Evaluation of two statements methods by TD-GC-MS/TOF to BVOCs concentrations above the Amazon canopy

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Introduction: Many biogenic volatile organic compounds (BVOCs) are chiral, meaning they naturally occur as two mirror images of the same molecule. Past and current studies on chiral BVOCs have highlighted the existence of regiospecific patterns [1] and their variability with time of the day, season and height [2]. To better elucidate the role of the tropical forest as a source or a sink of chiral VOC was determined the concentration in two distinctive GC-MS/TOF methods in Amazon rainforest.

Methods: Air samples were collected in the Amazon Tall Tower Observatory (ATTO), located 150 km NE of Manaus, Brazil (02°08.752'S, 59°00.335'W) [3]. The site was chosen for having a tower enclosed into the canopy allowing it to measure above the canopy height. Samples were taken at 40m height during July/2019 and 2022 (wet season). The concentration of VOC in each sample was determined through GC-TOF-MS (Markes International, UK) at the Max Planck Institute for Chemistry and at University of California Irvine with the same type of detector. The GC-TOF-MS in Germany [4] is equipped with a thermal desorption unit, a chiral column and a TOF MS which operates in tandem mode and the TD-GC-MS/TOF in the USA is equipped with just one column [5].

Results: Data obtained from the chiral method shows that the concentration of enantiomeric compounds must be different than the simple column method used by the same analyser and mass detector.

Conclusions: The second column in addition to TD-GC-MS/TOF can allow the enantiomeric BVOCs identification related to the amount of concentration measured in the Amazon rainforest.

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