A Breath of Fresh Air--Indoors!

Now's the time of year we can open our windows to air our houses but it's also a good time to take advantage of the houseplant sales around town. Many of our houseplants come from the tropical rainforest and can serve as valuable tools in eliminating indoor air pollution. Those plants in your office or home are not only decorative, but NASA scientists are finding them to be surprisingly useful in absorbing potentially harmful gases and cleaning air inside modern buildings. Please keep in-mind that many of these plants are considered toxic to babies and pets so please proceed with caution! If you have concerns the National Poison Control Center website is a very helpful resource and you can call for advise as well, 800-955-9119.

Bamboo palm (Chamaedorea sefritzii): Also known as the reed palm, this small palm thrives in shady indoor spaces and often produces flowers and small berries. It tops the list of plants best for filtering out both benzene and trichloroethylene. They're also a good choice for placing around furniture that could be off-gassing formaldehyde.

Chinese evergreen (Aglaonema Crispum 'Deborah'): This easy-to-care-for plant can help filter out a variety of air pollutants and begins to remove more toxins as time and exposure continues. Even with low light, it will produce blooms and red berries. Be careful with the berries!

English ivy (Hedera helix): If you have pets, especially ones that have accidents inside, you may want to add a pot of English ivy to your home. A recent study found that the plant reduces airborne fecal-matter particles. It has also been shown to filter out formaldehyde found in some household cleaning products.

Golden pothos (Scindapsus aures): This plant is mostly dark green, not golden. It is a powerful plant for tackling formaldehyde. It is a fast-growing vine that creates a cascade of green from a hanging basket. Consider locating it near a door closest to your garage since car exhaust is filled with formaldehyde.

Heart-leaf philodendron (Philodendron oxycardium): This climbing vine plant isn't a good option if you have kids or pets — it's highly toxic when eaten, but it's a workhorse for removing all kinds of VOCs (volatile organic compounds). Philodendrons are particularly good at battling formaldehyde from sources like particleboard.

Peace lily (Spathiphyllum 'Mauna Loa'): Shade and weekly watering are all the peace lily needs to survive and produce blooms. It topped NASA's list for removing all three of most common VOCs — formaldehyde, benzene and trichloroethylene. It can also combat toluene and xylene.

Red-edged dracaena (Dracaena marginata): This plant is best for removing xylene, trichloroethylene and formaldehyde, which can be introduced to indoor air through lacquers, varnishes and gasoline. Warneck dracaena (Dracaena deremensis 'Warneckii'): It combats pollutants associated with varnishes and oils with this dracaena. The Warneckii grows inside easily, even without direct sunlight.

Snake plant (Sansevieria trifasciata 'Laurentii'): Also known as mother-in-law's tongue, this plant is one of the best for filtering out formaldehyde, which is also common in cleaning products, toilet paper, tissues and personal care products. Put one in your bathroom — it will thrive with low light and steamy humid conditions while helping filter out air pollutants.

Spider plant (Chlorophytum comosum): Even if you tend to neglect houseplants, you'll have a hard time killing this resilient plant. With lots of rich foliage and tiny white flowers, the spider plant battles benzene, formaldehyde, carbon monoxide and xylene, a solvent used in the leather, rubber and printing industries.

Weeping fig (Ficus benjamina): A ficus in your living room can help filter out pollutants that typically accompany carpeting and furniture such as formaldehyde, benzene and trichloroethylene. Caring for a ficus can be tricky, but once you get the watering and light conditions right, they will last a long time.

All of these plants are in the tropical dome at the Mitchell Park Horticultural Conservatory. Oh, by the way, some of these plants are available in the Friends of the Domes gift shop, Gifts under Glass!

Paula Zamiatowski
Interpretive Educator

NASA Study House Plants Clean Air

Common indoor plants may provide a valuable weapon in the fight against rising levels of indoor air pollution. Those plants in your office or home are not only decorative, but NASA scientists are finding them to be surprisingly useful in absorbing potentially harmful gases and cleaning the air inside modern buildings. NASA and the Associated Landscape Contractors of America (ALCA) have announced the findings of a 2-year study that suggest a sophisticated pollution-absorbing device: the common indoor plant may provide a natural way of helping combat "SICK BUILDING SYNDROME". Research into the use of biological processes as a means of solving environmental problems, both on Earth and in space habitats, has been carried out for many years by Dr. Bill Wolverton, formerly a senior research scientist at NASA's John C. Stennis Space Center, Bay St. Louis, Miss. Based on preliminary evaluations of the use of common indoor plants for indoor air purification and revitalization, ALCA joined NASA to fund a study using about a dozen popular varieties of ornamental plants to determine their effectiveness in removing several key pollutants associated with indoor air pollution. NASA research on indoor plants has found that living plants are so efficient at absorbing contaminants in the air that some will be launched into space as part of the biological life support system aboard future orbiting space stations. While more research is needed, Wolverton says the study has shown that common indoor landscaping plants can remove certain pollutants from the indoor environment. "We feel that future results will provide an even stronger argument that common indoor landscaping plants can be a very effective part of a system used to provide pollution free homes and work places, " he concludes. Each plant type was placed in sealed, Plexiglas chambers in which chemicals were injected. Philodendron, spider plant and the golden pothos were labeled the most effective in removing formaldehyde molecules. Flowering plants such as gerbera daisy and chrysanthemums were rated superior in removing benzene from the chamber atmosphere. Other good performers are Dracaena Massangeana, Spathiphyllum, and Golden Pothos. "Plants take substances out of the air through the tiny openings in their leaves," Wolverton said. "But research in our laboratories has determined that plant leaves, roots and soil bacteria are all important in removing trace levels of toxic vapors". "Combining nature with technology can increase the effectiveness of plants in removing air pollutants," he said. "A living air cleaner is created by combining activated carbon and a fan with a potted plant. The roots of the plant grow right in the carbon and slowly degrade the chemicals absorbed there," Wolverton explains. NASA Study shows common plants help reduce indoor air pollution…. NASA research has consistently shown that living, green and flowering plants can remove several toxic chemicals from the air in building interiors. You can use plants in your home or office to improve the quality of the air to make it a more pleasant place to live and work – where people feel better, perform better, any enjoy life more.

TOP 10 plants most effective in removing: Formaldehyde, Benzene, and Carbon Monoxide from the air:

Bamboo Palm – Chamaedorea Seifritzii
Chinese Evergreen - Aglaonema Modestum
English Ivy Hedera Helix
Gerbera Daisy Gerbera Jamesonii
Janet Craig - Dracaena "Janet Craig"
Marginata - Dracaena Marginata
Mass cane/Corn Plant - Dracaena Massangeana

Mother-in-Law's Tongue Sansevieria Laurentii
Pot Mum – Chrysantheium morifolium
Peace Lily - Spathiphyllum
Warneckii - Dracaena "Warneckii"

Chemicals Used: Trichloroethylene (TCE) is a commercial product found in a wide variety of industrial uses. Over 90 percent of the TCE produced is used in the metal degreasing and dry cleaning industries. In addition, it is used in printing inks, paints, lacquers, varnishes, and adhesives. In 1975 the National Cancer Institute reported that an unusually high incidence of hepatocellular carcinomas was observed in mice given TCE by gastric intubation and now considers this chemical a potent liver carcinogen. Benzene is a very commonly used solvent and is also present in many common items including gasoline, inks, oils, paints, plastics, and rubber. In addition it is used in the manufacture of detergents, explosives, pharmaceuticals, and dyes. Benzene has long been known to irritate the skin and eyes. In addition, it has been shown to be mutagenic to bacterial cell culture and has shown embryotoxic activity and carcinogenicity in some tests. Evidence also exists that benzene may be a contributing factor in chromosomal aberrations and leukemia in humans. Repeated skin contact with benzene will cause drying, inflammation, blistering and dermatitis. Acute inhalation of high levels of benzene has been reported to cause dizziness, weakness, euphoria, headache, nausea, blurred vision, respiratory diseases, tremors, irregular heartbeat, liver and kidney damage, paralysis and unconsciousness. In anima tests inhalation of benzene led to cataract formation and diseases of the blood and lymphatic systems. Chronic exposure to even relatively low levels causes headaches, loss of appetite, drowsiness, nervousness, and psychological disturbances and diseases of the blood system, including anemia and bone marrow diseases. Formaldehyde is a ubiquitous chemical found in virtually all indoor environments. The major sources, which have been reported and publicized, include urea-formaldehyde foam insulation (UFFI) and particle board or pressed wood products used in manufacturing of the office furniture bought today. It is used in consumer paper products, which have been treated with UF resins, including grocery bags, waxed papers, facial tissues and paper towels. Many common household cleaning agents contain formaldehyde. UF resins are used as stiffeners, wrinkle resisters, water repellents, fire retardants and adhesive binders in floor coverings, carpet backings and permanent-press clothes. Other sources of formaldehyde include heating and cooking fuels like natural gas, kerosene, and cigarette smoke. Formaldehyde irritates the mucous membranes of the eyes, nose and throat. It is also a highly reactive chemical which combines with protein and can cause allergic contact dermatitis. The most widely reported symptoms from exposure to high levels of this chemical include irritation of the eyes and headaches. Until recently, the most serious of the diseases attributed to formaldehyde exposure was asthma. However, the Environmental Protection Agency (EPA) has recently conducted research, which has caused formaldehyde to be strongly suspected of causing a rare type of throat cancer in long-term occupants of mobile homes.

Poisonous Houseplants

Below is a list of poisonous houseplants. Not only are these houseplants poisonous to animals such as cats and dogs, but also humans, so please keep your young children away from them. Many are poisonous only if ingested. Please, if you are worried your child or pets has been poisoned due to a houseplant, contact your local poison center immediately.

Aloe Vera
Amaryllis
Angels Wings
Anthurium
Asparagus Ferns
Bird of Paradise
Chinese Evergreen
Corn Plant
Croton
Crown of Thorns
Devil's Ivy
Dieffenbachia (Dumb Cane)
Dracaena Palms
Amazon Alocasia, Elephant Ear
English Ivy
Fiddle Leaf Fig
Fishtail Palm
Gold Dust Dracaena
Heart leaf Philodendron
Janet Craig Dracaena
Peace Lily
Poinsettias
Pothos
Ribbon Plant
Rubber Plant
Sago Palm
Schefflera
Snake Plants - Mother-in Law's Tongue
Split Leaf Philodendron
ZZ Plants

Toxicity of Common Houseplants 031-91

African Violet—(Episcia reptans) non-toxic.
Aluminum Plant—(Pilea cadierei) non-toxic.
Amaryllis—contain alkaloid lycorine, bulb is most toxic; Crincum, Huemanthus, and Nerine genera of Amaryllis also contain
alkaloids in bulbs.
Aralia—(Fatsia japonica) non-toxic.
Arrowhead Plant, Nephthytis—(Syngonium podophyllum) toxic-oxalates.
Asparagus Fern—(Asparagus setaceus plumosus) toxic-dermatitis.
Avocado—(Persea americana) possibly toxic.
Azalea—(Rhododendron occidentale) toxic.
Baby Tears—(Helxine soleirolii) non-toxic.
Bear Feet—(Cotyledon tomentosa) succulent, non-toxic.
Begonia—(Begonia sp.) non-toxic.
Bird-of-Paradise—(Poinciana gilliesii) toxic.
Birdnest Sansevieria—(Sanseviera trifasciata) non-toxic.
Birds Nest Fern—(Asplenium nidus) non-toxic.
Bittersweet—(Solanum dulcamara) toxic-solanine
Bloodlead—(Iresine Herbstii) non-toxic.
Boston Fern—(Nephrolepis exalta) non-toxic.
Plants are third only to medicines and household chemicals in causing poisonings among children in the United States. It is wise to place all plants and plant materials out of reach of very young children (including seeds, plant bulbs, soil and fertilizers). lf you have a young child, buy only non-toxic plants.
The following is a list of the toxicity of common houseplants, including some common ornamentals growing around the home. Following this list is a description of the toxic compounds found in some plants.
POISON CONTROL CENTER
(Toll Free) 1-800-955-9119
Children's Memorial Hospital, Omaha
Boston Ivy—(Parthenocissus quinquefolia) toxic-oxalates.
Bridal Veil—(Tradescantia 'Bridal Veil') non-toxic.
Caladium—(Caladium sp.) toxic-oxalates.
Calathea—(Calathea argyraea) non-toxic.
Chenille Plant—(Acalypha hispida) causes skin and gastrointestinal inflammation.
Christmas Cactus—(Zygocactus truncatus) non-toxic.
Christmas Rose—(Helleborus niger L.) toxic-glycosides.
Chrysanthemum—(Chrysanthemum sp.) may give dermatitis.
Coleus—(Coleus sp.) non-toxic.
Corn Plant—(Dracaena fragrans massangeana) non-toxic.
Creeping Charlie, Ground Ivy—(Glechoma hederacea) toxic.
Creeping Charlie, Creeping Jenny, Moneywort—(Lysimachia nummularia) non-toxic.
Creeping Charlie—(Pilea nummularifolia) non-toxic.
Creeping Fig—(Ficus) possible dermatitis.
Croton—(Codiaeum variegatum) many species contain croton oil, a strong purgative which causes gastroenteritis.
Crown of Thorns—(Euphorbia milii) toxic.
Cyclamen—(Cyclamen persicum) a case of poisoning was reported in 1798.
Donkey Tail—(Sedum morganianum) non-toxic.
Dracaena indivisa—(Cordyline indivisa) non-toxic.

Dumbcane—(Dieffenbachia Seguine) toxic-oxalates
Emerald Duke—(Philodendron hastatum) toxic-oxalates.
Emerald Ripple—(Peperomia caperata) non-toxic.
English Ivy—(Hedera helix) toxic.
False Aralia—(Dizygotheca elegantissima) non-toxic.
Ferns—some wild species toxic, no reports of poisoning from houseplant species.
Fiddleleaf Fig—(Ficus lyrata) non-toxic.
Gardenia—(Gardenia radicans floraplena) non-toxic.
Gold Toothed Aloe—(Aloe nobilis) toxic - possible dermititis.
Grape Ivy—(Cissus rhombifolia) non-toxic.
Heartleaf Philodendron—(Philodendron cordatum) toxic-oxalates.
Hoya, Wax Plant—(Hoya sp.) non-toxic.
Hydrangea—(Hydrangea sp.) toxic - contains cyanogenetic glycoside.
Indian Laurel—(Ficus nitida) non-toxic, possible dermatitis.
Jade Plant—(Crassula argentes) non-toxic.
Janet Craig Dracaena—(Dracaena deremensis) non-toxic.
Jerusalem Cherry—(Solanum pseudocapsicum) toxic - contains solanine.
Kalanchoe—(Kalanchoe sp.) non-toxic.
Lantana—(Lantana camara) berries of some species toxic.
Lily-of-the-Valley—(Convallaria majalis) toxic-glycosides.
Lipstick Plant—(Aeschynanthus lobbianus) non-toxic.
Madagascar Dragon Tree—(Dracaena marginata) non-toxic
Madagascar Jasmine—(Stephanotis floribunda) non-toxic
Madagascar Lace Plant—(Aponageton fenestralis) non-toxic
Marble Queen—(Scindapsus aureus, Pothos aureus) toxic-oxalates.
Majesty—(Philodendron hastatum) toxic-oxalates.
Moon Magic—(Pilea 'Moon Magic') non-toxic.
Narcissus—(Narcissus sp.) toxic-alkaloid lycorin.
Needlepoint Ivy—(Hedera helix 'Needlepoint') toxic.
Norfolk Island Pine—(Araucaria excelsa) non-toxic.
Oleander—(Nerium Oleander, L.) toxic-glycosides.
Parlor Palm—(Chamaedorea elegans) non-toxic.
Painted Needle—(Coleus) non-toxic.
Peacock Plant—(Calathea) non-toxic.
Peperomia—(Peperomia sp.) non-toxic.
Piggyback Plant—(Tolmiea menziesii) non-toxic.
Poinsettia—(Euphorbia pulcherrima Willd) A child died in 1919 from eating poinsettia. Currently, feeding experiments
indicate that while poinsettia may cause a little irritation, the reports of serious poisonings are greatly exaggerated.
Ponytail Palm—(Beaucarenia recurvata) non-toxic.
Pothos, Devils Ivy—(Scindapsus aureus) toxic-oxalates.
Prayer Plant—(Maranta leuconeura) non-toxic.
Primula (Primrose)—some people are allergic to this genus. A rash similar to poison ivy may develop.
Purple Passion, Velvet Plant—(Gynura aurantiaca) non-toxic.
Purple Tiger—(Calathea) non-toxic.
Red Princess—(Philodendron hastatum) toxic-oxalates.
Rhubarb—(Rheum rhaponticum) leaves contain toxic oxalates.
Ripple Ivy—(Hedera helix 'Ripple) toxic.
Rubber Tree—(Ficus elastica) non-toxic.
Saddle Leaf—(Philodendron selloum) toxic-oxalates.
Sensitive Plant—(Mimosa pudica) possibly toxic.
Silver Tree—(Pilea 'Silver Tree') non-toxic.

Snake Plant, Mother-in-law Tongue—(Sansevieria trifasciata) non-toxic.
Spider Plant, Airplane Plant—(Chlorophytum comosum) non-toxic.
Split Leaf Philodendron—(Monstera deliciosa) toxic-oxalates.
Sprengeri Fern—(Asparagus densiflorous 'Sprengeri') possible dermatitis.
Swedish Ivy—(Plectranthus australis) non-toxic.
Tahitian Bridal Veil—(Gibasis geniculata) non-toxic.
Ti Plant—(Cordyline terminalis) non-toxic.
Umbrella Plant—(Schefflera actinophylla) non-toxic.
Umbrella Plant—(Cyperus alternifolius) toxic.
Wandering Jew—(Tradescantia albiflora) non-toxic.
Warneckii—(Dracaena deremensis 'Warneckii') non-toxic.
Weeping Fig—(Ficus benjamina) possible dermatitis.
Zebra Plant—(Aphelandra squarrosa) non-toxic.

Toxic Compounds

Alkaloid lycorine—irritant to the gastrointestinal tract.
Dermatitis—may give a rash or inflammation after contact with skin or mucous membranes.
Glycosides—cause cardiac stimulation, gastric distress, irritant to mouth and gastrointestinal tract.
Oxalates—plants which contain oxalate salts produce mucous membrane irritation and pain and/or swelling of mouth, lips, tongue, esophagus and stomach.
Solanine—irritation and injury of the digestive tract, abdominal cramps. vomiting. diarrhea, trembling, weakness, unconsciousness.
Toxic—if plants are listed as toxic, they may contain a wide variety of toxins. Damage may be to stomach, heart, kidneys, or other organs.
Non-Toxic—these plants have shown no more toxicity than an equal amount of vegetable matter. Symptoms are unlikely.