

# PLANTS MEAN FRESHER AIR

Today's energy-efficient buildings have a downside, the re-cycled air not only seems less fresh than real fresh air, it really is stale by comparison. In many cases it is contaminated by gases and discharges from the many machines which often function 24hrs a day. Staff suffer from strange, hard-to-define ailments which are often lumped together and attributed to 'sick building syndrome.' But good news, scientists working for the American space programme have discovered that plants filter out contaminants; things like benzene, styrene etc. Tropical Ornamental's house magazine recently published an article on the subject and with Phil Cialone's agreement we reprint it here.

FOR MANY YEARS the process of photosynthesis has been well-documented. We know that plants live and grow through this process which requires a continuous exchange of gaseous substances between plant leaves and the surrounding atmosphere.

Quite simply, living green plants act as small 'clean air' machines. They normally take in carbon dioxide and give off water vapours and oxygen. In addition to the obvious aesthetic value of interior plants, there is a symbiotic relationship of people and plants. The flora replenishes the oxygen supply that we all need as people to survive.

This is a very important consideration for the interiorscaper, when dealing with the problems associated with the hermetically sealed homes and office buildings presently being developed and constructed.

During the past 25 years the nature of building materials and household furnishings has dramatically changed in an effort to save energy and construction costs. Pressed wood products and fibreboard have replaced natural wood in buildings. Household furnishings have changed, too. Pressed board, plastic and artificial

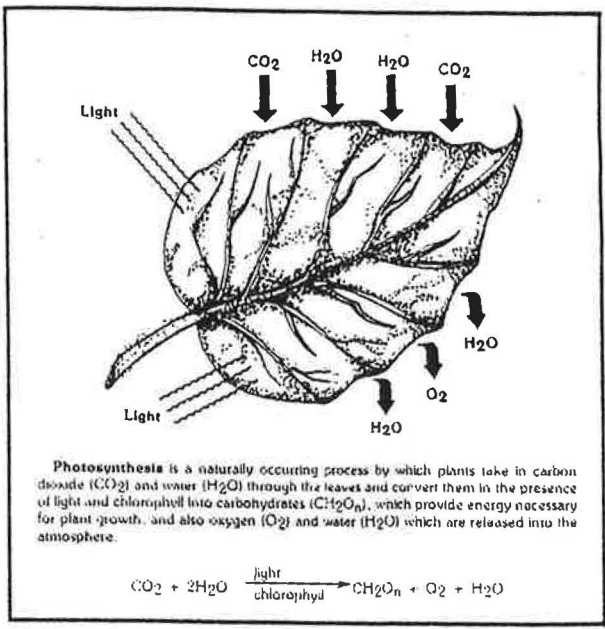
fibres are now commonplace.

Technology has brought increased use of various household products such as cleaners, insecticides, glues, hair sprays and other health care and grooming aids. These are convenient but add synthetic chemicals to the atmosphere inside homes.

The bottom lines in our interior household and workplace environments are filled with endless chemical compounds which emit trace levels of poisons into the air we breathe.

The energy crisis of the early and mid-1970s aggravated an already increasing indoor air pollution problem to our homes, offices, businesses and institutions. Super-insulation saves money on heating and cooling costs, but doesn't allow for proper ventilation of air exchange between interior and exterior environments.

Just look at today's high-rise office buildings. All windows are sealed. You can't let in the fresh outdoor air the air you breathe is re-cycled, and the trace organic chemicals emitted by construction materials, furniture, and cleaning fluids are also recycled and amplified with each pass through the controlled interior atmosphere.



Recent research commissioned by NASA demonstrates that common houseplants provide an enormous benefit in the production of 'clean air' in sealed interior environments. Not only does the houseplant take in carbon dioxide but it takes in other gaseous substances from the surrounding atmosphere to reduce the concentrations of indoor air pollutants such as formaldehyde and carbon monoxide.

Nature has provided the ultimate air purifier in the common houseplant, where technology has not.

In a study monitoring the indoor air quality at a home for the elderly in Washington, DC in March 1983, fifty-three different chemicals were found in the breathable environment. Many of them, including benzene, carbon tetrachloride, chloroform, methylene chloride, styrene, and tetrachloroethylene, were either mutagenic, carcinogenic or co-carcinogenic in character.

NASA, at the National Space Technology Laboratories in Mississippi has conducted research for many years using natural processes for waste recycling and air purification and revitalization for closed ecological life support systems.

Recently, this research has been directed toward the development of a biological air-purification system for closed environments such as energy-efficient homes using houseplants that produce abundant foliage.

A representative energy efficient home measuring 1800sq ft in area was found to sustain an average formaldehyde concentration of 240mg/m<sup>3</sup> with a 0.2 ach. Therefore an average 1800sq ft home with eight foot ceilings

would outgas approximately 482,000mg of formaldehyde daily. In addition, cooking with a gas stove would add an estimated 100,000mg to bring the total to 582,000mg of formaldehyde.

One common spider plant (*Chlorophytum Vittatum*) in a one gallon container can effectively remove between 31,220 to 62,440mg of formaldehyde per day. With the example just given a total of only eight to 15 spider plants would be needed to purify the air in the test house on a continuous basis.

Just one spider plant can go a long way in improving the air we breathe. With increased research on the interaction of different plants and their effect on removing harmful substances from our environments we will find another benefit of interiorscaping in our offices, lobbies, reception rooms, hotels, hospitals, restaurants and homes.

Other plants noted for their ability to purify the air are *Pothos*, *Syngonium*, *Aglanema* and *Spathiphyllum* species.

Psychologically, the aesthetics of interiorscapes are beneficial, but now there are important physiological reasons to bring nature's greenery indoors.

Technology is now working hand-in-hand with nature to allow architects and builders to design and construct facilities that will be super energy-efficient, yet will integrate a natural 'clean air' machine provided by the common houseplant for a more healthy interior living and breathing environment.

CREDITS: acknowledgements are due to the NASA HQ library for extracts from various papers published on the subject.

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