# Research shows some plants can remove indoor pollutants

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Hedera Helix

(PhysOrg.com) -- Some plants have the ability to drastically reduce levels of indoor pollutants, according to new research at the University of Georgia. Researchers showed that certain species can effectively remove air-borne contaminants, including harmful volatile organic compounds, suggesting a critical new role for plants in home and office environments.

Of the 28 plants tested, researchers identified five “super ornamentals”—those that had the highest rates of contaminant removal, a process called phytoremediation. These include the purple waffle plant (Hemigraphis alternataa), English ivy (Hedera Helix), variegated wax plant (Hoya cornosa), Asparagus fern (Asparagus densiflorus) and the

Purple heart plant (Tradescantia pallida). Placed in glass, gas-tight containers, the plants were exposed to a number of common household VOCs, including benzene, toluene, octane, alpha-pinene and TCE. The work, funded by UGA's Agricultural Experiment Stations, was published in the August 2009 issue of *HortScience*.

"The idea that plants take up volatile compounds isn't as much of a surprise as the poor air quality we measured inside some of the homes we tested," said Stanley Kays, UGA horticulture researcher and one of the study's authors. "We found unexpectedly high levels of benzenes and many other contaminants that can seriously compromise the health of those exposed."

Asparagus densiflora 'Sprengeri'

In fact, harmful indoor air pollutants can cause a host of serious illnesses, including asthma, cancer, reproductive and neurological disorders—and more than 1.6 million deaths a year, according to a 2002 World Health Organization report. The VOCs emanate from furnishings, carpets, plastics, cleaning products, building materials like drywall, paint, solvents and adhesives. Even tap water can be a source of VOCs. The air inside homes and offices is often a concentrated source of these pollutants, in some cases up to 100 times more polluted than outdoor air, according to research.

Why some plants are very effective at remediation—while others show little promise—is a mystery. “That’s one of the things we want to learn,” said Kays. “We also want to determine the species and number of plants needed in a house or office to neutralize the problem contaminants.”

Hemigraphis alternataa

Kays, D.S. Yang and S.V. Pennisi at UGA collaborate with researchers at Konkuk University in Seoul and at the National Horticultural Research Institute in Suwon, Korea, “where scientists are substantially ahead of us in phytoremediation research,” said Kays. “My colleague,

Kwang Jin Kim, has evaluated the ability of 86 species to remove formaldehyde in indoor environments."

Not all VOCs are toxic, and plants themselves emit some VOCs, though most appear not to be toxic, at least at normal exposure levels. But Kays said a lack of information about chemical toxicity—and an affordable method for measuring interior air quality—makes assessing their presence and safety more difficult. Fifty million organic and inorganic chemicals are now registered in the CAS system, a registry that includes chemical substances identified since 1957.

Kays said simply introducing common ornamentals into indoor spaces has the potential to significantly improve the quality of indoor air, but further research could help scientists refine the concept.

Provided by University of Georgia (news : web)

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