Plant wax isotope signatures of neotropical vegetation biomes in soils across Brazil

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The stable carbon ($\delta^{13}C$) and hydrogen (δD) isotope compositions of plant waxes such as long-chain *n*-alkanes and fatty acids are frequently used to reconstruct past climate and vegetation from sedimentary archives. Differences in regional vegetation structure and evolutionary history require a local understanding of these proxies, which is so far missing for neotropical savannas. To determine the isotope signature of neotropical vegetation types, we analyze the $\delta^{13}C$ composition of plant waxes and bulk organic material and the δD values of plant waxes from soil samples from the most important South American vegetation types including the Amazon rainforest, Atlantic rainforest, and Cerrado. While we find the expected higher soil and plant wax $\delta^{13}C$ values in open Cerrado vegetation, dense Cerrado vegetation (Cerradão) can yield $\delta^{13}C$ values that are indistinguishable from the Atlantic rainforest. Conversely, we find that $\delta^{13}C$ values in the Amazon rainforest are lower than in the Atlantic rainforest and the Cerradão, which we attribute to greater canopy closure (trapping respired, ^{13}C-depleted CO_2) achieved in the multi-layered Amazon canopy structure. Today, precipitation isotopes are invariant across the region and preliminary δD results from soils show no major systematic changes in plant wax δD values across the region or fractionation between the different vegetation types. These results calibrate plant wax proxies for reconstructions of past vegetation type and density in tropical South America, as well as reconstructions of precipitation δD.