

Study characterizes the forest chemistry of the air in a Mediterranean forest

June 24 2020



Mediterranean holm oak forest located in the Montseny Natural Park. Credit: Universitat Autònoma de Barcelona

For the first time, a study has characterized the forest chemistry of the air under the canopy of a Mediterranean holm oak forest, and detected maximum chemical concentrations in July and August at early morning and early afternoon.

In the [forest](#), people experience a series of effects on their health. In general, these effects occur at the level of the cardiovascular, immune, respiratory and nervous systems, with accompanying changes to physiological and psychological well-being.

The increasing interest of the scientific community and society toward the potential of forests as a source of human well-being has led to many studies that provide evidence of the benefits for human health of exposure to forest ecosystems. Recent research points to the [volatile organic compounds](#) emitted by plants (monoterpenes) as the main determinants of the effects induced by forests.

Plants produce monoterpenes as a defensive mechanism against herbivory and to adapt to the environment. Among its most studied effects, the anti-inflammatory, neuroprotective and anti-tumorigenic activities stand out. Despite their relevant role in the forest-health binomial, these compounds have rarely been studied under the tree canopy level, which is where interaction with people occurs.

A study carried out by Albert Bach, researcher at the Institut de Ciència i Tecnologia Ambientals of the Universitat Autònoma de Barcelona (ICTA-UAB), together with researchers from the Forest Science and Technology Center of Catalonia (CTFC), CREAM, CSIC and the UAB Department of Geography, investigated the variability of these chemical compounds in a Mediterranean holm oak forest.

The results, published in the *International Journal of Environmental Research and Public Health*, demonstrate a strong variability of these compounds depending on the season and even day, with its highest concentrations during July and August at early morning (from 6 to 8 a.m.) and early afternoon (from 1 to 3 p.m.). The results also show that monoterpenes are strongly connected to temperature, [solar radiation](#) and relative air humidity. These peaks in concentration were not identified in

the rest of the sampled months, where emissions increased with solar radiation, reaching their peak around 2 p.m., coinciding with the daily temperature peak.

The results would thus imply that during the summer, humans walking in the forest would be subject to a potential higher absorption of monoterpenes into their bloodstream, especially in the early morning hours and early afternoon. The concentrations registered are similar or higher than in previous studies, showcasing the relationship between these [compounds](#) and human health, not only in the laboratory, but also in the forest.

This pioneering study opens a new framework for research into Mediterranean forests and constitutes an important contribution to the scientific and [public health](#) community.

More information: Albert Bach et al. Human Breathable Air in a Mediterranean Forest: Characterization of Monoterpene Concentrations under the Canopy, *International Journal of Environmental Research and Public Health* (2020). [DOI: 10.3390/ijerph17124391](https://doi.org/10.3390/ijerph17124391)

Provided by Autonomous University of Barcelona

Citation: Study characterizes the forest chemistry of the air in a Mediterranean forest (2020, June 24) retrieved 19 July 2024 from <https://phys.org/news/2020-06-characterizes-forest-chemistry-air-mediterranean.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.