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URBAN MICROBIOLOGY OF VILNIUS. BACTERIAL DIVERSITY IN STREET GREENERY

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Urban microbiology is a field of study that explores urban microorganism communities, their diversity, distribution, and functions in their habitat, as well as interactions with humans, animals, and plants. Like the human microbiome consists of microbial consortia inhabiting regions throughout the body, urban microbiomes are a collection of microbial communities that occupy diverse reservoirs throughout city landscapes, from the depths of sewers to the tops of buildings (Madeline Barron, 2021). Green infrastructure features have been built in urban areas as elements providing a range of benefits, e.g., processes that are mediated by microorganisms that improve air and water quality, in addition to the interactions with plant and tree rhizospheres. Investigation of microbiomes of the urban green infrastructure is one of the most important areas in urban microbiology research. In current study we present metagenomic urban microbiome analysis from 4 different locations of Vilnius. The objective of this study was to characterize the bacterial diversity of the street greenery in the streets of different activity. We have collected soil as well as wood chips samples from pedestrian and bicycle paths that are close or relatively close to the road from Shevchenkos, Gerosios vilties, Baltupiu and Antakalnio streets in Vilnius. We found that greenways in different streets have diverse bacterial communities, that were not associated with geographic locations. The most abundant bacterial phyla across all samples were Pseudomonadota, Actinobacteriota, Bacteroidota, and Acidobacteriota. The highest diversity across all samples has been determined in classes of Alphaproteobacteria, Actinobacteria, Gammaproteobacteria, and Bacteroidia. Unculturable bacteria have been detected in all samples. These Candidatus bacteria are commonly found in water deposits or water sediments samples and are known to belong to the phyla Pseudomonadota, Chloroflexota, and Acidobacteriota.