

Organic-mineral complex protection of BC as revealed by BPCAs

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In this study, the benzene-polycarboxylic acids (BPCAs) were compared before and after mineral removal in clay fractions (< 2 μm) of soil NP (natural soil) and P55 (paddy soil for 55 years) profiles. The results showed that the sum of BC after mineral removal increased greatly and individual BPCA molecules also increased. This result suggested the protections of BC in organo-mineral complexes. The extent of BPCA increase in NP was generally higher than that of P55, probably because of long-term intense tillage resulted in the break down of BC-mineral interactions. Through particlar size analysis and X-ray diffraction analysis, we found that BC amount and BPCA molecule increase after mineral removal is significantly related to the content of clay minerals. This result suggested that organo-mineral complexation is involved in BC stabilization, and the content of clay minerals is important in this process.

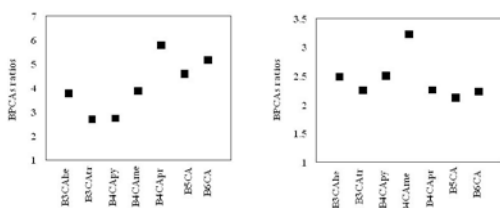


Figure 1: The concentration ratios of BPCA molecules after and before mineral removal for topsoils of NP (left) and P55 (right).

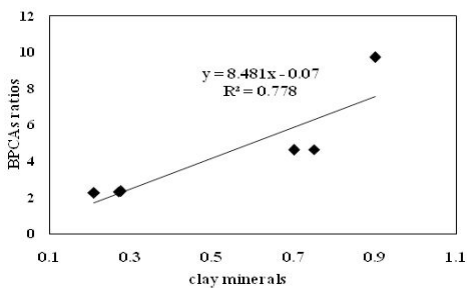


Figure 2: BPCA concentration increase ratios after mineral removal are positively related with content of clay minerals.