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***Programs of the Graduate School
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Okayama University



OKAYAMA
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Place:

The Main Conference Room, Building of Graduate School of
Natural Science and Technology, Okayama University

**Determination of nitrous oxide and carbon dioxide emissions from manure
compost-amended soils under aerobic incubation**

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This study investigated effects of compost and soil properties and moisture-induced aerobic nitrification on N₂O and CO₂ emissions and abundances of ammonia oxidizing functional genes. Laboratory tests were conducted using cattle manure compost (CC) or mixed compost (MC) (cattle, poultry, and swine manure) amended with Kochi (greenhouse soil) or Ushimado (paddy soil) soils (3% by weight) with controls (without compost). Initial moisture contents were adjusted at 60% water holding capacity (Kochi soil) and 70% (both soils), and aerobically incubated at 25°C. N₂O and CO₂ emissions, mineral N (NH₄⁺-N, NO₃⁻-N), pH, and EC were measured on 0 (start date), 3, 7, 15, 21, 28, and 42 days. Further, gene abundances of ammonia-oxidizing bacteria (AOB) and archaea were estimated.

We observed significant differences in cumulative N₂O and CO₂ emissions among different types of composts. The N₂O emissions were significantly affected by the properties of different soils. Higher soil moisture content increased N₂O and CO₂ emissions. N₂O emissions were mainly driven by nitrification of AOB. In conclusion, differences in compost and soil properties can significantly affect N₂O emissions during aerobic incubation.