

ANALYSIS OF CLAIRY'S PURIFICATION PROPERTIES¹

Executive Summary

The characterization of Clairry's purification system and its ability to improve IAQ interaction with biological system has been performed with the aim to answer to the following questions:

- 1) How the fan technical properties contribute to the depuration efficiency of Clairry?
- 2) What is the Clairry purifying activity towards known indoor air pollutants, and microbial load?
- 3) Can we estimate the depuration activity of Clairry in the long term?

Accordingly, starting from the end of 2017, a 18 months research activity has been performed by our team to explore the characteristic of Clairry system and its potentiality in the direction of IAQ improvement.

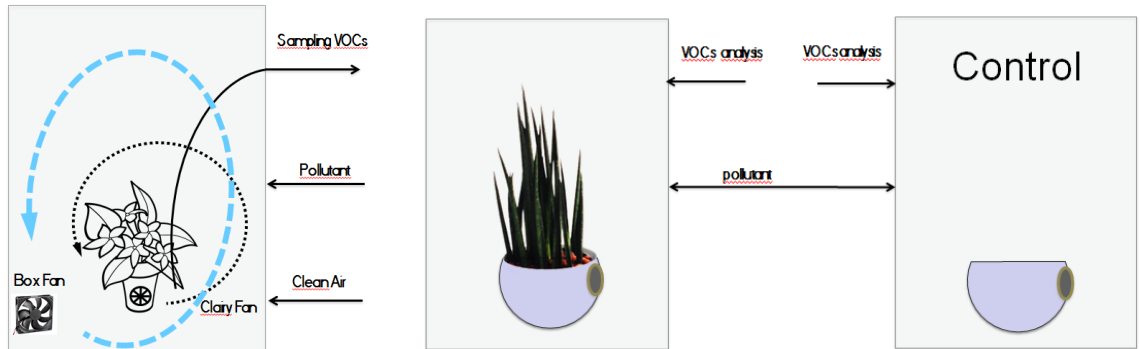
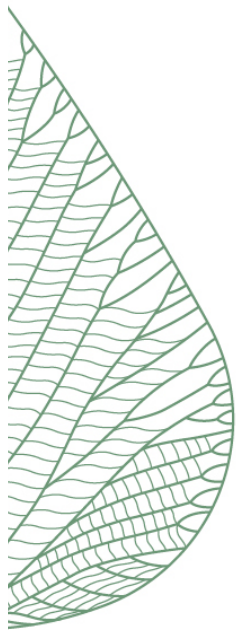
PNAT INSPIRED
BY PLANTS
ENVIRONMENT



The tests have been done using two common indoor plants: *Sansevieria trifasciata* and *Spathiphyllum*. Plexiglas boxes with a neoprene gasket (total volume of approximately 297 liter) equipped with a humidity/temperature sensor and an internal fan were used.

Working concurrently with 2 plant species (*Sansevieria trifasciata* and *Spathiphyllum*), 12 Clairry systems, 4 volatile organic compounds (VOCs) among the most common and/or dangerous indoor air pollutants (isopropyl alcohol, formaldehyde, benzene and limonene), more than 60 experiments plus replicates in *ad hoc* set-up have been performed with a PTR-ToF-MS (proton transfer - time of flight - mass spectrometer), an excellent tool for *in vivo* (no sample pre-treatment or extraction) and real time monitoring of volatile compounds emissions with extraordinary high spatio-temporal resolution. A zero-air generator, an instrument that purifies the atmospheric air to obtain less than 0.1 ppm of the total hydrocarbons, was used to clean the boxes before and after each experiment was performed. Clairry interaction with microbial load was also evaluated with bio essays.

¹ Please be advised that this is an Executive Summary of the analysis, for the full report please contact Clairry.



Schematic experimental set-up for the study of Clairiy effects on VOCs cinetic and depuration performances.

In this summary we will share the main conclusion that came out during the tests, such as:

- The internal fan of Clairiy increases the VOCs reduction activity in the short term and it is possible to see this effect in the first 20 minutes after turning on the Clairiy system.
- Clairiy was able to strongly reduce the isopropyl alcohol and formaldehyde concentration in the air within an hour and this capacity has been confirmed also in the 24h.
- The presence of a healthy plant always influenced positively the depuration activity of the Clairiy system.
- The Clairiy system also when subject to long term exposure of high concentration of formaldehyde demonstrated to be able to rapidly recover its ability to remove new pollutant.
- A bit of accumulation of the formaldehyde after one month exposure have been monitored but just one week in clean air was enough to bring back the release at the initial level.
- The Clairiy system did not shown to increase the level of microbiological diffusion in the air.

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