

Evaluation of methane oxidizer bacteria in the rice soil in Malaysia

ABSTRACT

Methane is known as a powerful greenhouse gas due to its global warming potential (GWP = 21). Rice fields are methane producers because of the flooding irrigation system. Two microbial communities are involved in methane cycle in the soil including methanogens and methanotrophic bacteria which are responsible for methane production and methane oxidation respectively. Methanotrophic bacteria as aerobic unicellular microorganisms dominantly exist in soil oxic area (e.g. surface of the soil and the rhizosphere). These microorganisms can regulate the methane emission from rice soil. This experiment applied PCR-DGGE to detect methane oxidizer bacteria (MOBs) within the rice soil from two depths 0-5 cm and 5-10 cm in different rice growth stages and cultivation systems. Consequently, several MOBs from type I and type II could be identified. However, type I was detected in depth of 0-5 cm and drained condition rather than 5-10 cm and flooding condition.

Keyword: Methane oxidizer bacteria (MOB); Rice; Denaturing gradient gel electrophoresis (DGGE); Tropical soil