



1. Title

Mechanism Controlling Greenhouse Gas Emissions from Soils

2. Type

Commission Symposium: Comm. 2.5-Soil chemical, physical and biological interfacial reactions

3. Organizer(s) & Convener

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4. Rationale

Soils affect many of the processes that can mitigate or exacerbate global change. The most important greenhouse gases are carbon dioxide (CO₂), nitrous oxide (N₂O), and methane (CH₄). While these gases have many non-agricultural sources, soil organisms and soil conditions play a major role in the consumption and production of these gases. Soil microorganisms control many of the processes that transform organic C and N into the greenhouse gases (i.e., CO₂, CH₄ and N₂O). Soils can also be either a source (chemical reduction) or sink (oxidation) for CH₄ depending on soil conditions. The balance of these processes and potential of soils to exacerbate or mitigate greenhouse gas concentrations in the atmosphere depends on physical, chemical, and microbiological properties of soils. Judicious management of soils can have a tremendous potential for helping to control or reduce these gases.

5. Objectives

This symposium will highlight mechanisms controlling greenhouse gas (GHG) emissions from soils and provide guidance for dealing with commonly faced problems. Topics to be covered would include scientific mechanisms of major GHGs production and consumption in soil, sustainable soil management for mitigating GHGs emission, new precise technologies for measuring GHGs dynamics from soil, and modeling GHGs emissions.

6. Description

This session will be held with a whole day symposium. In the morning session, the mechanisms of CH₄ production and consumption in soil will be discussed. In the afternoon session, the mechanisms of N₂O production and emission will be deeply handled. In addition, soil management strategies for suppressing each GHG emission will be properly discussed in each session. The first session will begin with the first keynote address on emission and consumption of CH₄ by soils by Dr. Kazuyuki Yagi and will be developed by the second keynote address on methanogenic and methanotrophic pathway on CH₄ production and oxidation by Prof. Dr. Ralf Conrad. This will be complemented by presentation of convener Dr. PilJoo Kim, who will discuss effective mitigation strategy of CH₄ emission from arable soil. The second afternoon session will begin with the third keynote address on global inventories of nitrogen gas emissions by **Dr A.F. Bouwman**. A couple of specialists related to microbial mechanisms of N₂O production and soil management for reducing of N₂O emission will be invited for addressing. Since greenhouse gas emission and global warming study are hot topics at present, a lot of oral and poster presentation request will be expected.

