

Interactive comment on “Stable isotope ratio ($^{13}\text{C}/^{12}\text{C}$) mass spectrometry to evaluate carbon sources and sinks: changes and trends during the decomposition of vegetal debris from eucalyptus clone plantations (NW Spain)” by I. Fernandez and A. Cabaneiro

Anonymous Referee #1

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The authors report data from an laboratory incubation study with aboveground plant litter from two eucalyptus clones samples from plantations on different bedrock. The authors intend to elucidate biodegradation of both clones and to evaluate their half-lives. For this purpose the authors monitor mineralisation as well as the isotopic signature of CO₂ evolved. The authors conclude upon the isotopic differences of evolved CO₂ at the beginning of incubation between the two clones probably related to genotypical differences, which should not be neglected when attempting to get reliable estimates

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of the contribution of decaying vegetal debris to SOM buildup.

I cannot recommend the publication of this manuscript, because the conclusion about isotopic difference, which is the main focus of this manuscript is based on a difference <0.5 per mil. – This is within the instrumental error! Carbon mineralisation of litter from both clones was similar and therefore it is questionable that this small difference in isotopic composition of evolved CO₂ at the beginning of the incubation has any significance for biogeochemical C cycling. Moreover, the authors consider that aboveground litter fall is controlling SOM built up. This may however be far from accurate, as belowground plant litter may be much more important. Moreover, litter decomposition was assessed under complete artificial conditions (in the laboratory, without soil and plants). Therefore it is highly questionable is such an incubation will yield any valuable information about degradation in the field, which the authors claim to be important knowledge gap. The degradation behaviour in the field may be better assessed by a litterbag study.

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