

## ***Interactive comment on “Particles under stress: Ultrasonication causes size and recovery rate artifacts with soil derived POM, but not with microplastics” by Frederick Büks et al.***

**Anonymous Referee #2**

Received and published: 14 September 2020

General comments: This paper reports a study on recovery rate and change in size distribution of soil oPOM, pyrochar, and microplastics under a series of ultrasonication treatments. It is shown that while ultrasonication is widely used in soil particle fractionation, it may cause artifact and false estimation of POM stability even with low power. For microplastics, both recovery rate and size distribution are not significantly changed by ultrasonication treatment. The results are valuable for both soil aggregate-related researches and microplastics studies. However, the study needs some essential data to support its conclusion and explanation of the results.

Specific comments: 1. For oPOM and pyrochar, the recovery rate decreased with the

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increment of ultrasonication power. The cause was supposed to be an increase of new active surface to absorb the comminuted oPOM after disintegration of soil aggregates. However, this explanation is unlikely applicable to pyrochar. 2. As mentioned in Ince (2001) and confirmed in Kaiser & Berhe (2014), ultrasonication induced high temperature may reduce total C content due to oxidative reactions. If this happens, the conclusion of “counting up to around 36.2 to 64.2 % of POM to the MOM” is really overestimated. I would like to know how much oPOM was lost and how much was transferred to MOM in this study. 3. In line 149, “About 100 mg POM were suspended” for particle size analysis. However, the initial quantity of oPOM in each vessel is  $20 \text{ g} \times 0.5\% = 100 \text{ mg}$ . Therefore, with a recovery rate may be as low as 50%, it is unlikely to get 100 mg of oPOM for particle size analysis. 4. The farm and forest soils used for this experiment were from an organic horticulture and a spruce/beechn mixed forest. However, soil organic C content was only 4.9 and 7.3 g kg<sup>-1</sup>. Please check these data. 5. Is the weight of POM measured or the C content measured? 6. There are some grammar errors, including explanation of the calculation of CF.

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Interactive comment on Biogeosciences Discuss., https://doi.org/10.5194/bg-2020-204, 2020.

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