

Biogeosciences Discuss., referee comment RC1
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Comment on bg-2021-117

Anonymous Referee #1

Referee comment on "Mercury accumulation in leaves of different plant types – the significance of tissue age and specific leaf area" by Håkan Pleijel et al., Biogeosciences Discuss., <https://doi.org/10.5194/bg-2021-117-RC1>, 2021

The manuscript is less innovative and rely on basic, although competent methods and analysis. The manuscript is merited for publication mostly for its scope including experimental data from temperate and tropical ecosystems.

I recommend publication with the proviso that the authors take turns revising the manuscript according to the comments below.

General comments:

In general, the authors seem less up to date with the research front and the choice of references may seem somewhat dated. This is especially true of the obvious achievements made with stable isotope analyzes and paradigm shifts that affect the view of the mercury cycle in terrestrial ecosystems.

Specific comments:

L69: I recommend e.g. Yang et al. PLOS ONE 2018 instead of Fleck et al. (1999) for wood analysis.

L74: Yuan et al. says that re-emission is only partially counteracting uptake. There is no

contradiction between Yuan et al. and Lindberg et al. (the latter is an old reference that hardly belongs here. Perhaps Bishop et al. and / or Sommar et al. both STOTEN 2020 should be referenced here) and it is difficult to understand that "however" is used in the following sense. Revise L74 - L77.

L77: The sentence is grossly misleading. It points out the need to quantitatively examine re-emissions without mentioning that the study totally ignores doing so.

L255: "... significant... analysis.". Can this sentence be rewritten to be easier to understand?

Fig. 5a Spelling "agee".

L337 and on: The discussion is very long without the reader being informed that there are several studies that clearly report the global distribution of atmospheric Hg uptake into vegetation and that especially the subtropics / tropics are important (eg Wang et al. 2016 EST and others). Instead, the discussion tends to delve into individual studies with unnecessary verbosity instead of measurement data being inserted and discussed in the context of the current state of knowledge (for example reported in Obrist et al. 2018 Ambio). The manuscript benefits from a sharp revision of the discussion.

L365: Here the authors' opinion from L74- is repeated. It must be said that the manuscript's lack of air analyzes is not meritorious. In what appears to be an attempt to reverse the perspective that empirical data are not compatible with extensive bidirectional exchange, a number of studies are discredited here that elegantly use stable isotope analyzes (e.g. Demers GBC 2013, Zheng GBC 2016 and Yuan EST 2019) to clearly demonstrate the importance of re-emissions from foliage. It can be repeated that the isotope studies in no way contradict continuous net uptake of mercury over the long term, on the contrary, the actual (gross) uptake is greater than what bulk analyzes of leaf samples (this study) can show.