

Houseplants Help Clean the Air

By Barbara Lloyd

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NASA sees them as a valuable weapon in the fight against indoor air pollution

Common indoor plants may provide a valuable weapon in the fight against the rising levels of indoor air pollution. But not everyone knows about them.

Recently, a woman came into the Master Gardener Plant Clinic to ask about an insect attacking her spider plant. We recommended several treatments for the problem, but she decided that it would be too time consuming. When we added that it was a very good plant to have because it helped clean the air in her house, she reconsidered. And well she should.

“Plants are the lungs of the earth,” states B.C. Wolverton, PhD, in his book, *How to Grow Fresh Air*, “they produce the oxygen that makes life possible, add precious moisture and filter toxins.”

Cleaning indoor air has been a focus for numerous groups from federal and local governments to private companies to home owners. In a joint study by National Aeronautic and Space Administration (NASA) and the Associated Landscape Contractors of America (ALCA), scientists discovered that plants help reduce volatile organic chemicals/compounds (VOCs) in the sealed living compartments of space travel and proved to be an efficient way to filter the air.

This is excellent news for homeowners and office workers everywhere. Poor air quality can aggravate existing health issues and, in some cases, can even cause them. Plants in our homes or offices are not only decorative, but surprisingly useful in absorbing potentially harmful gases and cleaning the air inside modern buildings.

Newer homes and buildings, designed for energy efficiency, are often tightly sealed to avoid energy loss from heating and air conditioning systems. Moreover, synthetic building materials used in modern construction(as well as gas appliances, electronic devices, wood-burning stoves and tobacco smoke) have been found to produce pollutants that remain trapped in these unventilated buildings. Humans and their pets are also sources of air contaminants.

The list of harmful and hazardous substances can include formaldehyde, ammonia, benzene, carbon dioxide, carbon monoxide, methane, alcohol, acetone, phenols, ammonia, hydrogen sulphide and nitrogen oxide, to name just a few. They all contribute to indoor air pollution.

Formaldehyde is found in many building materials, including particleboard, foam insulation and cleaning products. Benzene is a common solvent found in oils and paints and waxes. The chemical trichloroethylene, or TCE, is used in paints, adhesives, inks and varnishes. Some of

these products release chemicals into the air during use, whereas others emit chemicals as they age, dry, or cure; a process known as out-gassing.



Left: A window of glass bricks is an ideal addition to a new bath, allowing for lots of light and increased privacy. Bricks can decrease the flow of fresh air into a humid environment, so the addition of moisture-loving tropical plants to the room will help to keep the air clean, fresh and healthy. **Top Right:** Public buildings and offices frequently add houseplants to lobbies and waiting rooms, usually plants such as dracaena, schefflera or philodendron that have simple water requirements. **Bottom Right:** The tropical Calathea or prayer plant has a wide variety of leaf textures and bold colors. The plant requires bright indirect light and a moist but not wet soil. *Photos by Christine Farrow / WSU Skagit County Master Gardeners*

Some plants in the NASA study proved to be better than others for absorbing these common pollutants, but all of the plants studied had properties that were useful in improving indoor air quality. Of those tested, not all have proven equally effective. For example, English ivy, gerbera daisies, pot mums, peace lily, bamboo palm and mother-in-law's tongue (or snake plant) were very effective in treating TCE. By contrast, bamboo palm, mother-in-law's tongue, red-edge dracaena, golden pothos and green spider plant worked well for filtering formaldehyde.

List of common houseplants studied by NASA are:

1. *Aglaonema modestum*, Chinese evergreen
2. *Chamaedorea seifrizii*, bamboo or reed palm
3. *Chlorophytum comosum*, spider plant
4. *Dracaena deremensis* 'Janet Craig'
5. *Dracaena deremensis* 'Warneckii', striped dracaena
6. *Dracaena fragrans* 'Massangeana', corn plant
7. *Dracaena marginata*, red edge dracaena
8. *Epipremnum aureum*, golden pothos

9. *Ficus benjamina*, weeping fig
10. *Hedra helix*, English ivy
11. *Philodendron domesticum*, elephant ear philodendron
12. *Philodendron scandens oxycardium*, heartleaf philodendron
13. *Philodendron selloum*, lacy tree philodendron
14. *Sansevieria trifasciata*, snake plant or mother-in-law's tongue
15. *Spathiphyllum* 'Mauna Loa', peace lily

Not all houseplants have been tested for their ability to clean indoor air. Nor can we assume that all harmful pollutants can be removed by houseplants. While houseplants are not a "total solution" to improving indoor air quality, they should not be overlooked as an aid in creating interior spaces conducive to the health of those who occupy them.



Right: Spathiphyllum or peace lily is not a lily at all but a species native to the tropics in Southeast Asia and the Americas. While excellent at removing contaminants from the air, it contains crystals that can be toxic to a dog or cat if ingested. *Photo by Christine Farrow / WSU Skagit County Master Gardeners*

(Note: Additional information provided by: Lin Hoisington)

Caution:

Some plants are toxic to pets, children. Before adding a new plant to a home with a pet or young child, check to find out if the plant has toxic properties and might be harmful.

- **Poison Center National Hotline:** 1-800-222-1222, free. They can tell you if a plant is poisonous and what symptoms might be expected. You need to give them the identity of the plant.
- **Animal Poison Control Center:** 1-888-426-4435. A \$65 consultation fee may be applied to your credit card.
- **ASPCA:** A comprehensive plant list is available for free from the ASPCA. Online: www.asPCA.org/pet-care/poison-control/

RESOURCES:

- http://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/19930073015_1993073015.pdf
- <http://www.ctahr.hawaii.edu/oc/freepubs/pdf/of-39.pdf>
- http://www.cleanair.org/program/indoor_air
- B.C. Wolverton, PhD., *How to Grow Fresh Air*, 1997.