

PROBLEMS OF DISINFECTION IN BIOTECHNOLOGICAL LABORATORIES

Punina J. A., Strelnikov L. S.

Scientific supervisor: assoc. prof. Shapovalova O. V.

National University of Pharmacy, Kharkiv, Ukraine

puninajulia1012@gmail.com

Introduction. Disinfection is a complex of measures aimed to demolish pathogens and toxins on objects of the external environment to prevent them from getting on the skin, mucous membranes of personnel, surfaces, materials and tools in biotechnology laboratories. It is one of the types of decontamination. Proper surface treatment helps to obviate of all known viruses and bacteria, up to the human immunodeficiency virus and all forms of viral hepatitis. It is this property of disinfection that makes it very relevant and important. For today, there are a large number of disinfectants. However, the creation of new effective disinfectants is one of the main problems of disinfection, which does not lose its relevance as it is solved.

Aim. Study of the benzalkonium chloride and peroxyacetic acid disinfecting composition effect on the test-microorganisms cultures.

Results and discussin. Peroxyacetic acid (peracetic acid) is an effective disinfectant with a high oxidation potential. It is effective against a wide range of microorganisms and is not deactivated by bacterial enzymes catalase and peroxidase, which destroy hydrogen peroxide. It can be used in a wide range of temperatures (0 - 40° C), pH (3.0 - 7.5) and water hardness. It is used for disinfection in the biotechnological, medical industry and other industries where there are requirements for the cleanliness of the premises, as well as for various types of technological equipment, parts, machines and installations, tools and containers made of stainless, chrome-nickel steel, glass-enamel, acid-resistant plastics on enterprises food industry - dairy, meat, beer-beans and poultry processing.

Benzalkonium chloride (quaternary ammonium compound) is an antiseptic, antifungal, antiprotazoal, antiviral drug. It shows bactericidal activity against staphylococci, streptococci, gram-negative and gram-positive aerobic and anaerobic bacteria, fungi and molds. It is biocidal on strains resistant to antibiotics and other chemotherapeutic drugs. It is used alone or in combination with other substances for antiseptic treatment of hands, wounds, treatment of cutaneous and other diseases.

Unified methodology for the disinfectants activity studying includes the following steps:

- The working dilutions of disinfectant solutions preparation - working solutions are prepared on sterile tap water at a temperature of (18-20)⁰C.
- The test-microorganisms suspensions preparation at a concentration of (1-2) billion MT / cm³ using agarized or liquid nutrient media.
- The expanded research realization, including the microorganisms test-cultures incubation with the selected concentration of disinfectant in strictly controlled time and temperature regimes.
- The research results evaluation, which is based on the identification of viable microorganisms resistant to the disinfectant action.

In view of the fact that the resistance mechanisms in each microorganism and fungal spores are different, the following microorganisms are used as test-cultures: *Escherichia coli*, *Staphylococcus aureus*, *Bacillus subtilis*, *Candida albicans*.

Conclusion. A significant advantage of combined preparations based on peracetic acid is the lack of the microorganisms resistance to their action. Such drugs will have a wide range of applications, including treatment of all types of surfaces, disinfection of waste, medical products and medical equipment. Their use is most attractive for the purposes of disinfection and sterilization of laboratories for medical, pharmaceutical and biotechnological profiles, medical devices and medical equipment.