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Interactive comment on "Seasonal variability of monoterpene emission factors for a ponderosa pine plantation in California" *by* R. Holzinger et al.

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Holzinger et al. provide a very interesting data set on total monoterpenes emissions from a pine forest. As a biologist, several features of this paper are striking to me. First of all, Janson (1993) noted that delta-3-carene showed anomalous emission patterns in his study of monoterpene emission from Scots Pine. Similarly, Lerdau et al. (1994) found that this same compound showed emission patterns strikingly different from those of other monoterpenes in their study of emissions from Ponderosa Pine in Oregon. It may be that some aspect of monoterpenes metabolism unique to delta-3-carene at least partially underlies the lack of model fit seen in some of Holzinger et al.'s data. It would be interesting to see the fluxes of delta-3-carene from their trees.

Another point that may contribute to the interesting emission patterns observed by Holzinger et al. is the possible contribution of concentration-driven changes in vapor pressure to the observed emission rates. Lerdau et al. (1994 & 1995) were unable to reconstruct observed emissions of alpha- and beta-pinene from Ponderosa Pine and Douglas Fir without taking into account the effect of concentration on vapor pressure and emission. Monoterpene concentrations do show seasonal variations, and it would be interesting to see seasonal patterns of monoterpene concentrations from the trees in Holzinger et al.'s study. Perhaps seasonal changes in concentration led to changes in vapor pressure and emission that were independent of temperature.

In summary, this paper by Holzinger et al. is an important contribution to our understanding of monoterpene emissions from conifers, and the data suggest some interesting biological questions that should be taken up by plant ecologists. Examining the fluxes of individual terpene species and the seasonal patterns of terpene concentrations are important next steps.

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