

Characterization of copper binding properties of dissolved organic matter (DOM) from biochar-amended compost using two-dimensional correlation spectroscopy (2D-COS)

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Backgrounds

Biochar (BC) application to soil is known to be beneficial to agriculture. However, much remained question regarding the properties and the environmental roles of DOM leached from the BC-applied field. Thus, it is important to explore the characteristics of DOM derived from BC-amended composts and its environmental influence such as the interaction with metals.

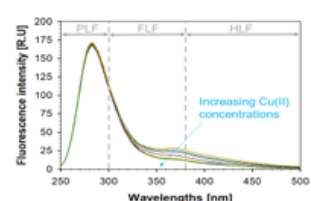


Figure 1: Changes in the synchronous fluorescence spectra of DOM derived from BC-amended compost with the addition of copper.

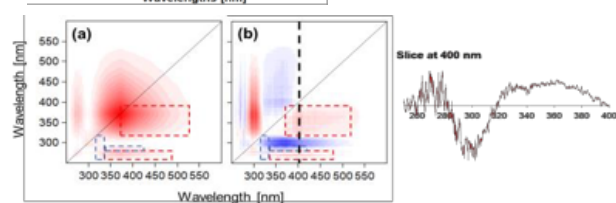


Figure 2: Synchronous (a) and asynchronous (b) maps of BC-compost mixture DOM incubated for 6 months

Results and Discussion

According to Noda's rule [1], fluorescence quenching occurred in the order of 375-520 nm → 260-320 nm → 340-475 nm. The results suggest that copper binding of the BC-compost DOM was stronger in the order of humic-like (HLF), protein-like (PLF), and fulvic-like (FLF) fluorescence.

[1] Noda, I. (2016) Two-dimensional correlation spectroscopy study (2DCOS) analysis of polynomials, *J. Mol. Struct.* **1124**, 53-60