

THE GROWTH OF SULFATE-REDUCING BACTERIA UNDER THE INFLUENCE OF WIRELESS COMPUTER NETWORKS

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Summary. The influence of wireless computer networks (wi-fi) on the concentration of cells of sulfate-reducing bacteria was investigated.

Introduction and aim. Different devices radiating electromagnetic fields (EMF) of different intensities are widely distributed in our life: at home, work and public places. Currently there is growing evidences about the negative effects of electromagnetic irradiation on living organisms. One of the sources of electromagnetic environmental pollution in the microwave wavelength range is the wireless computer networks (wi-fi), which have a frequency range of 2.4 and 5 GHz (Вдовина, 2016). Microwave radiation of technogenic origin is one of the factors of accelerated reproduction of microorganisms and enhancement of their antibiotic resistance properties (Вдовина, 2016). Microorganisms that are involved in damaging materials are sulfate-reducing bacteria (SRB). Their high number and production of hydrogen sulfide contribute to the intensification of corrosion processes (Мікробна корозія металевих споруд, 2005). However, the influence of wireless computer networks (wi-fi) to the concentration of SRB cells has not been investigated. The aim of the present research was to study the effect of exposure to Wi-Fi radiation on the growth parameters of sulfate-reducing bacteria.

Materials and methods. Influence of wi-fi (wireless router of series N with speed of data up to 150 Mbit/sec. with amplification of antenna 5 dBi, frequency range of 2,4~2,4835 GHz, purchased in a trading network) on SRB was investigated in a laboratory model experiment using pure cultures of SRB isolated from the soil ferrosphere: *Desulfovibrio* sp. NUChC SRB1 and *Desulfovibrio* sp. NUChC SRB2 (Ткачук та ін., 2019). The amount of inoculum was 10% of the volume of the sown Postgate's C medium without Fe²⁺ ions. The test cultures were left directly at a source of round-the-clock wi-fi (experiment) and at a distance of 8 m from it (control) at a temperature of 24±1°C. The optical density of bacterial cultures was measured with the photoelectric colorimeter at 670 nm after 0 and 108 hours of exposure. Statistical data processing was done using the Microsoft Excel 2010 application package.

Results and conclusion. The results of comparison analysis showed insufficient differences of bacterial cell concentration between control untreated group and exposed to wi-fi irradiation.) Thus, we have noted the lack of both stimulating and depressing influence of wireless computer networks on the growth of SRB of investigated strains.

Keywords: EMF, wi-fi, sulfate-reducing bacteria, the concentration of microbial cells