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CLIMATE CHANGE AND SOIL MICROBIOME

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Microbial processes in soil have a key role in the global fluxes of biogenic greenhouse gases (carbon dioxide, methane and nitrous oxide) and are likely to respond rapidly to climate change. Important parameters of the soil microbiome are the number and functional diversity of microorganisms, soil respiration (CO_2 emission) and enzymatic activity. Well known that more than 1 billion tons of carbon is added to the atmosphere each year through change of land use. The purpose of our studies was to investigate the dynamics of CO_2 emission from soils of agrogenic, postagrogenic and natural ecosystems and they soil microbiome. In the transformation of arable soils to postagrogenic category changing the flow of major biogenic elements in the ecosystem, including carbon. Self-restoration of abandoned cropland can be considered as a combination of natural processes aimed at achieving homeostasis by the ecosystem. Monitoring studies of the emission of carbon dioxide from soddy-podzolic soils and analysis of soil microbiome were conducted from 2010 to 2017 in dynamics. Were isolated 468 dominating bacteria, among them 79 antibiotic resistant bacteria. All isolates were multi-drug resistant, of which greater than 74,5% were resistant to 9 antibiotics. Multi-resistance was such pathogenic and conditionally pathogenic bacteria as: *Enterococcus faecium*, *Acinetobacter baumannii*, *Pseudomonas aeruginosa, Escherichia coli, Bacillus licheniformis, Serratia fonticola, Hafnia* alvei, *Bacillus cereus, Bacillus megaterium* and *Clostridium difficile.* The maximum level of intensity of carbon dioxide emissions from soils of the studied ecosystems was fixed from the beginning of May to the end of June, due to a favourable combination of abiotic factors for the activity of the soil microbiota. The amount of carbon dioxide produced by virgin soddy-podzolic soils averaged - 79.55 (mg CO_2 / kg soil / day); postagrogenic - 64.25 (mg CO_2 / kg soil / day); agrogenic - 52.18 (mg CO_2 / kg soil / day). In post-agrogenic soils, the value of the total CO_2 emission for vegetation was greater than in agrogenic soils. This is explained by the absence of alienation of primary production, as well as by phytogenic and microbiogenic successions, which leads to a gradual restoration of the natural state of soils and the accumulation of carbon in the post-agrogenic ecosystems.

Keywords: *soil, ecosystems, microorganisms, climate change, microbiome.*

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