

The Fabbrica dell'Aria (Air Factory), an indoor air bio-filtration project

Plants can be valuable allies and provide possible solutions to air pollution, at least in indoors. Plants have an extraordinary ability to remove pollutants from the environment. They can, for example, depollute soil and water and are able to purify the air, removing all organic pollutants normally found indoors. With this in mind, [PNAT](#) (acronym for Project Nature) the spin-off company set up by the University of Florence, has created the [Fabbrica dell'Aria®](#) project, a system of botanical bio-filtration of air in indoor spaces, under the supervision of Stefano Mancuso, neurobiologist and botanist at the University.

The researchers, led by Stefano Mancuso, have patented the Fabbrica dell'Aria®, a special greenhouse that can be adapted to any environment, equipped with a special suction system combined with a mix of house plants that purify air naturally. The effectiveness of this system, capable of responding efficiently, sustainably and with very low maintenance costs to the need for air purification in indoor environments, has been tested by the [International Laboratory of Plant Neurobiology \(LINV\)](#) at the University of Florence.



La Fabbrica dell'Aria®. Credits: greenmedialab.com/lafabbricadellaria/

From the [Institute for the Environment \(Ispra\)](#) to [NASA](#) – which published a study on the ability of plants to eliminate pollutants in environments simulating spaceships – there are numerous studies that remind us that house plants can provide a natural purification service for indoor areas.

The research by PNAT's team has led to the development of a system able to remove pollutants of organic origin (VOCs, volatile organic compounds) with effective spin-offs and tangible applications. "A plant in a domestic environment, put in a pot, degrades pollutants but on a much smaller and slower scale. And it is almost irrelevant in the environment," says botanist Camilla Pandolfi. "Our air factory provides for a forced passage of air, which is sucked in from the environment and channelled through the root system of the plants. The roots, which live in association with bacterial flora, are already

able to capture polluting compounds such as formaldehyde and volatile compounds in general, and degrade them," she explains in detail.



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It took four years of research and experimentation to develop the project, years that were required to identify the most suitable substrate and plants. We use plants of tropical origin such as ficus, philodendrons (although the mix is very varied), classic house plants that survive well in our homes, accustomed to lower light conditions, not fond of cold and above all without periods of dormancy. One cubic metre of the Air Factory® greenhouse is able to naturally purify the air in a 100 square-metre flat. It is a special greenhouse with a strong visual impact but equipped with complex technology, able to reduce maintenance to a minimum, since all its features, from irrigation to control of the quality of the purified air, are practically automatic. The greenhouse is equipped with sensors that monitor incoming and outgoing pollutants; the data collected can be checked by smartphone at any time.

The first Fabbrica dell'Aria was installed in Milan, at the Green Media Lab and is now being installed in many social, professional and commercial areas.