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Biogeosciences Discussions

Interactive comment on "Emissions of BVOC from Lodgepole Pine in response to Mountain Pine Beetle attack in high and low mortality forest stands" *by* T. R. Duhl et al.

Anonymous Referee #4

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This manuscript highlights very interesting questions about how Lodgepole Pine trees respond with their branch BVOC emissions to Mountain Pine Beetle (MPB) attacks. The measurements were made at two forest sites (Chimney Park - CP and Mountain Research Station – MRS) in early autumn, and in summer at the MRS. Besides investigating seasonal variability of the BVOC emissions and comparing the chemodiversity of the two sites, Duhl et al. discuss the emission of individuals at different infestation status (visually healthy, newly infested, earlier-infested and now recovering, and earlier infested and now declining). As some of the measured branches experienced some period of heat stress, the effect of this abiotic stressor is also investigated. Although the authors considered the work as a screening-study, the numerous questions

rised in the manuscript unfortunately seek for larger sampling number. Overall, the manuscript investigates a novel issue of infestation of forests, it is scientificly sound and the methodology session is well described and appropriote.

Some minor questions:

-The authors mention that lower, reachable branches were sampled from the trees, which may suggest generally shaded conditions of sampling. However, the presence of MBO points at de novo synthesis of BVOCs. What were the PAR values for the sampled branches, and would this variation explain the scattered appearence of some compounds (other than MBOs), or suggesting that part of the emission is synthetized besides it being released from storage pools?

-pg 9129/ 2. Methods and Table 1: How were BG and OB trees distinguished from healthy LG and CT trees? What visual signs used? Were the trees infested at the time of sampling? (BG, OB, BR or neighbouring trees)

-pg 9130/ line 22: Was there any effect of the baiting on tree emissions before the MPB attack? If this information can not be concluded from the current dataset, could the authors give a view on this based on previous observations maybe?

-pg 9146/ 1st paragraph: How did AB1 (long time heat stressed branch) change its emission during the stress period (August)? Was the emission observed in September (AB1) similar to that in August before overheating?

-Table 3: Due to the complexity of the current study, a remark of the experienced accidental influences of branches (heat stress, possible fungal infestation) could be marked besides the trees in Table 3. It would make the reader easier to have an overview why specific trees show unexpectedly high/low emissions.

-Table 5: Be more consistent with compounds names; assumed that "a-bergamotene“ means "cis“ isomer, as "a-trans-bergamotene“ is listed afterwards. Better to use the "E/Z“ isomer labeling instead of cis/trans; eg. c-beta-farnesene is Z-beta-farnesene.

BGD

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-pg 9137/ line 6: Specify what linear regression was applied for.

-pg 9140/ line 5: Table 3 instead of Table 2

Interactive comment on Biogeosciences Discuss., 9, 9125, 2012.