

Houseplants: Indoor Air Cleansers

By Susan Camp

Ideas for weekly columns appear in the most unexpected ways. Last week I attended a monthly luncheon meeting of a national organization of which I am a member. As I was leaving, another member, who is a Feng Shui practitioner, handed me a flier on using houseplants to remove air pollutants from indoor living areas. I had read a little about NASA research on the topic; in fact, the 2014 edition of "Home Gardening in Gloucester", written by Gloucester Master Gardeners, contains some information about the NASA study.

New construction techniques and products were developed in the late 1970's to maximize energy efficiency and reduce energy costs. Products included improved insulation materials and mechanical systems that reduced fresh air exchange. Employees who worked in buildings with the new systems soon began to complain of headaches, sinus and breathing problems, and other allergy-related symptoms. Synthetic materials used to manufacture flooring, carpeting, and office furnishings "off gas" chemicals that can contribute to health problems. This phenomenon became known as "sick building syndrome" and remains a problem in the United States and other developed countries.

Engineers and scientists at NASA, recognizing that astronauts would remain contained in closed environments for long periods during space travel, conducted a study to determine ways to improve indoor air quality using various houseplants. The study was a joint effort between NASA and the Associated Landscape Contractors of America (ALCA). Organic compounds tested in the study were benzene, trichloroethylene, and formaldehyde.

The solvent benzene is found in many common household products, including plastics, paints, and oils. Inhalation of high levels of benzene can affect the respiratory system and heart, damage the liver and kidneys, and may contribute to the development of leukemia, among other health problems.

Trichloroethylene (TCE) is used in the dry-cleaning industry, in the metal degreasing process, and is a component of many paints, inks, and varnishes. Exposure to TCE can cause liver cancer.

Formaldehyde has been in the news in the past 10 years, related to respiratory and allergic symptoms developed by Hurricane Katrina survivors living in travel trailers containing pressed woods, paints, and other products manufactured using formaldehyde. Formaldehyde can cause asthma attacks and is a suspected carcinogen.

In the study, twelve species of common houseplants were tested over a two year period to identify the capacity of each to remove pollutants from indoor air. This process is known as phytoremediation, and involves using indoor or outdoor plants to remove air, water, or soil pollutants by absorbing the harmful chemicals through their leaves and roots. The plants were

exposed to various levels of the three chemicals using several different methods with generally positive results.

More recent studies by other groups of researchers indicate that increased air circulation to the plants' roots increases air-cleaning capacity. One recent study included mercury vapor, which is contained in fluorescent light bulbs and is toxic to the nervous system. Results demonstrate that several different species of houseplant would be necessary to remove each chemical compound from a closed environment. Phytoremediation using houseplants is most effective in a non-ventilated, energy efficient building.

“Planting Healthier Indoor Air”, a 2011 article by Dr. Luz Claudio, associate professor at Mount Sinai School of Medicine, reviewed several studies and lists the ten houseplants that were found to be most effective at removing air pollutants from a closed environment. The list includes areca palm, lady palm, bamboo palm, rubber plant, dracaena ‘Janet Craig’, English ivy, dwarf date palm, Ficus macleilandii ‘Alii’, Boston fern, and peace lily. You can read the full article in the online journal “Environmental Health Perspectives” at <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3230460/>

Often we feel a disconnect between science and aesthetics, but using houseplants to improve the air quality in our homes, whether we call it “removing air pollutants” or “increasing energy flow” can contribute to a healthier lifestyle. Every new idea is old.

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