

Interactive comment on “A numerical evaluation of global oceanic emissions of α -pinene and isoprene” by G. Luo and F. Yu

Anonymous Referee #1

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The authors apply bottom-up and top-down approaches for estimating the global oceanic emission of α -pinene and isoprene. Several investigators have done this previously for isoprene and the results from this study are similar what has been published. This first attempt to do this for α -pinene should be of interest to readers of ACP but there are several issues that should be addressed before this paper should be published:

1. The isoprene concentrations reported by Yassaa et al. are somewhat higher than the observed α -pinene concentrations. Since α -pinene has a longer lifetime than isoprene then this means that isoprene emissions must be higher than α -pinene emissions. So why is the top-down global α -pinene emission estimate (35.1 Tg) higher than isoprene (2.5 Tg)?
2. Is there any reason to assume that the marine species investigated by Yassaa are

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the source of the α -pinene observed? Are there other species of plankton that have not been surveyed? The authors should give some indication of what fraction of the total plankton biomass is represented by the species examined by Yassaa et al. If it is a small fraction of the total then it seems likely that the α -pinene emitting species has not yet been investigated. It could also be noted that Yassaa et al. found that ocimene was emitted from marine organisms at a higher rate than α -pinene. Since ocimene was not observed in the ambient air this seems to indicate a high diversity of emission patterns.

3. The authors should provide the details of the top-down and bottom-up approaches for one or more locations along the OOMPH tract (for example, Yassaa et al mentions a “far away”, “distant bloom” and “in-situ bloom” locations. This could be a table of emissions, compound lifetimes, boundary layer height etc. which would provide a clear comparison of the two approaches.

4. The global terrestrial emission of 127 Tg of α -pinene estimated (p 20728, line 13) is higher than other reported estimates. How was this estimated?

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