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Biogeosciences Discussions

Interactive comment on "Contribution of flowering trees to urban atmospheric biogenic volatile organic compound emissions" *by* R. Baghi et al.

Anonymous Referee #1

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This papers discusses observed BVOC emission rates for selected flowering trees. The authors conclude that emissions from tree flowers can contribute significantly to atmospheric BVOCs and may impact on air quality. With many aspects of the emissions of tree flowers currently unknown this is an original contribution which merits publication after the following aspects have been addressed.

Major points: The authors derive normalized emission rates for the main BVOCs observed for conditions of Ts = 30°C. As experiments were carried out in spring (the season for the discussed trees to bloom) the ambient and also enclosure temperature were below this reference temperature for crabapple (see figure 4 of the manuscript). For horse chestnut (figure 6) 30 °C were reached in the enclosure and the observed emission rates seem to level off at 28 °C. The authors do not provide the respective fig-

ures for honey locust and hawthorn (actually no figure at all is provided for hawthorn). This reviewer doubts that the normalization can be performed the way it was done by the authors and the approach needs to be further justified if followed in the final version of the paper. Many of the conclusions in this manuscript strongly depend on the choice of reference temperature for reporting normalized emission rates. For instance the comparison of modelled sum of monoterpenes from foliage emissions with floral emissions (figure 10) relies on correct emission rates as input for the model.

In their description of the sampling procedure the authors state that the sampling started no sooner than six hours after the enclosure was installed to allow stress-induced emission caused by closure installation to subside. It seems questionable that six hours are a scientifically justified upper limit for stress-induced emissions to occur. This is further supported by the authors reporting methyl salicylate as one of the major emissions of horse chestnut. Methyl salicylate is a well known stress-induced emission and it needs to be justified in detail why it is not considered to be indicative of stress in this case.

Minor and technical points (in order of appearance in manuscript):

Give references for your statements that VOCs play an important role in e.g. formation of tropospheric ozone and SOA.

Give references for statement that ∼90% of global terrestrial non-methane VOC emissions are biogenic.

What is the expected effect of the trees investigated being 3-5years old and potted?

Provide more details on the experimental procedure: for instance with the reported flow of 25l/min what is the residence time of air in the enclosure, respectively what is the associated exchange rate? Provide information on manufacturers of "respirator filter", "cartridge with MnO2-coated screens", "Velco strap".

What concentrations of reference gas were achieved in the samples and why was a

reference gas containing toluene chosen, when there is a chance that toluene is also emitted from the trees?

For the GC measurements: provide information on quality assurance such as limits of detection, accuracy etc.

With the lowest enclosure temperatures going down to below 5°C in the case of crabapple, the question arises, what was the lowest ambient and the lowest soil temperature during these measurements?

Figures: It is unclear why for selected trees time series are presented (fig 3 for crabapple and fig 8 for honey locust) while corresponding figures are not provided for the other trees investigated. Such figures could be added to the supplement. Furthermore all of these figures should include ambient temperature for comparison with enclosure temperature.

Similarly the plots of emission rate versus enclosure temperature are only provided for crabapple and horse chenstnut and corresponding figures should be provided for all trees investigated

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Interactive comment on Biogeosciences Discuss., 9, 3145, 2012.