

Interactive comment on “Understanding the effects of early degradation on isotopic tracers: implications for sediment source attribution using compound-specific isotope analysis (CSIA)” by Pranav Hirave et al.

Anonymous Referee #2

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Review comments on: “Understanding the effects of early degradation on isotopic tracers: implications for sediment attribution using compound-specific isotope analysis (CSIA) By Hirave et al.

The authors have made an attempt to fingerprint organic matter source using compound-specific isotope ratio measurement of organic matter from forest soil. They have tried to understand the degradation of fresh organic matter and change in carbon isotope ratios of n-alkane and long-chain fatty acids in different forest soil. The manuscript has reasonably well written. However, the authors may kindly address the

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following issues for better clarity.

1. Introduction: Authors have started this section by introducing the causes of fresh ecosystem degradation as result of nutrient input along with detrital riverine/ aeolian input. However, they ended up with the determination of organic matter sources and extent of degradation in a soil horizon. The connectivity between organic matter source and concerned with freshwater ecosystems has not been addressed. This aspect needs to be elaborated in the discussion or modify the introductory part for better coherence.

2. Methodology:

A. Why inorganic carbon was not removed from the soil prior to bulk carbon isotope ratio measurement? B. What is the recovery % of short and long-chain compounds in the entire extraction process? C. How the methylation correction was applied for carbon isotope ratio measurement? Which formula was used and how the alcohol isotope ratio was measured?

3. Result: A. The best way to show the result is against the respective soil profiles. The different zone identified in the different soil profiles can also be marked for clarity. B. What is LB pruce*? C. At many places, you are writing $\delta^{13}\text{C}$ enrichment or depletion!! Please write an ‘increase in $\delta^{13}\text{C}$ or ‘enrichment of ^{13}C ’. D. Why moss values are neglected? Why the significantly low $\delta^{13}\text{C}$ values? 4. Discussion: A. Why the bulk $\delta^{13}\text{C}$ and is showing ^{13}C enrichment? Compared to the nC28 and nC29 B. Is the true for other long-chain fatty acids and alkanes as well?

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