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# CLIMATE CHANGE AND ACTIVITY OF SOIL MICROORGANISMS

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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. It is 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, post-agrogenic and natural ecosystems and the soil microbiome. In the transformation of arable soils to post-agrogenic category changing the flow of major biogenic elements in the ecosystem, including carbon. Self-restoration of abandoned crop land 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 were conducted from 2008 to 2017 in dynamics. 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 ($mgCO_2$ /kgsoil/day); postagrogenic 64.25 ($mgCO_2$/kg soil/ day); agrogenic-52.18 ($mgCO_2$/kgsoil/day). In post-agrogenic soil, 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.**

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