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## Effects of vegetation restoration on soil organic carbon redistribution along the Loess slope

**Xiaoxia Zhang**, Xiang Li, Yipeng Liang, and Tonggang Zha  
(zhangxx0708@bjfu.edu.cn)

Soil organic carbon (SOC) redistribution along the Loess slope under the effect of soil erosion plays an important role in understanding mechanism of SOC spatial distribution and turnover, hence to its effects on global carbon cycle. Vegetation restoration has been taken as an effective method to alleviate soil erosion on the Loess Plateau, while little research focused on the impact of vegetation restoration on the redistribution processes, especially the spatial distribution and stability of SOC. Here, we quantified the SOC stock and pool distribution on the loess slopes along geomorphic gradients under naturally regenerating forests (NF) and artificial black locust plantation (BP), using corn field as a control (CK). The results were as follows: (1) vegetation restoration, especially NF, effectively slowed down the migration of SOC resulting from soil erosion and reduced the heterogeneity of SOC distribution. The ratios of topsoil SOC in the sedimentary area to the stable area were 109%, 143%, and 210% under the NF, BP, and CK, respectively. And (2) Vegetation restoration reduced the loss of labile organic carbon by alleviating the loss of dissolved organic carbon (DOC) and easily oxidized organic carbon (EOC) during migration. Both DOC/SOC and EOC/SOC ratios under NF and BP presented far less differences between the sedimentary and erosion zones than CK. A schematic diagram of SOC cycle patterns and redistribution along the loess slope under vegetation restoration based on our findings and discussions. The results suggested that vegetation restoration in the Loess slope, NF in particular, was an effective means for alleviating the redistribution and spatial heterogeneity of SOC and reducing soil erosion. Information from this study is useful for understanding the carbon cycles in restored ecosystems and evaluating the ecosystem services of natural and managed forests in soil erosion control and carbon sequestration.