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## EFFECTS OF ADDITION OF RED MUD ON EMISSION OF GREENHOUSE GASES AND AMMONIA FROM FULL-SCALE SWINE MANURE WINDROW COMPOSTING

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### Abstract

It is of great concern to reduce greenhouse gases (GHG) and ammonia (NH<sub>3</sub>) emissions from animal manure composting in China. The purpose of this study was to investigate effects of adding red mud on emissions of GHG (methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O)) and NH<sub>3</sub> in full-scale swine manure windrow composting. Two full-scale swine manure windrow composting experiments were carried out to compare emission of GHG and NH<sub>3</sub> with and without addition of red mud. Results showed that the addition of modified red mud reduced N<sub>2</sub>O emissions by 4.03%, however, it did not help reduce CH<sub>4</sub> emissions (51.65% higher than that of the control test). Ammonia emission from both the experimental and the control tests were similar. The addition of modified red mud was useful to conserve nitrogen and phosphorus because the contents of total nitrogen and total phosphorus in the compost of the experiment test were higher than the control test. It was also found that turning was useful to reduce CH<sub>4</sub> emissions, i.e. 51.72% reduction of CH<sub>4</sub> emission after turning compared to before turning. However, turning resulted in an increased N<sub>2</sub>O emission flux by 23.15 times in the experiment test and 15.31 times in the control test, respectively.

*Key words:* ammonia, greenhouse gas, red mud, swine manure composting

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