Nitrogen Transformations in Soils in the Presence of Trace Elements. (S02kpomblekou150737-Poster)

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Abstract:

Accumulation of trace elements (TEs) in soils has generated concern over their effects on microbial proliferation, enzymatic activities, and on rates of biochemical processes. We investigated the effects of equimolar concentrations of ten TEs (As, Cd, Co, Cr, Cu, Fe, Mn, Ni, Se, and Zn) on N transformations in soils. A 10-g sample (OD) of surface field-moist soils were mixed with an amount of broiler litter to give 200 mg N/kg soil. The mixture was transferred into a 4-oz (118-mL) French square bottle and treated with 2 mL of a solution containing 0 to 0.500 mmol of a given TE. Duplicate bottles were incubated at 25 degree Celsius for four weeks. At the end of incubation, the contents of each bottle were extracted with 50 mL of 2 M KCl solution. The NH4+ and (NO3-+ NO2-)-N in the extract were analyzed by steam distillation. The effects of TEs varied significantly with soils. Chromium, Cu, Ni, and Se have no effects on ammonification; As, Co, Fe, Mn, and Zn increased ammonification. Cadmium reduced ammonification from 57.7 to 3.56 mg/kg soil when its concentration increased from 0.300 to 0.500 mmol. Nitrification was severely depressed by cobalt at concentrations >0.100 mmol.

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