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Interactive comment on "Sesquiterpene emissions from vegetation: a review" *by* T. R. Duhl et al.

Anonymous Referee #2

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The review paper on sesquiterpene emissions from vegetation tackles a most relevant topic for understanding the role of BVOCs in air chemistry and particle formation, where SQTs very likely provide a major but not yet quantifiable contribution. Recent studies like the one of Tunved et al. (2007) clearly establish that the forest is a major source of climate-relevant aerosol particles, but the contribution of highly reactive sesquiterpenes remains uncertain. As shown in the review paper, both quantities and controls of SQT emissions are largely unknown; a synthesis of the state of knowledge is urgently needed to push for more and better experiments.

The paper reviews the available knowledge on environmental controls over biogenic SQT emissions and provides a compilation of observed emission rates. It appears to be well done and complete, as expected by the Boulder research group who pioneered major parts of the BVOC and SQT research. The manuscript suits very well to the content of Biogeosciences, it should be published and may profit by the inclusion of a

few more recent references dealing with SQT emission rates and controls:

T.G. Kollner et al. (2004) The variability of sesquiterpenes emitted from two Zea mays cultivars is controlled by allelic variation of two terpene synthase genes encoding stereoselective multiple product enzymes. Plant Cell, 16, 1115–1131.

E. Ormeño et al. (2007) Monoterpene and sesquiterpene emissions of three Mediterranean species through calcareous and siliceous soils in natural conditions. Atmospheric Environment 41, 629-639

E. Ormeño et al. (2007) Water deficit stress induces different monoterpene and sesquiterpene emission changes in Mediterranean species. Relationship between terpene emissions and plant water potential. Chemosphere 67, 276-284

W. Vizuete et al. (2004) Sesquiterpene emissions and secondary organic aerosol fomation potentials for Southeast Texas. Aerosol Science and Tchnology 38, 171-181

P. Tunved et al. (2007) High Natural Aerosol Loading over Boreal Forests. Science 312: 261-263

T.M. Ruuskanen et al. (2007) Volatile organic compound emissions from Siberian larch. Atmospheric Environment 41: 5807-5812

V. Tarvainen et al. (2007) Towards a comprehensive emission inventory of terpenoids from boreal ecosystems. Tellus 598: 526-534

D. Tholl et al. (2005) Two sesquiterpene synthases are responsible for the complex mixture of sesquiterpenes emitted from Arabidopsis flowers. Plant J. 42, 757–771.

D. Tholl et al. (2006) Practical approaches to plant volatile analysis. The Plant Journal 45, 540–560

I. Merfort (2002) Review of the analytical techniques for sesquiterpenes and sesquiterpene lactones. J. Chromatogr. A, 967, 115–130

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N. Dudareva et al. (2005) The nonmevalonate pathway supports both monoterpene and sesquiterpene formation in snapdragon flowers. Proc. Natl Acad. Sci. USA, 102, 933–938.

Interactive comment on Biogeosciences Discuss., 4, 3987, 2007.