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Interactive comment on "Global concentrations of microplastic in soils, a review" *by* Frederick Büks and Martin Kaupenjohann

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Dear referee #2

Thank you very much for that appreciating and motivating report.

Line 85: The aim of this review is to collect data about common soil MP concentrations, sizes, shapes and types under the influence of different anthropogenic parameters." I think the article goes further so I suggest improving this sentence.

-> We propose to add "... discuss the robustness of these data and give recommendations for future experiments."

Based on the authors experience: could they add a table summarizing the pros and

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cons of each method for measuring MP in the soil.

->We add to line 540 "The compatibility of the underlying procedural steps with given requirements is listed in Table 2.“ and add a new table, which you can find attached.

Line 365-370 “...which increase with the number of sewage sludge applications (Corradini et al., 2019; Crossman et al., 2020; van den Berg et al., 2020)”. What is the frequency of sewage adding?

-> The frequencies are now mentioned in line 295 "... after two applications within 5 years.“ (Crossman et al., 2020) and line 304 "... was 1-5 times applied with an annual rythm and amount of ...“ (Corradini et al., 2019). The frequency in van den Berg et al. (2020) is already described in line 245.

Line 438 “Only 15 % of the sites are described sufficiently by means of soil texture or soil type..” Was there any other information about soil characteristic beside texture, such as carbon concentration, macro-micro fauna activity, . . .? and how each parameter could be linked to MP concentration? If so it would be interesting to mention it if such data exists in the literature.

->We would like to add to line 442: "Data on further parameters such as soil carbon content, micro- and macrofaunal activity, that are found to affect the aggregation, transport, comminution and decay of microplastics (Büks et al., 2020a), are largely missing.“

Best regards,

Dr. Frederick Büks and Prof. Dr. Martin Kaupenjohann

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Table 2: Evaluation of procedural steps used for the extraction of microplastics from soil. Extraction methods, additional treatments and methods for measurement appear in various combinations. Their compatibility with given requirements is shown based on the reviewed literature. Question marks indicate unknown performances, ρ refers to the density cut-off in g cm^{-3}, OM refers to organic matter, PFE refers to Presurized fluid extraction, FTIR refers to Fourier-transform infrared spectroscopy, Pyr-GC-MS refers to Pyrolysis–gas chromatography–mass spectrometry and TED-GC-MS refers to Thermal extraction and desorption–gas chromatography–mass spectrometry.

		increased yield of extraction	increased co-extraction of OM	co-extraction of mineral phase	determination of item number / size / shape	determination of MP mass	determination of plastic types	determination of MP surfaces
oxidation of natural OM	pre-oxidation	yes	?	?	yes	yes	yes	?
	post-oxidation	no			yes	yes	yes	?
extraction method	mechanical treatment	yes	yes	no	?	yes	yes	?
	density fractionation	≥1.6	~ρ	>1.6	yes	yes	yes	yes
	PFE	yes	?	no	no	yes	yes	no
measurement	light microscopy				yes	StM	no	no
	FTIR / Raman spectroscopy				yes	StM	yes	no
	Pyr-GC-MS / TED-GC-MS				no	yes	yes	no

Fig. 1.

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