

Sorption of bioavailable arsenic on clay and iron oxides elevates the soil microbial activity

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The influence of arsenic on microbial activity inhibition and activities influenced by soil minerals such as clay minerals (bentonite and kaolinite) and iron oxides (hematite, goethite and magnetite) were investigated. The bacterial species like *Pseudomonas jinjuensis* was used because it is widely available in the soil constituents. The influence of clay minerals and iron oxides on arsenic toxicity to bacteria was assessed indirectly through the relative change in microbial hydrolysis of fluorescein diacetate (FDA). Although the absorbance of optical density (OD) tends to increase under arsenic contamination, it was inappropriate for toxicity assessment, FDA was suitable for the experiment as it clearly distinguished the decrease in activity caused by the toxicity of arsenic. The bentonite and hematite showed that promoting bacteria activity and reducing the negative impact from arsenic to bacteria, constantly, magnetite had a negative impact on bacteria activity. These results indicate that the clay minerals and iron oxides influenced the bioavailability of arsenic in groundwater, also surface area and cation exchange capacity of clay minerals and iron oxides were important facts on the bioavailability of arsenic.