

Carbon mineralization under saline conditions

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Abstract

Soil salinity, as an increasingly important process of land degradation, is a major threat to microbial communities and thus strongly alters organic matter turnover processes. This study was conducted to determine the influence of salinity on the decomposition of animal manure and on the response of soil microbial activity.

A factorial combination of two soil types (normal soil and saline soil) with four treatments (control, poultry manure, goat manure and cow dung) were used in laboratory incubation. Carbon mineralization was determined at 3, 7, 14, 21, 28, 35, 42, 49, 56 and 70 days after the treatments. The experiment was replicated four times and data were statistically analyzed using SAS package.

The amount of CO₂-C released from animal manure treated soils was found to be increased at an increasing rate with time. Furthermore, with different initial composition of the three manures applied to the soil resulted in different rates of CO₂ evolution. Though no significant ($P \leq 0.05$) variation among the treatments was found until day 2, a significant difference between normal soil and saline soil when amended with animal manure (except cow dung) was seen as the incubation progressed. However cow dung showed the highest carbon mineralization throughout the incubation period when compared with the other treatments. Soil salinity reduced the rates of CO₂ evolution by 43%, 24% and 6% in poultry, goat and cow dung amended soils, respectively. It could be concluded that the response pattern of C mineralization to salinity stress depended on the type of animal manure and duration of incubation.

Key words: Animal Manure, Carbon Mineralization, Incubation