



## **Environmental factors regulating soil organic matter chlorination**

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Natural chlorination of organic matter is common in soils. Despite the widespread abundance of soil chlorinated soil organic matter (SOM), frequently exceeding soil chloride abundance in surface soils, and a common ability of microorganisms to produce chlorinated SOM, we lack fundamental knowledge about dominating processes and organisms responsible for the chlorination. To take one step towards resolving the terrestrial chlorine (Cl) puzzle, this study aims to analyse how environmental factors influence chlorination of SOM. Four factors were chosen for this study: soil moisture (W), nitrogen (N), chloride (Cl) and organic matter quality (C). These factors are all known to be important for soil processes. Laboratory incubations with  $^{36}\text{Cl}$  as a Cl tracer were performed in a two soil incubation experiments. It was found that addition of chloride and nitrogen seem to hamper the chlorination. For the C treatment, on the other hand, the results show that chlorination is enhanced by increased availability of labile organic matter (glucose and maltose). Even higher chlorination was observed when nitrogen and water were added in combination with labile organic matter. The effect that more labile organic matter strongly stimulated the chlorination rates was confirmed by the second separate experiment. These results indicate that chlorination was not primarily a way to cut refractory organic matter into digestible molecules, representing one previous hypothesis, but is related with microbial metabolism in other ways that will be further discussed in our presentation.