Yukimoto H et al., J Environ Anal Chem 2018, Volume: 05
DOI: 10.4172/2380-2391-C2-006

9th World Congress on

Green Chemistry and Technology

September 17-19, 2018 | Amsterdam, Netherlands

# Enhanced performance of soil microbial fuel cell by earthworms

**Yukimoto H, Ebe S, Ohike T, Okanami M** and **Ano T**
Kindai University, Japan

Currently, energy supply source from fossil fuels have problems such as, depletion of petroleum and greenhouse gas emissions. Under the circumstances, demand for renewable and sustainable energy is increasing and the alternative energy sources other than fossil fuels are expected. Soil microbial fuel cells (SMFCs) are devices that using microbes in the soil as biocatalysts to convert chemical energy to electricity. These are expected as an application to produce sustainable energy. But, it is still a long way to go before SMFC is practically applied. One of the problems is low power generation by SMFC operation. Here, we focused on soil ecosystems, specifically the earthworms which are known to improve soil-fertility by degrading fallen leaves or plant litter and we investigated the effect of earthworm on power generation of SMFC. Earthworms were added to SMFC and the maximum power density and the internal resistance were compared to SMFC with and without earthworms. As a result, the power density was increased by 800% and the internal resistance decreased by 91.5%. The soil structure of SMFC with and without earthworms was different and the clear soil aggregate structure was found in SMFC with earthworms, which had been made with the passage of soil through the earthworm gut. The results indicated that, adding earthworms had a significant effect on the SMFC performance, especially the power and soil structure, and it is suggested that this system would contribute to the sustainable and renewable energy source.

## Biography

Yukimoto H is a graduate student from the Environmental Biotechnology Laboratory of Kindai University in Wakayama. He is under supervision of Dr. Ano. He studies microbial fuel cells.

1733710007j@waka.kindai.ac.jp

## Notes: