

taken from HortIdeas, an excellent newsletter which excerpts the latest garden research <http://users.mikrotec.com/~gwill/hi-index.htm>

## Houseplants vs. Ozone

Indoor plants have been touted for several years for their potential to reduce the concentrations of various indoor air pollutants. Recent research conducted at Pennsylvania State University provides quantitative data for the first time on the efficacy of snake plants (***Sansevieria trifasciata***), spider plants (***Chlorophytum comosum***), and golden pothos (***Epipremnum aureum***) for lowering ozone concentrations in enclosed spaces. Ozone can be generated by copiers and laser printers, and its inhalation can lead to lung problems.

Penn State researchers used air-tight growing chambers, each having a volume of 70 cubic feet, in a greenhouse, adding one potted houseplant (with average leaf surface area ranging from about 1,200 to about 2,300 square inches) per chamber. The ambient ozone concentration in the greenhouse was less than 5 parts per million. After increasing the chamber ozone concentration to 200 parts per million, the (gradually diminishing) ozone concentration was measured every five to six minutes until the concentration reached the ambient level. The average time required for this was as follows: 50 minutes with a spider plant, 47 minutes with a golden pothos, 46 minutes with a snake plant, and 75 minutes with no plant (the control).

Clearly, all three of the plants tested can help to reduce concentrations of ozone in closed spaces. What isn't so clear is whether that ability translates into a significant positive effect on human health in real-world indoor environments. The researchers express enthusiasm about the relative low cost of using plants instead of filtration equipment to reduce indoor ozone levels, but more research is needed to determine whether the health benefits are great enough to install plants in particular situations.

(Also, there is the possibility of *negative* health effects due to chemicals produced by plants. See "Emission of Volatiles from Indoor Ornamental Plants," *HortIdeas*, May-June 2009, page 49.)

Reference: Heather J. Papinchak, E. Jay Holcomb (Dept. of Horticulture, Pennsylvania State University, University Park, PA 16802), Teodora Orendovici Best, and Dennis R. Decoteau, "Effectiveness of Houseplants in Reducing the Indoor Air Pollutant Ozone," *HortTechnology* 19(2), April-June 2009, 286-290. (American Society for Horticultural Science, 113 S. West St., Suite 200, Alexandria, VA 22314-2851.)

## Emission of Volatiles from Indoor Ornamental Plants

For many years, indoor ornamental plants have been promoted for, in addition to other desirable features, their ability to remove pollutants, such as formaldehyde and benzene, commonly found in homes and offices. However, the fact that plants also *emit* volatile compounds—some of which are known to affect human and animal health—into the air has received less attention.

Recent experiments conducted at the University of Georgia have revealed that the popular indoor plants ***Spathiphyllum wallisii*** (peace lily), ***Sansevieria trifasciata*** (mother-in-law's tongue), ***Ficus benjamina*** (weeping fig), and ***Chrysalidocarpus lutescens*** (butterfly palm) can emit a wide range of volatile organic chemicals (including terpenoids, alcohols, ketones, and esters). All four species emitted butyl butyrate, methyl salicylate, isopropyl myristate, and methyl salicylate.

The University of Georgia scientists who conducted the research also found that various volatile organic chemicals were emitted from the plants' growing media, plastic pots, and pesticides that (presumably) had been applied during commercial production. The release rates for the volatile compounds were fairly low, but the results raise concerns because some of the compounds are known to have *negative* effects on human health, and their "longevity and fate ... have not been adequately studied."

So the question now is: Are there *net* benefits of indoor ornamental plants that can both *get rid of* and *contribute to* indoor air pollution? Those who have publicized only one side of this story apparently were overeager! Stay tuned for more balanced coverage of the indoor plants-pollution connection.

Reference: Dong Sik Yang, Ki-Cheol Son, and Stanley J. Kays (Dept. of Horticulture, The Plant Center, 1111 Plant Sciences Bldg., University of Georgia, Athens, GA 30602-7273), "Volatile Organic Compounds Emanating from Indoor Ornamental Plants," *HortScience* 44(2), April 2009, 396-400. (American Society for Horticultural Science, 113 S. West St., Suite 200, Alexandria, VA 22314-2851.)