DISCOVERING NEW ANTIMICROBIAL AGENTS
ПОШУК НОВИХ АНТИМІКРОБНИХ ПРЕПАРАТІВ

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It is well known that the number of new antimicrobial agents being brought to the market has undergone a steady decline in the past several decades. There are a number of reasons for this, but there is also a great deal of continuing research to find new effective antimicrobials, much of it now being carried out in academic centers and especially in small biotechnology companies. Whilst classic screening methods and chemical modification of known antimicrobial agents continue to produce potential leads for new antimicrobial agents, a number of other approaches are being investigated. These include the search for potentiators of the activity of known antimicrobial agents and the development of hybrid agents, novel membrane-active drugs, and inhibitors of bacterial virulence and pathogenesis. A number of new bacterial targets are also being exploited, as are bacteriophages and their lytic enzymes. Despite the above, the situation is perhaps not quite as bleak as it may seem on the surface. It is noted that there are suggestions that the tide is starting to turn with regard to the development of new antimicrobial agents [1]. A number of major activities are currently in progress to find novel antibacterial agents.

The study of the antimicrobial properties of surfactants have been carried out at the Biotechnology and Ecology faculty of our University. Surfactant is a substance composed of two functional parts: a polar basic hydrophilic group and a non-polar one with a hydrophobic residue. Due to this molecular structure solutions of surfactants can reduce surface and interfacial tension. Surfactants of microbial origin are used in the petroleum, chemical, pharmaceutical, food processing, agriculture, as well as for environmental purification from hydrocarbons and heavy metals [2, 3]. As mentioned above, recently there has been increasing resistance

of many pathogens to existing drugs, that caused the search for alternative drugs. Microbial surfactants can be regarded as a potential for usage in medicine, because they are nontoxic, do not cause allergies, have antimicrobial effect on a broad spectrum of microorganisms [4, 5].

The purpose of this study is to investigate the antimicrobial properties of surfactants *Rhodococcus erythropolis* EK-1 and *Acinetobacter calcoaceticus* K-4. Strains R. *erythropolis* EK-1, and A. *calcoaceticus* K-4 have been isolated from oil-contaminated soil samples [6]. Several factors affect the antimicrobial properties manifestation of different compounds: the concentration of cells, the concentration of the substance and duration of exposure. Surfactants A. *calcoaceticus* K-4 were the most effective. This kind of surfactants in fact reduces the activity of known pathogens as: *Escherichia coli IEM -1*, the yeast *Saccharomyces cerevisiae* OB -3 and the fungi *Aspergillus niger* R-3 and *Fusarium culmorum* T-7.

As a result of this work it was found that the surface-active substances R. *erythropolis* EK-1, and A. *calcoaceticus* K-4 have antimicrobial properties concerning a number of microorganisms (C. *tropicalis* PBT-5, B. *subtilis* BT-2, C. *utilis* BVS-65, S. *cerevisiae* OB-3, E. *coli*, IEM-1 and C.*albicans* D-6), and surfactant A. calcoaceticus K-4 has a broader spectrum of actions, though in case of some cultures these drugs are less active.

Literature

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