

Interactive comment on “Physical and chemical characterizations of biochars derived from different agricultural residues” by K. Jindo et al.

K. Jindo et al.

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We thank Referee #2 for comments and suggestions, all of them have been considered in order to improve the quality of this paper. The comments of Referee#2 are relevant and reasonable. All our response for comments of the Anonymous Referee #2 was described as following:

1. Remarks from Referee#2

In my opinion this article does not suit the aims and scope of biogeosciences. Different temperatures can alter the characteristics of biochar. But what is the implication that this has in the soil biogeochemistry or soil microbiology? This article is much more suited for a journal focused on pyrolysis like Journal of Analytical and Applied Pyrolysis.

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The article is not very well written, both with numerous grammar mistakes. See, for example, lines 11 and 21 in the abstract or the first line in the introduction. In many instances there are also inadequate links between ideas. The authors conclude that low temperature biochars are better for soil microbial population potential for carbon sequestration. There is not the level of novelty required to publish in Biogeosciences.

Response: First of all, we appreciate Referee #2's comments, which encouraged us to reconstruct the manuscript for making clearer the focus of our work and also to upgrade the manuscript quality. We have now rewritten the aim of the manuscript (the last section of the introduction) to highlight the relevance of our work to the scope of the journal. The main aim was to optimize the physicochemical properties of biochar, prepared from different residual materials as feedstocks in order to enhance their potential as organic amendments and to interact with the different soil biogeochemical cycles. We hope that the new version clearly highlights the relationship of the paper to the following scope of the journal “Biogeochemistry and global elemental cycles”. In addition, we have included further characterization of the biochars in order to evaluate their stability in soils. The ash content of biochar and the thermal analysis are added to our study. These data manifest the differences of the properties with more details. Concerning of the use of English, we made a deep revision of the manuscript and ask for professional editing services (Editage) to revise our whole manuscript including tables and figures. We have amended the sentence in the conclusions, and we have reviewed the entire manuscript to clarify well known concepts and the main contributions of this paper.

2. Specific comments:

Page 11728, lines 1-6: This is mentioned only in the abstract and not in the introduction section. Lines 20-21: This is never proved in this article. These constitute examples of inadequate links between ideas.

Response: We agree with the reviewer and we have focused the abstract on the novelty

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of the paper, rather than introducing the research topic.

Page 11729, line 10: This reference is a very poor choice here. Lammirato did not measure any indicator related to plant performance. Line 20: "Eucalyptus"

Response: We appreciate the clarification and, accordingly, we have replaced the reference by Lammirato et al, 2011. We choose other references, relating to the experiment of plant growth (Robertson et al., 2012) and the nutrient release from biochar (Mukherjee and Zimmerman, 2013). "Eucaryptus" was corrected to "Eucalyptus".

There is a lack of hypothesis in the introduction. It is not clear what the authors aim to learn from this experiment. In addition they justify the use of rice husk and rice straw, but not other materials.

Response: The revised version of the introduction was intended to better explain the aim of the paper. However, as suggested by the referee, we also included a statement with the hypothesis of the manuscript to justify how the different properties of the feedstock would determine the behavior of biochar in soil and the impact on soil biogeochemical cycles. Justification of the use of apple pruning woodchip and the oak tree, as the reference as the hard-wood material was added.

Page 11730, line 8: What was the approximate size of the pieces? This has important implications for the pyrolysis process.

Response: We agree with reviewer. The size of the pieces was less than 4–5 cm. The description was added in the manuscript.

Page 11732, lines 17-19: This is highly speculative. Lines 24 to end of the page: This is again highly speculative. How would Si content affect the pyrolysis process?

Response: The sentence on the page 11732, lines 17-19, was omitted, and the sentence from Line 24 to end of the page was rephrased. A description of Si content during the pyrolysis process was added in the manuscript and supplementary data on elemental composition of biochars produced at 800 °C, including the Si content, is now

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shown.

Page 11733, lines 7-9: This sentence is really difficult to understand. It needs serious re-writing.

Response: The sentence was rewritten.

Page 11736, line 1: As substitute for what?

Response: It was error. It should be "substrate".

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