

2.095 Monoterpene chemical speciation at Amazonian Tall Tower Observatory (ATTO) tropical rainforest.

Early Career Scientist

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Abstract:

Little is known about biological and chemical processes happening within the tropical rainforest canopy. Especially, chemical speciation of monoterpenes in the Amazonian atmosphere is rare but important in order to understand the overall reactivity of the monoterpenes emitted from the forests as well as to understand why plants emit diverse mixtures of monoterpene species at different rates. The objective of this study was to analyse the chemical speciation of monoterpenes within the canopy at the tropical rainforest of the Amazonian Tall Tower Observatory (ATTO). The chemical identification was performed by Gas Chromatography Flame Ionization Detection (GC-FID). For sampling two autosamplers positioned at a tower at 12 and 24 m were used. Sampling of volatile organics occurred on cartridges filled with carbograph adsorbents. Samples were collected during October 2015, and were compared with previous studies at the site. Alternatively, vertical profile measurements (0.05, 0.5, 4, 12, 24, 38, 53 and 79 m) of total monoterpene measurements determined by Proton-Transfer Reaction Mass Spectrometry (PTR-MS). The results showed a distinct chemical speciation along the heights. For instance, *b*-pinene and *α*-terpinene are more abundantly found at 12m, suggesting differences in reactivity within the canopy. The most abundant monoterpenes at both heights are *α*-pinene, limonene and myrcene. We discuss if such differences are due to emission differences due to different plant species, a difference in leaf developmental stage, or other factors, such as phytopathogenic infections or ozone regimes that prove this difference in the speciation.