

Effects of cadmium and nutrient salts on soil microbial extracellular enzyme activities in wetland sediment

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The study was conducted on the changes in microbial activities in wetland soil by adding cadmium and nutrient salts when complex contaminated wastewater inflow occurs. Microcosms were manipulated by using 100 mg/kg cadmium, nitrogen (15 ppm, NH_4NO_3), phosphorus (1.5 ppm, KH_2PO_4): No addition (control), N+P, N+Cd, P+Cd, N+P+Cd, respectively and the replicates of each conditions was three. The properties of soil, pH, water content, organic matter content, the amount of nutrients adsorbed to soil, NH_4^+ , PO_4^{3-} , and the extracellular enzyme activities in it, N-acetylglucosaminidase, phosphatase, and dehydrogenase activities which is used generally as an indicator of microbial metabolism, were analyzed.

Nutrients and cadmium seemed to have interactions concerned the processes of adsorption to soil surface. Due to the competitive interaction between positive cadmium ion, ammonium ion and negative charged soil surface, adsorption of NH_4^+ was decreased with the existence of cadmium. We could also find out that when inflow of Cd occurs in microcosm, N-acetylglucosaminidase was more vulnerable than phosphatase, suggesting N-acetylglucosaminidase would be a proper indicator to show the effects of heavy metal like cadmium.

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