

# Response of soil aggregate disintegration to the different content of organic carbon and its fractions during splash erosion

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## Abstract

Aggregate disintegration is a critical process in soil splash erosion. However, the effect of soil organic carbon (SOC) and its fractions on soil aggregates disintegration is still not clear. In this study, five soils with similar physical and chemical properties and different contents of SOC have been used. The effects of slaking and mechanical striking on splash erosion were distinguished by using deionized water and 95% ethanol as raindrops. The simulated rainfall experiments were carried out in four heights (0.5, 1.0, 1.5, and 2.0 m). The result indicated that the soil aggregate stability increased with the increases of SOC and light fraction organic carbon (LFOC). The relative slaking and the mechanical striking index increased with the decreases of SOC and LFOC. The reduction of macroaggregates in eroded soil gradually decreased with the increase of SOC and LFOC, especially in alcohol test. The amount of macroaggregates (>0.25mm) in deionized water tests were significantly less than that in alcohol tests under the same rainfall heights. The contribution of slaking to splash erosion increased with the decrease of heavy fractions organic carbon (HFOC). The contribution of mechanical striking was dominant when the rainfall kinetic energy increased to a range of threshold between 9 J m<sup>-2</sup> mm<sup>-1</sup> and 12 J m<sup>-2</sup> mm<sup>-1</sup>. This study could provide the scientific basis for deeply understanding the mechanism of soil aggregates disintegration and splash erosion.

## Title:

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Running title:

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