## The sorption and desorption of organic carbon onto tropical reclaimed-mining soils with coal fly-ash application

## Akhmad R. Saidy<sup>\*</sup>, Bambang J. Priatmadi, Meldia Septiana, Afiah Hayati

Department of Soil, Faculty of Agriculture, Lambung Mangkurat University, Jalan Jenderal Achmad Yani KM 36 Simpang Empat Banjarbaru 70714, South Kalimantan, Indonesia

\*Corresponding author: asaidy@ulm.ac.id

**Abstract:** Coal fly ash, resulted from coal combustion in power plants, with relatively high amounts of aluminium, iron, calcium, and magnesium oxides may modify the sorption capacity of soils. A batch experiment was conducted to examine the capacity of reclaimed mining soils (RMS) to adsorb organic carbon (OC) in response to coal fly ash application. Extraction of dissolved OC was carried out from dried albizia shoot residue and reacted with the RMS at dissolved OC concentrations varying from 0 to 175 mg C L<sup>-1</sup> at pH 5.5. The results showed that the sorption capacity of the RMS for OC increased significantly with coal fly ash application, which may relate to increasing the contents exchangeable Ca and Mg, dithionite– and oxalate–extractable aluminium and iron, and surface areas of soils. Desorption experiment indicated that only 5–23% of the OC initially sorbed onto soil–coal fly ash interactions was freed using a single extraction step, suggesting that most of the OC is strongly sorbed to the mineral surfaces. Results of the study indicate an important role of fly ash in increasing OC sorption capacity of soils and reducing the percentage of OC sorption from the RMS–coal fly ash association.

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