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Investigating the effects of bryophytes on carbon cycling in a temperate forest ecosystem from stable isotope composition

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Mosses increase soil organic carbon, which changes carbon isotopic signatures, aggregate sizes and erosivity

Moss-covered soils have higher carbon contents, bind larger soil aggregates, and are thus more resistant to soil erosion

moss–covered soil (mc)

>

non-covered soil (nc)

>

disturbed soil (dist)

Experimental Setup

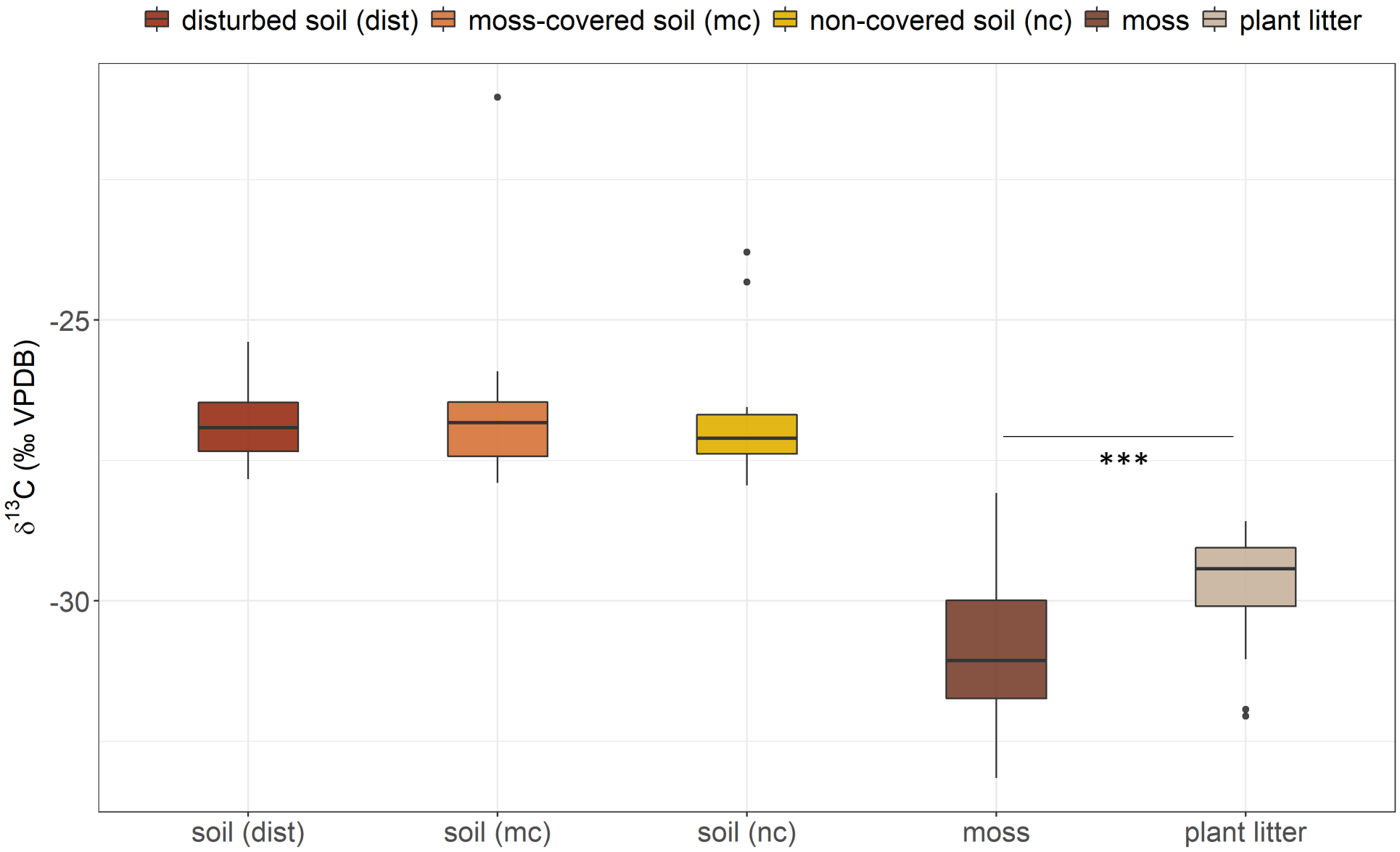
Carbon Content
elemental analyser (vario EL III; Elementar, Hanau)

Stable carbon isotope ratios
isotope-ratio mass spectrometer (vario ISOTOPE cube, isoprime visION; Elementar, Hanau)

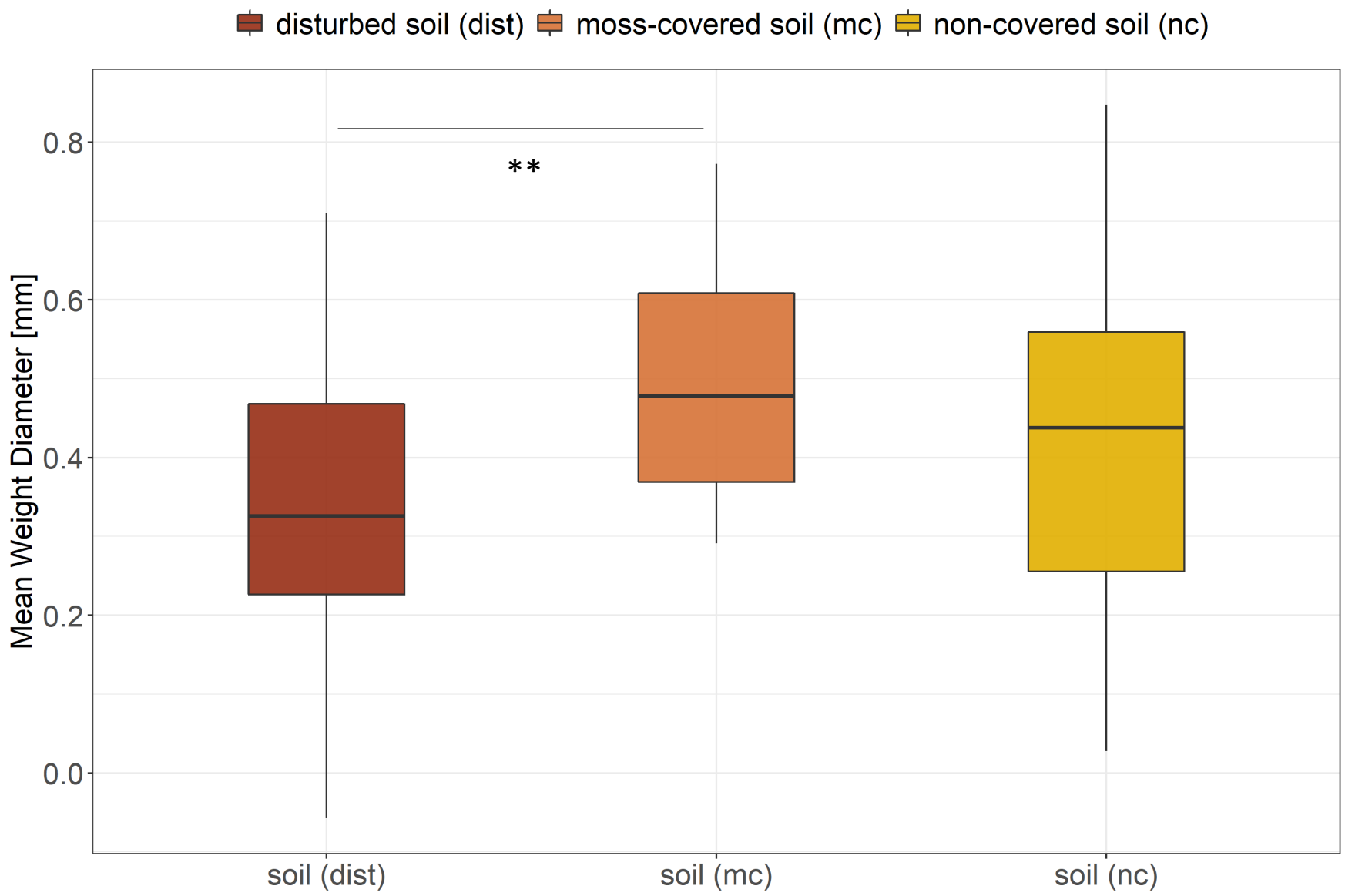
Average aggregate size
Wet sieving

Erosivity
Rainfall simulation
Drop fall height 3.5 m
I = 60 mm/h
Portable protective tent

$\delta^{13}C$ (‰ VPDB)



Average aggregate size



Conclusion

No significant differences in average carbon content, carbon isotope signature and erosivity between soil treatments

Two sites show significant differences in carbon contents & carbon isotope signature between soil treatments

Due to decomposition the detection of a direct impact of mosses on soil organic ^{13}C composition was not possible

Moss-covered soils show on average larger soil aggregates than disturbed soils

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Thank You!

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