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Microbe-Mineral Interactions and their Influence on Arsenic Transformations in the Soil Environment.

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Arsenic (As) contamination of soil and water is of concern at the local, national, and international level. Sources of As from agriculture include pesticides, sewage sludge, and animal manures. The application of poultry manure/litter on soils of the Middle Atlantic and Southern Regions of the USA has raised concerns about As contamination of drinking water supplies. Many soil constituents impact As transformations including microorganisms and manganese oxides. Ultimately, reactions such as adsorption and redox transformation control the speciation, toxicity, mobility, and bioavailability of As in soils. The objective of this research is to understand the role that microorganisms (bacteria) and reactive mineral surfaces (manganese and iron oxides) play in As reaction pathway(s) in soils. This objective was investigated using stirred-flow studies and in situ attenuated total reflectance (ATR) Fourier transform infrared (FTIR) spectroscopy.

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