Title:	Quantification of isoprene emission fluxes using a dynamic branch cuvette system from poplar (Populus deltoides) growing in North India
Authors:	Yadav, Priya (/jspui/browse?type=author&value=Yadav%2C+Priya)
Issue Date:	10-Oct-2019
Abstract:	Isoprene is the single largest contributor to the overall biogenic volatile organic compound (BVOC) emissions and can form secondary pollutants such as tropospheric ozone on reacting with anthropogenically emitted nitrogen oxides affecting the air quality and climate. Populus deltoides is an important commercial timber source and planted over an area of ~3120 km 2 as part of agroforestry practices in north India alone. Here, we present measurement results quantifying isoprene emission fluxes (EF iso) from Populus deltoides growing in their natural environment in north India during the monsoon and post-monsoon seasons using dynamic branch cuvettes coupled to real-time Proton Transfer Reaction- Mass Spectrometry (PTR- MS) and Thermal Desorption Gas Chromatography-Flame Ionization Detection (TD-GC- FID). There was excellent agreement between isoprene measurements obtained using the PTR-QMS and TD-GC-FID (r=0.98). We also measured water vapor and carbon dioxide using a Cavity Ring Down Spectrometer (CRDS) along with PAR and temperature for mechanistic insights regarding the emission process. The daytime measured isoprene emission flux (EF iso) ranged from 0.1-67.8 μg g −1 hr −1 and 0.2-18 μg g −1 hr −1 for the monsoon and post-monsoon seasons, respectively. Previous studies using other methods, have reported average (normalized to 1000 μmol m -2 s −1 and 30 °C) isoprene emissions ranging from 37 μg g −1 hr −1 by Evans et al. (1982) to 53.6 ± 11 μg g −1 hr −1 by Singh et al. We will discuss the relevance of our results in the context of EF iso calculated using the MEGAN BVOC emission model and regional air quality.
URI:	http://hdl.handle.net/123456789/1284 (http://hdl.handle.net/123456789/1284)
Appears in Collections:	MS-14 (/jspui/handle/123456789/1078)

Files in This Item:

File	Description	Size	Format	
MS14169.pdf (/jspui/bitstream/123456789/1284/3/MS14169.pdf)	Full Text.pdf	1.7 MB	Adobe PDF	View/Open (/jspui/bitstream/123456789/1284/3/

Show full item record (/jspui/handle/123456789/1284?mode=full)

(/jspui/handle/123456789/1284/statistics)