



## Comment on soil-2021-145

Anonymous Referee #2

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Referee comment on "The application of biochar and oyster shell reduced cadmium uptake by crops and modified soil fertility and enzyme activities in contaminated soil" by Bin Wu et al., SOIL Discuss., <https://doi.org/10.5194/soil-2021-145-RC2>, 2022

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**Review Paper Title: The cooperative application of oyster shell and biochar efficiently enhanced in-situ remediation of cadmium contaminated soil around intensive industry.**

### General comment:

The manuscript discusses the effects of biochar and oyster shell, added into rice-oilseed rape system, on the remediation of cadmium in contaminated soil and reduction of the element in the crops. This manuscript also evaluated the potential health risk from cadmium in the crops grown in the amended soils. This is quite a good piece of work; however, this paper largely lacks coherence with the objective(s), and needs more attention to its writing style and discussion in support of the results observed. This manuscript mainly emphasizes that the cooperative application of biochar and oyster shell is the most effective means for remediating cadmium in contaminated soil, in terms of reducing cadmium bioavailability in soil and cadmium uptake by plants as well as improving a number of soil quality parameters; however, these are indeed not reflected by the results (data/figures). Rather, the sole application of oyster shell, the cheaper one, appeared to be more effective compared to the joint application of biochar and oyster shell. Major revisions are necessary in many cases (please see the specific comments). The discussion section must be re-written, focusing on well constructive explanations; this part should be coherent and readable. In addition, all the references need to be corrected following the journal style. This manuscript may not be considered for publication; however, for a positive decision, significant improvements, and justification with the results in the highlighted contexts must be done, carefully considering the specific comments through major revisions.

### Specific comments

- **Abstract:**

Line 30-32. Please rephrase the sentence.

Lines 32-38. Please rephrase this part, with clear treatment combination. It seems that the treatments were applied twice for the two different crops, but this was not the case. The repetition of "followed with" should be avoided.

Line 38. Please indicate what the HOAc-extractable Cd means (like, bioavailable or so). Please use a single style for stating "HOAc-extractable Cd". This is written in a different way at the line numbers 137 (acetic acid), 197, 315..... Also, what is the significance of only mentioning about Cd reduction in R-PA2 in the abstract?

Line 38. ... compared to control.

Line 38-44. What is the significance of these observations – please link.

Line 45. Joint, not jiont. Please check this spelling in other places also.

Line 47. How is the joint application more effective than the sole applications of biochar and oyster shell, while the results don't show any significant differences?

- **Introduction**

Line 52-53. Please rephrase the sentence, appropriately linking the second part.

Line 56. ... has been ranked ....

Line 66. In recent years, ..... bio-wastes has been widely ....

Line 68. Please use either 'and' or 'etc'.

Line 71. Limited or limits?

Line 72-74. Please rephrase this sentence. What is meant by "...not very significant"? Please write acidic instead of acid.

Line 76-78. Please rephrase this sentence. 'that' to be removed, and 'which' to be added between alkaloid and has.

Line 81. There is little known....

Line 83. ... are the main food...

Line 85-87. Please give references for the previous studies. Please write "rice-oilseed rape".

Line 87. Based on the above...

Line 87. ... a field experiment, not filed.

Line 92. Alkeline-N or Alkaline-N? Please check this throughout the manuscript.

Line 93. PCA is generally used for Principal Component Analysis. PCA here should be avoided.

▪ **Materials and methods**

Line 103. Table S1 is missing.

Line 115 & 119. "passivators" may be replaced with a more appropriate word. However, the 'passivators' are not specified before.

Line 137. Please see the comment made before; compare with the line no. 38....

Line 141. Alkeline-N or Alkaline-N? Please check the reference Liu et al. 2017 to confirm its content about the determination of alkaline-N.

Line 142. TOC and OM should be indicated in full within (). (Walz et al., 2017) should be written as Walz et al. (2017). Please follow this style for other instances; e.g., in line no. 141.

Line 155. Human health risk....

Line 155. Please use a single format – either 'Cd' or 'cadmium' throughout the manuscript.

Line 156. The health risks of Cd to adults and children in the crops... - this part of the sentence should be revised.

Line 157. Please define Hazard Quotient – what it indicates actually.

Line 158. Please write HQ in full when it is in the beginning of a sentence. Please follow this for other cases throughout the manuscript.

Line 159. calculated using the following equation:

Line 160. (1) can be removed.

Line 161. Please write "where," beforehand.

Line 174. What is actually meant by "all statistics"? Should it be graphical interpretation or so...?

▪ **Results**

Line 175. 'Results' only.

Line 180. OM is generally expressed in %.

Line 182. Please rephrase. What is indicated by 'reached' here?

Line 197. Please see the comment made before; compare with the line no. 38....

Line 197-198. The second part of the sentence should be in the discussion section. Please use reference(s) for such statement.

Line 200. ... flooding irrigation... Please use one.

Line 212-213. Not true. Please rephrase with actual observations from the figure.

Line 213-214. Please rephrase "treatments without amendments". Please check the Figure 3a to confirm the value 0.88 mg/kg.

Line 216. ... oyster shell had the ....

Line 220. Oilseed Cd content in RT-PA3 was not significantly lower than that in the Control. Please check and amend.

Line 221. "The results indicated that biochar and oyster shell application..." – sole application or combine application?

Line 224. Please write HQ in full as in the beginning of the sentence.

Line 224-225. This sentence can be removed. Rather, 'Figure 4' can be written at the end of the sentence in line no. 227.

Line 226. .... adult female > adult male, which indicated that children were....

Line 226. Please use a more appropriate word for 'sensitive'.

Line 228. ... HQ values of consuming brown rice for adult male, adult female and children reached 5.46, 6.21 and 6.82, respectively. – What does it mean by "reached"? Is this the max value for a certain group? Moreover, the values given here do not match with the observations in the Figure 4a. Please check and amend clearly.

Line 229. ... HQ values for brown rice intake...

Line 229-231. Please rephrase. The decrease in the HQ values for which group(s) – adult male female or children?

Line 231-233. Please rephrase. What does the "significantly" mean here?

Line 237. It should be Figure 5a, not 2a.

Line 239. Please avoid using 'points' for indicating the pH values.

Line 240. slightly, not slight.

Line 241. CEC of soil....

Line 242. Figure 5b, not 2b.

Line 244-245. This is irrelevant here.

Line 247. Table S2 is missing.

Line 260-262. Please rephrase.

Line 262-264. Please rephrase.

Line 265-266. Please rephrase.

Line 267. .... biochar had no negative ...

Line 269-270. Please make it clear whether it was individual application of the treatments or combined application.

Line 274. Please rephrase "to experimental data".

Line 275. Pearson correlation value is expressed by 'r'. Please check this throughout the manuscript.

Line 278. The Figure 7b....

Line 278. .... Cd uptake by oilseed rape ....

Line 282. Acidic

Line 287. (detailed information see Supplementary Information) – should be written in an appropriate way. There is no SI attached with the manuscript.

Line 288. The dosage of application was 15 t/ha, i.e., 15000 kg/ha. So, please review this amount and also the calculated cost in line numbers 289 & 290.

Line 289-290. joint

Line 291. Please amend the sentence as ‘... biochar and oyster shell was found to be more effective...’. Again, how this was more effective than the individual applications? The use of oyster shell alone had either similar effects or its effects were not significantly different than the joint application. Moreover, oyster shell is much cheaper than biochar, and thus, compared to the combined use.

Line 292-294. Should be in the discussion section.

## ▪ Discussion

Line 296. .... are the most ...

Line 303-304. Please use a reference for this statement.

Line 305. .... have...

Line 306. ... had ...

Line 306. Please give references for the previous studies.

Line 307. Please rephrase the sentence.

Line 310. But the reductions in Cd were not statistically significant compared to the control treatment.

Line 311-314. Please rephrase.

Line 315. Please use an appropriate word for “has” here.



Line 315-326. Please rephrase with constructive discussion in the context.

The discussions are mostly linked to the pH; however, the pH for oyster shell and combined treatment are not significantly different, and so the effects due to pH as well. How can this strongly support the joint application over oyster shell alone? The authors can also highlight the benefits of using biochar with oyster shell linking with different other factors.

Line 337. Please write 'P' in full in the beginning of the sentence.

Line 345. Please avoid the use of "PCA".

Line 350-352. Please rephrase.

Line 354. Please use appropriate words for 'obvious' and 'stimulation'.

Line 354-355. Please either remove this sentence or rephrase.

Line 357. Please add year for the reference used, and remove the reference written at the end of the sentence in the line no. 358.

- **Conclusions**

Lines 372. Please use a more appropriate for 'extraordinary' here?

Line 378. .... our, not Our.

- **Others**

Figure 7. The values on the figures are not clear.

- **References**

Please follow the journal style of referencing in the reference section. All the references need to be corrected following the journal style. So, please check and amend throughout the reference section.