Niewątpliwie, substancje promieniochronne są jedną z najlepszych metod profilaktyki przed nowotworami skóry. Niemniej jednak powszechność oraz nagminne stosowanie filtrów UV, może przyczyniać się do ich akumulacji w środowisku. Niezbędne jest więc prowadzenie monitoringu mającego na celu oznaczenie poziomu tych substancji w ekosystemie wodnym oraz potencjalnych skutków długotrwałego narażenia ich wpływu na organizmy wodne i wynikających z tego możliwych zagrożeń.

Bacteria of *Bacillus* and *Streptomyces* genera as participants of corrosion damage of materials

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The participation of microorganisms in soil microbial corrosion is considered in connection with their geochemical activity, which, according to Vernadsky V., is activated in conditions of technogenesis (Вернадский, 1967). Many mechanisms have been proposed for the microbial damage of materials, such as the reduction or oxidation of metals, the effect of organic and inorganic acids, enzymes, etc. (Андрєюк та ін., 2005; Kan et al., 2011). In recent years, identification and biochemical characteristic of properties of microbes isolated from corroding sites has been a high priority. A basic knowledge of the microbial species involved in microbial corrosion will provide the basis for detection, monitoring and control of the microbial damage of materials (Kan et al., 2011). Currently, the functional roles of different bacterial groups identified by molecular analyses in the microbial damage of materials remain an open question, and this area deserves further microbiological, physiological and chemical analysis.

From the samples of the ferrosphere of the soil, we isolated strains of heterotrophic microorganisms which were analyzed and selected as forming corrosive metabolites. Further studies were carried out with three selected strains of bacteria: ChNPU F1 and ChNPU F3 strains with ammonifying properties, ChNPU ZVB1 strain, which exhibited simultaneously ammonifying and iron-reducing properties (Ткачук, Зелена, 2016). Based on a complex of microbiological, physiological-biochemical and molecular genetic studies (the sequence of the 16S rRNA gene (based on the results of a phylogenetic analysis), the isolated bacteria are classified as *Bacillus simplex*, *Streptomyces gardneri* and *Fictibacillus sp.*, respectively. The nucleotide sequence of the fragment of the 16S rRNA gene of the strains was recorded in the GenBank database as *B. simplex* KX349220 (https://www.ncbi.nlm.nih.gov/nuccore/KX349220.1), *S. gardneri* KX349221 (https://www.ncbi.nlm.nih.gov/nuccore/KX349221.1) and *Fictibacillus sp.* KX349222 (https://www.ncbi.nlm.nih.gov/nuccore/KX349222.1). Therefore, the purpose of this work was to summarize the literature data on the participation of

representatives of *Bacillus* and *Streptomyces* genera in the corrosion damage of materials.

The analysis of available literature sources indicates that the intensity of microbial damage of metals by the bacteria of *Bacillus* and *Streptomyces* genera depends on the type and strain that were investigated (Jayaraman et al., 1997; Volkland, 2001; Ornek et al., 2002; Rajasekar, Ting, 2010; Bano, Qazi, 2011; Bragadeeswaran et al., 2011. Aïmeur et al., 2015; Wadood et al., 2015).

In addition to monocultures of *Bacillus* and *Streptomyces*, their associative cultures are also being studied; both strengthening and inhibiting corrosion are noted (Song-Mei et al., 2009; Songmei et al., 2010; Santana et al., 2012; Du et al., 2014; Winn et al., 2014). Prevention of bacterial corrosion by these genera is considered as the formation of bacteria by antimicrobial agents (Jayaraman et al., 1999; Nnabuk Okon Eddy, 2010; Pacheco da Rosa et al., 2013; Pacheco da Rosa et al., 2016). Among the secondary metabolites of streptomycetes, special attention should be paid to thiazolyl peptides (thiopeptides), since it was found that thiocillin (an antibiotic of the thiopeptide group) promotes the growth of the population of matrix-producing *B. subtilis* (Bleich et al., 2015).

The corrosive effect of the bacteria of *Bacillus* and *Streptomyces* genera depends not only on the formation of antimicrobial compounds, but also on the type of material being damaged. It was found that *Bacillus mycoides* performs different roles on different metals, namely, accelerates zinc corrosion, inhibits aluminum corrosion and does not affect soft steel (Juzeliunas et al., 2006).

Thus, representatives of *Bacillus* and *Streptomyces* genera are actively being investigated as participants of biocorrosion in mono- and associative cultures, and their role depends on the species and strain of the microorganism, the production of antimicrobial substances, and the type of material being damaged.

Evaluation of the ecological condition of water in the Desna river by measurement of the hydrochemical parameters

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The Desna river is the second (after the Prypyat') by water content tributary of the Dnipro river with the catchment area of 88900 km². The Desna river is transborder: 62% of the river basins is on the territory of the Russian Federation, while Ukrainian catchment area covers 33820 km².

The most important objects of the technological impact on the hydrological, hydrochemical and ecological condition of the Desna are the following: the cool reservoir of Atomic Power Station in Smolyensk, Kursk Atomic Power Station built on the catchment area of the Seym river, chemical factory in Shostka. Pollution of the Desna river on the territory of Chernihiv is made in general by the pollutants of the