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SOIL BIOLOGICAL ACTIVITY AND THEIR SEASONAL VARIATIONS IN RESPONSE TO CLIMATIC CHANGES

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Climate change is a serious global problem that biosphere encounter in the present. Due to technological advancement and continuous innovation, they directly affect the atmosphere which causes climate change. Human activities are solely responsible for the actions. Climate change has consequences for global food sources (Lithosphere), health (human, animal, and plant), weather (atmosphere) and oceans (hydrosphere). The effect of climate change is the occurrence of longer and more frequent drought and flood that put challenges in growing crops, the animals shift to another places to live and the water supply diminish. It also affects physical health especially in urban areas where the air is polluted. In these scenarios, the application of engineering principles are important in solving problems especially in soil and water management, soil and water conservation engineering. Agricultural engineer has a great role in solving engineering problems that involve in soil and water conservation programmes such as erosion control, drainage, irrigation, flood control, moisture conservation and water resource development. It also includes the restoration of unused land, rural water supply and land use control and conservation of our natural resources. Brown forest soils characterized by three distinct microbial communities (winter and summer community, and summer community from wheat cultures, alfalfa culture) were investigated with or without inorganic CNP supply and analysed for substrate use and various microbial processes. Our results clearly demonstrate that the investigated microbial communities differed in their functional response to addition of various substrates as well as the changing in the ecological factors. The winter communities revealed a higher capacity for degradation of complex C substrates than the summer communities, indicated by enhanced cellulase activities and reduced mineralization of soil organic matter. Also, it was found that the microbial communities, soil respiration and enzyme activities were sensitive to the seasonal changes and in this case the climatic change can work as main factor in soil fertility.

Keywords: *C and N availability, enzyme activities, microbial community composition, microbial processes, soil respiration rate*

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