoactivated liquid.

For culturing microorganisms used nutrient agar – universal dense environment on a natural basis, consisting of meat broth and agar (0.5-2 %). From bacteria *Staf. aureus* were taken from sick animals with pus, mucus from the throat, sputum, urine and blood.

Results. To investigate the mechanism of UV radiation on the physical characteristics of solutions of disinfectants on the NULES of Ukraine held

measuring pH, redox potential, conductivity and salt content disinfectant solution immediately after irradiation and during the period aftereffect.

Analysis of the results shows that ultraviolet radiation exposure from 5–15 min. significantly changing the pH and redox potential water solution of disinfectant. Prolong exposure slightly changes the parameters studied.

At the Department of Microbiology NULES of Ukraine we conducted microbiological research on determining the effect on growth of Staphylococcus disinfectant properties «Біодез» and exposed to ultraviolet radiation with different exposures aqueous solution of disinfectant.

In order to identify the economic effects using disinfectant concentration after irradiation it was taken 10 times less than the recommended amount, namely «Біодез» – 0.5 %. Exposure time disinfectant solution – 2, 5, 10 and 15 min.

Found that irradiation with an exposure of 5 to 15 min solution «Біодез» effectively enhances the antimicrobial properties of the solution. Maximum antimicrobial activity observed for the solution with an exposure of 10 min.

Conclusions

Ultraviolet radiation is dramatically changing the pH and ORP water solution disinfectants. The intensity changes of pH is characteristic of ultraviolet radiation exposure from 5-15 min.

Radiation exposure of 10 min a solution «Біодез» effectively inhibits the growth properties of microorganisms. The concentration of the aqueous solution of irradiated disinfectant can be 10 times smaller than the unirradiated.