Japan Geoscience Union Meeting 2015
(May 24th - 28th at Makuhari, Chiba, Japan)

AGE04-P10 Room:Convention Hall Time:May 24 18:15-19:30

Measuring Fresh and Old Organic Matter Contents in Degraded Soils using FTIR spectroscopy.

MORIWAKE, Shuichi[1*] ; NASU, Yoko[1] ; MORI, Yasushi[1]

[1]Graduate School of Environmental and Life Science, Okayama University

Soil is the largest of all terrestrial carbon stores, and it also have important functions such as water storage and plant support roles. However, soil run-off by climate change and changing farmland management has caused decrease of soil organic matter (SOM).In our previous research, we have successfully introduced surface organic matter into soil by enhancing infiltration and stimulate vegetation growth. It would be useful if we could distinguish the contribution by fresh plant and SOM.In this study, we applied Fourier transform infrared (FTIR) spectroscopy for measuring SOM.

We mixed about 0-5 % of cellulose (assuming plant root) and humic acid (assuming soil organic matter) by the carbon weight with Toyoura standard sand or Bentonite. Diffuse reflectance was employed and peak area was measured for estimating organic matter content. IR spectrum revealed that good correlation was obtained with 3450 and 2900^{cm-1} for cellulose and 2600cm^{-1} for humic acid. Finally, we measured independent organic matter contents of cellulose and humic acid using mixed organic matter of cellulose and humic acid, which was assuming field application. Estimation of carbon contents was well for cellulose when designed concentration was less than 2%, regardless of humic acid concentration. On the other hand, humic acid was well described for concentration more than 3%.We could obtain preliminary results toward characterizing the organic matter content in the field by distinguish the contribution by fresh organic matter and soil organic carbon.

Keywords: FTIR spectrums, soil organic matter, soil carbon