Houseplants cut indoor ozone

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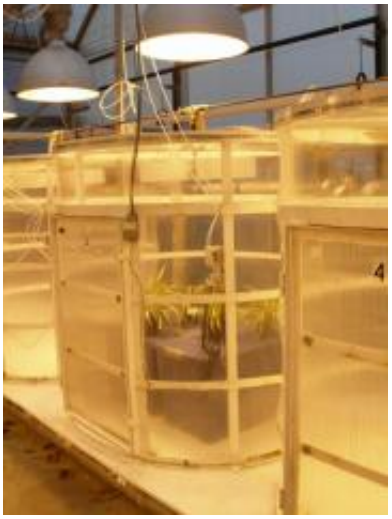

Experimental chambers in a Penn State University greenhouse were equipped with a charcoal filtration air supply system to measure ozone depletion rates. Credit: Photo by Dennis Decoteau

Ozone, the main component of air pollution, or smog, is a highly reactive, colorless gas formed when oxygen reacts with other chemicals. Although ozone pollution is most often associated with outdoor air, the gas also infiltrates indoor environments like homes and offices. Ozone can be released by ordinary copy machines, laser printers, ultraviolet lights, and some electrostatic air purification systems, all of which contribute to increased indoor ozone levels. Topping the extensive list of toxic effects of ozone on humans are pulmonary edema, hemorrhage, inflammation, and reduction of lung function.

Because people in industrialized countries spend as much of 80% to 90% of their time indoors, indoor air pollution has been ranked as one of the world's greatest public health risks. The United Nations Development Program estimated (1998) that more than two million people die each year due to the presence of toxic indoor air, while other studies estimate that 14 times as many deaths occur globally from poor indoor air quality compared with outdoor air pollution. The economic consequences of polluted indoor air can't be ignored either; one Australian study estimated that the cost of unhealthy indoor air in that country exceeds $12 billion annually, measured in losses of worker productivity, higher medical costs, and increased absenteeism.

As indoor air pollution poses new concerns worldwide, cost effective and easy-to-implement methods are needed to eliminate or reduce ozone concentrations. Activated charcoal filters reduce air pollutants, but installation and maintenance costs can be high. Now, researchers are investigating alternatives -- including the use of common houseplants -- to improve indoor air quality and health.

A research team from the Pennsylvania State University published the results of a new study of the effects of three common houseplants on indoor ozone levels in a recent issue of the American Society of Horticultural Science's journal HortTechnology. The scientists chose snake plant, spider plant, and golden pothos for the experiment because of the plants' popularity (primarily due to their low cost, low maintenance, and rich foliage) and their reported ability to reduce other indoor air pollutants. The plants were studied to determine their effectiveness in reducing ozone concentrations in a simulated indoor environment.

To simulate an indoor environment, the researchers set up chambers in a greenhouse equipped with a charcoal filtration air supply system in which ozone concentrations could be measured and regulated. Ozone

was then injected into the chambers, and the chambers were checked every 5 to 6 minutes. The data revealed that ozone depletion rates were higher in the chambers that contained plants than in the control chambers without plants, but there were no differences in effectiveness among the three plants.

"Because indoor air pollution extensively affects developing countries, using plants as a mitigation method could serve as a cost-effective tool in the developing world where expensive pollution mitigation technology may not be economically feasible", concluded the authors.

More information: The complete study and abstract are available on the ASHS HortTechnology electronic journal web site: horttech.ashspublications.org/ … nt/abstract/19/2/286

Source: American Society for Horticultural Science