



## Ornamental plants: as natural air purifiers

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Indoor Air Pollution (IAP) is usually a greater direct threat to human health than outdoor air Pollution. IAP has been ranked as the fourth most crucial environmental problem prevailing today by the U.S. Environmental Protection Agency. The indoor environment is supposed to be the most important

determinant of overall human health as almost 75 per cent of the carcinogens come from indoors. The indoor air of houses have been reported to exhibit higher level of air pollution than surrounding outdoor air in cities and towns. Unfortunately, indoor pollution has not been given much importance though; most people spend as much as 80-90 per cent of their time indoors.

A pollutant released indoor is thousand times more likely to reach lungs than pollutant released outdoor. According to an estimate, in India 5,89,000 people die each year due to IAP; 4,96,000 in rural areas and

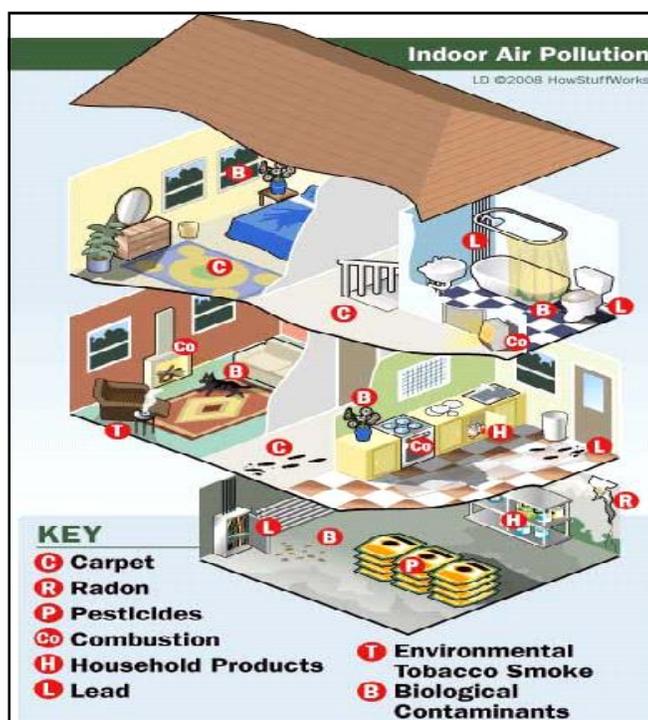
**Abstract :** The threat from outdoor air pollution is well known to all of us, but we are unaware of the threat from Indoor Air Pollution (IAP), which lead to various problems such as allergies, asthma, breathing difficulties, hair loss, dermatitis and skin rashes, dandruff problems (chronic) that don't go away despite use of anti dandruff shampoo, diarrhoea, itching of the nose, mouth, eyes, throat, skin or any area, sneezing fits (more than 3 sneezes in a row happening often). Indoor Air Pollution refers to the physical, chemical and biological characteristics of air in the indoor environment within a home, building, or an institution or commercial facility. In urban areas, exposure to indoor air pollution has increased due to a variety of reasons, including the construction of more tightly sealed buildings, reduced ventilation, the use of synthetic materials for building and furnishing and the use of chemical products, pesticides, and household care products. Daily averages of pollutant level emitted indoors often exceed current WHO guidelines and acceptable levels. There are various ways to combat indoor air pollution, such as by eliminating the source or have a source control, proper ventilation, use of air purifiers and house plants. But out of the various ways the use of indoor air plants is the cheapest and most reliable way to combat the IAP. These ornamental plants are the natural air purifiers. NASA has listed various plants such as Areca Palm, Lady Palm, Bamboo Palm, Rubber Plant, Dracaena, English Ivy, Dwarf Date Palm, Bostorn Fern, Peace lily that can successfully help to reduce the level of IAP. So plant these ornamental plants to purify your surroundings and breathe a fresh air.

93,000 in urban areas. Environmental Protection Agency indicated that indoor level of pollutants may be 2-5 times and occasionally more than 100 times higher than outdoor levels. These levels of indoor air pollutants may be of particular concern because most people spend

about 90 per cent of their time indoors.

Indoor air Pollutants are classified into 1) Chemical products of combustion such as  $\text{NO}_2$  and  $\text{CO}_2$ ) Formaldehyde, 3) Benzene, 4) Trichloroethylene.

Scientific studies, including a NASA survey, reveal that indoor air when contaminated by organic compounds is the primary cause behind most cases of nagging headaches, nausea, sore and itchy eyes, dry skin and loss of concentration. So if we thought that living in A.C house is very healthy than it is not so as we are



actually breathing the same air again and again. Every day house hold items such as cleaning liquids, air fresheners release pollutants more or less continuously and also construction materials, plastic paints, synthetic furnishings, computer accessories produce harmful substances that remain trapped inside the building and contribute to the build up of Sick building Syndrome. Some of the common health problems experienced due to these pollutants are allergies, asthma, breathing difficulties, hair loss, dermatitis and skin rashes, dandruff problems (chronic) that don't go away despite use of anti dandruff shampoo, diarrhoea, itching of the nose, mouth, eyes, throat, skin or any area, sneezing fits (more than 3 sneezes in a row happening often). 94 per cent of all respiratory ailments are caused by polluted air according to Indian Medical Association. The Environmental Protection Agency (EPA) warns people that 'Most people are aware that outdoor air pollution can damage their health but may not know that indoor air pollution can also have significant effects'. EPA studies of human exposure to air pollution indicate that indoor air levels of many pollutants may be 2-5 times and occasion more than 100 times, higher than outdoor levels.

Prevention is the best medicine when it comes to maintaining healthy indoor air quality. Keeping pollutants and contaminants out of your home before they start causing health problems for you and your family is much simpler and less costly than coping with illness after the fact. And maintaining healthier indoor air means you're also helping to keep our planet's atmosphere cleaner, too. There are many ways to combat Indoor Air Pollution, such as by eliminating the source or have a source control, proper ventilation, use of air purifiers and house plants. But out of the above means house plants are the best, as to have a source control over daily house hold items is quite tough. The cost of air purifiers is very high which is not in the reach of common man but on the other hand these plants are not so costly and are in the reach of every one.

There are a growing number of evidences indicating that indoor potted plants can make a significant contribution to the removal of air borne contaminants, including dust, inorganic gases and volatile organic compounds. Some of the indoor plants useful for removing these pollutants are Areca Palm, Lady Palm, Bamboo Palm, Rubber Plant, Dracaena, English Ivy, Dwarf Date Palm, Boston Fern, Peace lily and many other.

There are numerous benefits to using house plants to filter the air inside our home or office. Many people feel that if they are using an air purifier than the use of house plants is not needed. But research has shown that even if we use a HEPA air filter or an ionic Air purifier, there is a

lot of difference that can still be made by many common house plants, which act as living air purifier. The air purifying effect of the green house plants was studied extensively studied by the National Aeronautics and Space Administration. This was done by NASA when they were working to develop life support systems for space stations. Their research has shown that many common house plants can clean air from toxic gases, such as benzene, formaldehyde and many others. For example— Formaldehyde, which is emitted everywhere by particle board, plastic items, pressed wood furniture, carpeting and construction materials, can be reduced by ficus, aloe-vera, spider plant and philodendron. Dangerous and potentially life threatening volatile organic gases, can be absorbed by banana tree.

#### **List of some best indoor plants :**

*Pothos* : Also known as friendship plant or philodendron, can thrive anywhere without much effort. This climber with glossy green, heart shaped leaves can be grown in a pot as well as in a bottle and is a great humidifier.



*Wax plants* : Wax plants are an easy to care for dangler in the house. They do require direct sunlight, thus, ranking well in the category of being the best house plant for sunlight. South facing windows that receive sunlight in abundance could be a suitable place for the plant to thrive.



*Aloe* : It is a known fact that aloe is a plant packed with innumerable medicinal properties. It is used to produce hair products that are enriching and skin soothers that prove nutritious and revitalizing in their own respects. Aloe is one amongst the indoor house plants that demands lots of sunlight. Aloe rates high on the purification of the indoor air. It is the best house plant for cleaning air and filtering out toxins and pollutants present in the home environment. Aloe vera has juicy leaves and is also termed as a succulent house plant.



*Rubber plant* : This rough and tough plant can survive in extreme conditions. It's pretty effective at removing formaldehyde and other chemical toxins from air. It grows best when in semi sun and semi shade *i.e.* an ideal indoor plant.



*Lady palm* : A slow growing plant that is just perfect or

the indoors. It is also highly insect resistant and helps to improve indoor air quality. Other options in this category are Areca Palm and the Bamboo Palm.



**Mother-in-law's tongue :** Also known as Snake plant, and has straight and stiff green and white leaves with a somewhat marbled look. A very non-fuss plant and is a great air cleaner and emits oxygen even during night.



**Ferns :** They work great for removing pollutants like formaldehyde. They boost humidity levels and are best kept in semi-sunlit areas.



**Peace lily :** An outstanding foliage plant which produces lovely white spathes and is really good at removing alcohol, acetone, benzene and formaldehyde from the indoor air.



**Benefits of using house plants to filter air :** One of the major benefits of house plants is that they can work in virtually any space. House plants are particularly effective as a living air purifier in enclosed spaces, such as home and kitchens. House plants can also fit into spaces that many times will not accommodate an air purifier. Also house plants are a cost effective solution while air purifiers can be pricey especially for the consumer who may need



Areca palm

more than one.

One of the unintended benefits of house plants is that they can include a wide range of psychological and physiological effects. Plants can not only add beauty to a room, but also make it a friendly and inviting place to live or work. Plants may symbolize friendship and appear to have calming, spiritual effect on most people. The trend of using house plants for decoration and air purifying has moved into the corporate and retail world as well. Corporations have begun to install interior landscaping to increase worker productivity and decrease absenteeism. Elite hotels, restaurants and other businesses use plants to help entice customers into their establishments. We can all breathe easier realizing the many benefits of house plants.

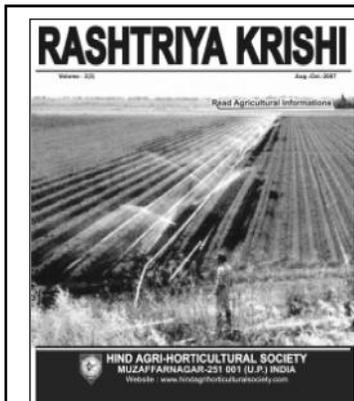
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