

INDOOR PLANTS FOR INDOOR POLLUTION : BOON OF MOTHER NATURE

Zoology

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ABSTRACT

Our environment has been deteriorated markedly in the last few years due to rapid increase in environmental pollution. Depletion of forests, population growth, vehicular emissions and various other undesirable human activities are mainly responsible for this degraded scenario of environmental health in India. Now it is essentially advisable to become protector, producer and caretaker of motherland and not the predator, polluter and consumer of earth. There is no need to dish out hundreds of dollars on expensive appliances when we have got Mother Nature. According to NASA there are plenty of plants that soak up harmful particles in the air and release fresh oxygen – all while adding a decorative touch. House plants are awesome indoor air cleaners, but some of them are more effective than others at filtering out pollutants and toxic chemicals in the air. Spider plant (*Chlorophytum comosum*), Boston fern (*Nephrolepis exaltata*), Areca palm (*Dypsis lutescens*) and Peace lily (*Spathiphyllum*), eliminate formaldehyde and xylene from the air around it. Golden pothos (*Epipremnum aureum*) also known as devil's ivy is also considered one of the most effective indoor air purifiers for removing common toxins. Bamboo palms (*Chamaedorea seifrizii*) also transpire a healthy dose of moisture into the air and is resistant to insect infestation. Snake plant (*Sansevieria trifasciata*) prevents formaldehyde that leaks from carpet and wood furniture from sticking around the air. It emits oxygen during the night making the rooms air fresh and clean. Aloe vera is also one of nature's miracle plants which also plays a very important role in cleaning air around it.

KEYWORDS

Pollution, Boston Fern, Areca Palm, Peace Lily, . Golden Pothos

Introduction:-

India is at the bottom of the charts when it comes to clean safe air. This creates a major health concern for the people living and breathing in the polluted air everyday. Not the outdoor air but even the indoor air is polluting day by day. It is estimated that 2.2 million deaths each year are due to indoor air pollution. The effects of indoor air pollutants range from short term effects – eye and throat irritation to long term effects respiratory disease and cancer. There is an easy and affordable way to combat indoor air pollution as acc. to NASA it is "Nature's life

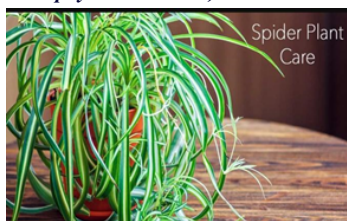
support system". Adding potted plants to a room has been shown to reduce the amount of air particulates.

Causes and effects of Indoor air pollution:-

The main cause of indoor air pollution in developing countries is traditional methods of cooking like use of wood, charcoal, coal, dung, crop waste, stoves etc. Such efficient cooking and heating practices produce different heating damaging pollutants such as fine particles and carbon monoxide.

Exposure to high levels of some indoor air pollutants can even result in serious diseases.

Pollutants		Sources	Effects	
1)	<u>Volatile organic compounds (VOC's)</u>	Fabrics, plastics, cigarette smoke, Gasoline, ink, oils, detergents, rubbers	Carcinogenic, also trigger the formation of photochemical oxidants such as peroxy acyl nitrates (PAN) and aldehydes which cause eye irritation, damage to liver, kidney and central nervous system, throat infection, headache, nausea, dyspnea, fatigue, dizziness, allergic skin reactions etc.	
A)	Benzene	Detergents, cleaners, cosmetics, plywood, foam insulation, carpets, furniture, paper goods, clothes, paints, wood floors, insecticidal spray		
B)	Formaldehyde			
C)	Trichloro ethylene	Drycleaning, inks, paints, varnishes, adhesives, lacquers.		
D)	Terpenes	Air freshners		
C)	Xylene	Paints, lacquers, adhesives, rust preventers, thinners, gasoline, permanent magic markers.		
D)	Toluene	Glues, inks, dyes, paints, cigarette smoke, gasoline.	Fibrotic lung disease (Asbestosis), changes in the lining of chest cavity (pleura)	
2)	<u>Asbestos</u>	Coating paints, building materials, ceiling and floor tiles.		
3)	<u>Radon</u>	It is a gas emitted naturally by the soil. Due to modern houses having poor ventilation. It is confined inside the house causing harm to the dwellers.		Radioactive, leading cause of lung cancer.
4)	<u>Smoke</u>	Tobacco		Lung cancer, emphysema, chronic bronchitis
5)	<u>Biological pollutants</u>	Pollen from plants, mites, hair from pets, fungi, parasites, bacteria	Asthma, hay fever, under developed immune system, coughing, watery eyes, sneezing, digestive problem, lethargy, dizziness, shortness of breath	
6)	<u>Carbon monoxide</u>	Cooking fuel as wood, coal, charcoal, dung, stove etc.	Highly toxic and fatal.	

1) Spider plant (*Chlorophytum comosum*)

Also known as air plane plant, spider ivy, ribbon plant, st. Bernard's lily etc. It is flowering perennial herb. NASA places this plant among the top 3 types of house plants that are great at removing formaldehyde. Also remove carbon monoxide and other toxins or impurities. With lots of rich foliage and tiny white flowers, the spider plant battles with formaldehyde and xylene and toluene, styrene, gasoline, solvent used in the leather, rubber and printing industries. Spider plants are one of the easiest houseplant to grow and they are almost impossible to kill.

2) Aloe vera

People have been using Aloe vera for more than 6000 years when it was known as "the plant of immortality" in early Egypt, according to the National Institutes of Health. This easy to grow sun loving succulent helps in clearing formaldehyde and benzene which are by products of chemical based cleaners, paints and more. It also converts carbon dioxide to oxygen during the night instead of day. So the best place to keep it in bedroom. Beyond its air cleaning abilities, the gel inside an Aloe plant has a lot of medicinal values.

3) Boston fern (*Nephrolepis exaltata*)

Also known as sword fern, fish bone fern, tuber ladder fern etc. It is the 9th top rated plant in NASA's list of 50 air purifying plants. It is found to be most efficient at removing formaldehyde, xylene and toluene. Boston fern also eliminates heavy metals such as mercury and arsenic from the soil. It is mostly grown in hanging baskets in homes.

4) Areca palm (*Dypsis lutescens*)

Also known as golden palm, yellow palm, butterfly palm etc. The Areca palm tree is the very best air purifying plant according to the rating from NASA's research and has the 8th highest removal rate for formaldehyde according to Dr Wolverton's data. This Palm should be kept in carpeted rooms or freshly painted furniture room as it reduces negative impact of xylene, toluene, formaldehyde and mostly all indoor air toxins.

5) Peace lily (*Spathiphyllum sp.*)

The peace lily does well in indirect light and requires minimal watering. It removes mainly all indoor pollutants like Benzene, formaldehyde, trichloroethylene, xylene, toluene and ammonia but it mostly removes Benzene and trichloroethylene. Peace lily absorbs the pollutants from the air through their leaves, then send to roots where these are broken down by microbes in the soil.

6) English ivy (*Hedera helix*)

It is evergreen climbing vine. It is recommended to grow it on buildings and homes as for its ability to cool the interior in summers. It also protects the buildings from fluctuation and direct exposure to heavy weather. It acts against benzene, formaldehyde, xylene, carbon monoxide and other air borne faecal matter particles to purify the indoor air. It also well works in freshly painted rooms, computers room and near printer or fax machines etc.

7) Snake plant (*Sansevieria trifasciata*)

Also known as mother-in-law's tongue. This plant uses crassulacean acid metabolism process which absorbs carbon dioxide and releases oxygen at night. It is one of the top air purifying plants identified by NASA. It removes carbon monoxide, benzene, toluene, xylene, formaldehyde, trichloroethylene etc. it should be potted in balcony near window or in bedrooms so it is also known as "the bedroom plant".

8) Golden pothos (*Epipremnum aureum*)



Also known as money plant, devil's ivy, hunter's robe, silver vine, taro vine etc. The money plant earns its common name from its traditional use as a wealth and prosperity booster in the Chinese system of feng shui, which is the ancient art of harmonizing indoor spaces. Epipremnum is a powerful air purifying plant that cleans the air most probably all VOCs. Epipremnum does best in indirect light.

9) Bamboo palm (*Chamaedorea seifrizii*)



It is also known as reed palm. It is the third most powerful plant at removing formaldehyde from air according to NASA. It also filters out xylene and toluene. This house plant will grow best in the moist but not wet soil and in direct sunlight. It is a good choice to keep this palm around furniture as filters out formaldehyde.

10) Chrysanthemum



This attractive house plant is effective in removing benzene (known to cause cancer). Many tobacco products contain high level of benzene so it would be helpful to have one of these plants in a smoking household. It also filters out formaldehyde.

Chart of air filtering plants

Plants	Benzene	Formaldehyde	Trichloroethylene	Xylene + toluene	Ammonia
Areca palm	X	√	X	√	x
Boston fern	X	√	X	√	x
English ivy	√	√	√	√	X
Spider plant	X	√	X	√	X
Money plant	√	√	X	√	X
Peace lily	√	√	√	√	√
Bamboo palm	X	√	X	√	X
Snake plant	√	√	√	√	X
Chrysanthemum	√	√	√	√	√
Aloe vera	√	√	X	X	X

The NASA clean air study has been led by the National Aeronautics and space Administration in association with the Associated Landscape contractors of America (ALCA). Its results suggest that

above mentioned indoor plants may provide a natural way of removing toxic agents such as benzene, formaldehyde, trichloroethylene from the air.

Conclusion

A NASA research documents came to the conclusion that "house plants can purify and rejuvenate air within our houses and workplace, safeguarding us all from any side effects connected with prevalent toxins such as formaldehyde, ammonia and also benzene. So it is very desirable to have potted indoor plants inside our buildings to filter out the polluted air. Indoor plants also reduce the stress of people and build healthy environment around us.

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