POTTED PLANTS REALLY DO CLEAN INDOOR AIR

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Why worry about urban air pollution?

Urban air pollution (mainly from fossil fuel combustion) is an international health problem. In Sydney alone, air pollution causes an estimated 2,400 deaths p.a.[1]. In addition, urban dwellers spend an amazing 90% of our time indoors, so that's where we meet all the air pollution[2,3] - and here air pollution is even higher than outdoors[3,4]. Why? Because the outdoor-derived load (of nitrogen, sulfur and carbon oxides, organics, particulates etc.) diffuses indoors and is augmented by indoor-derived contaminants. The main class of these is volatile organic compounds (VOCs), outgassing from other petroleum-based products, such as 'synthetics' in furnishings, detergents, paints, printers, 'air fresheners' and the like. The chemical mixtures, even at imperceptible levels, can cause 'building-related illness' and symptoms of headache, sore eyes, nose and throat, or nausea[5,6,7]. Dust, moulds and flueless gas appliance emissions can add to indoor pollution loads.

Indoor plants as air cleansers

International research, over more than two decades, shows that indoor potted-plants can significantly reduce all these types of air-borne pollutants, arising from either outdoor or indoor sources, and can also reduce noise levels[8,9,10,11]. Studies have also shown that, where indoor plants have been installed, staff wellbeing is improved with sick-leave absences reduced by over 60%, presumably as the result of both air-cleansing and aesthetic properties that promote staff wellbeing[12,13,14].

VOC removal from indoor air was first demonstrated in pilot screening studies by NASA, in a program to test the uses of plants in space missions[15,16,17]. Following this work, we have conducted detailed bench-top test-chamber investigations on VOC removal in nine species of internationally used potted plants, and shown that they can eliminate high doses of VOCs in about 24 hours, powered mainly by the root-zone microorganisms, that are nourished by the plants (a symbiotic microcosm)[18,19,20]. We also conducted a 'real-world' study using 60 UTS staff offices, with three planting regimes, which showed that, whenever total VOC loads rose above about 100 ppb (ie equivalent to about half an aspirin in an Olympic pool), even the smallest planting regime (6 shelf-sized plants), was enough to kick in and reduce concentrations by up to 75%, always to below 100 ppb once more. They were equally effective in air-conditioned or non air-conditioned offices. We are currently researching the *minimum* amount of plant material needed to be effective for air cleansing[21,22,23]. *No 'jungle' was used or necessary!*

Together, the numerous studies, from both our own research and a number of different sources around the world, show conclusively that the potted-plant microcosm can greatly improve indoor air quality by removing many major pollutants. It therefore represents an adaptive, self-regulating, portable, flexible, low-cost, sustainable and beautiful, air-cleansing system, that can be used in any building, and can complement any engineering measures, which are not normally aimed at lowering gaseous pollutants at all.

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