



1. Title

Modern Soil Biology for N and C Transformation: From Genes to Ecosystems

2. Type

Commission Symposium: Comm. 2.3-Soil Biology

3. Organizer(s) & Convener

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4. Rationale

The microbial transformation of nitrogen (N) and carbon (C) in soil ecosystems is a central issue in soil sciences. Recent significant advances of microbial ecology enable us to decipher real microbial contributions to the N and C transformations in soils.

5. Objectives

To decipher microbial contributions to the N and C transformations in soils, we should identify and analyze key major microbes that transform N and C in soil ecosystems based depending on the environments. The objectives of the session are to discuss (1) how to identify and analyze the key microbes, and (2) how to obtain the general rules of microbial community shifts mediating the N and C transformations in soils.

6. Description

Recently, the evaluations of microbial communities and their functions in situ have been drastically advanced by novel techniques in microbial ecology; metagenomics, microbial genomics, stable isotope analysis, single cell analysis, and so on. A goal is to identify key microbes that really mediate N and C transformation in soil ecosystems such as nitrification, denitrification, methanogenesis, and methanotrophy in the soil environments. In this session, to obtain the profound pictures of the microbial N and C transformation in soil ecosystems, interdisciplinary approaches including soil chemistry, soil biology, and environmental sciences will be introduced and discussed. In particular, one of the preferred topics is microbial N and C transformations relevant to greenhouse gas emission (N₂O and CH₄) in agricultural soil ecosystems.

