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Indoor Gardening: A Profound Insight in to A Healthier Life

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A balcony adorned with flower-filled plants is universally appealing. It is said that hope blossoms where flowers bloom. However, flowers offer more than just a vibrant addition to gardens and homes. They possess a profound power to illuminate dark days, elevate a heavy heart, bring solace in times of despair, or enhance the happiness of an already joyful life. Their vivid colours and classic charm can instantly enhance a verdant nook in a home. Beyond providing food and nutrition, the aesthetic contribution of plants is vital for our daily well-being and environmental health. The significance of plants extends beyond fulfilling our physical and economic necessities; they have a broad spectrum of positive impacts on humans, contributing to mental well-being, physical health, and community safety.

The prosperity of a nation is intertwined with the health of its citizens. A healthy development of the populace, particularly the youth, is essential, and this can be achieved by providing open spaces for breathing through bio-aesthetic planning and landscape gardening. Without this, a healthy society and a thriving nation cannot be expected. Indoor gardening, or interior-scaping, involves the design, arrangement, and maintenance of living plants in enclosed spaces. Its purpose is to create an aesthetically pleasing and harmonious interior. Given that people today spend most of their time indoors, it is crucial to ensure comfortable interiors with good air quality. This practice is employed in psychiatric hospitals, general hospitals, physical rehabilitation centres, senior homes, prisons, and schools. Plants are seen as a fundamental element of nature and are considered a representation of nature within manmade structures.

Plants are crucial for our survival and offer intangible benefits, such as health improvement. These advantages are present with both outdoor and indoor plants. For millennia, plants and gardening have been deemed beneficial for physical, mental, and social well-being. However, it was only recently that the subtle effects of plants on people were documented (Lohr, 2000). If mental health can be improved through plants, it would benefit both medical expenses and human resources. Moreover, plants contribute to public health and sustainable development by consuming minimal energy, mitigating global warming, and enhancing ecological diversity.

For thousands of years, people have been incorporating plants into their homes. As we spend more time indoors, the use of plants in these environments has also increased. Indoor plants offer numerous benefits: they purify the air we breathe, enhancing our well-being and comfort. They beautify our environment and help us feel more relaxed. Interior plants are linked to decreased stress and increased productivity.

With the rise of urbanization and industrialization, authorities are increasingly concerned with addressing both outdoor and indoor air pollution. While significant efforts have been made to control outdoor air pollution, indoor air pollution requires more attention as contaminant levels are often higher indoors. Public health is significantly impacted by indoor air pollution, especially since urban dwellers tend to spend more time inside than outside. Indoor plants and gardening offer a promising solution to reduce pollutant emissions and enhance the liveliness and aesthetics of indoor environments. It has been noted that gardening activities improve people's well-being, and plants are recognized for addressing both environmental and health issues.

Nowadays, with more construction and lifestyle changes, people spend 80-90% of their time indoors, where air pollution can be 3-5 times worse than outdoors, leading to various health problems in modern cities (Raymond *et al*., 2017).

Table 1: Some Major indoor pollutants

Carbon monoxide	Hydrocarbons
Benzene	Formaldehyde
Arsenic	Ozone
Nitrogen oxides	Trichloroethene
Sulphur Oxides	Particulate matter
Fluorine	Aldehydes

Various sources of indoor air pollutants include:

- Chemical spills and construction products like adhesives and paints
- Solvents used in adhesives
- Building materials
- Cleaning activities, tobacco smoke, and fumes from cooking oils and fuels
- Materials used in cooking, furnishing, and construction
- Cosmetics, costumes, and jewelry
- Design and construction defects such as poor foundations, roofs, facades, and openings for windows and doors, which can lead to pollutant or water intrusion
- Metals that have been processed or fabricated
- Furniture
- Heating and cooling systems with inadequate ventilation or poor maintenance
- House fires
- Incomplete combustion of fuels like gas, charcoal, and petroleum in burners
- Incomplete combustion of organic materials
- Air pollutants originating from nearby buildings, highways, or buses
- Painted surfaces
- Pesticides, household cleaning products, and consumer goods
- Plywood, particle board, foam insulation, carpeting, clothing, paper products, and household cleaners
- Office equipment like printers and photocopiers
- Synthetic fibres, inks, plastics, tobacco smoke, detergents, and oils.

Effects of indoor pollutants on human health

The urban lifestyle is associated with several adverse health effects due to environmental pollutants such as nitrogen and carbon dioxide, heavy metals, benzene, etc. These pollutants are linked to a range of health issues including stroke, cardiovascular problems, lung cancer, chronic and acute respiratory diseases, headaches, dizziness, reproductive and immune system disruption, and even premature death. Consequently, one of the most significant challenges of the 21st century is enhancing the health of the urban population (Marcel *et al.*, 2019).

- Allergies.
- Various lung and cardiovascular diseases.
- Symptoms like inflammation, skin drying and blistering, headaches, weakness, and blurred vision.
- Disruption of immune and reproductive systems, with potential impacts on liver, kidney, and fatal development during pregnancy.
- Impairment of blood's oxygen-carrying capacity, leading to headaches and fatigue.
- Increased personal discomfort.
- Issues such as nervous system failure.
- Pulmonary conditions, lung infection impairment, and increased susceptibility to infections, causing irritation of the eyes, nose, and throat (Susanto *et al.*, 2021).
- Respiratory diseases, unconsciousness, psychological disturbances, and paralysis.
- Symptoms like throat irritation, chest burning or discomfort, coughing, shortness of breath, and wheezing.

Benefits of Indoor Plants:

1. Improvement of Indoor Air Quality

Many common houseplants can eliminate a variety of indoor air pollutants, such as formaldehyde, carbon monoxide, ozone, toluene, and benzene (Papinchak *et al.*, 2009). They also offer additional benefits, including enhanced productivity, psychological relief, and reduced stress and negative emotions. It is known that humans inhale oxygen and exhale carbon dioxide, while plants do the opposite during photosynthesis. This complementary relationship between plants and humans leads to mutual benefits.

2. Happy Minds and Illness

The presence of live green plants and engaging in gardening can elevate one's mood (Thaneshwari *et al.*, 2018). Especially during dry months, the increase in humidity from plant transpiration can alleviate issues such as dry skin, colds, sore throats, and dry coughs.

3. Mental and Physical Healing

Plants may aid in reducing pain, anxiety, and fatigue. Individuals tend to recover from stress more rapidly when exposed to nature scenes through slides or videos compared to urban imagery.

Table 2: Some Best indoor plants that eradicate indoor air pollutants

Anthurium andreanum (Flamingo lily)	*Ficus elastica* (Rubber plant)
Sansevieria trifascata	*Spathiphyllum wallisii* (peace lily)
Dypis lutescens (Areca palm)	*Dieffenbachia spp.* (Dumb Canes)
Nephrolepis exalata (Boston fern)	*Gerbera jamesonii* (Barberton daisy)
Chlorophytum comosum (Spider plant)	*Hedera helix* (English ivy)
Philodendron cordatum (Heartleaf philodendron)	*Chrysanthemum morifolium* (Florist's chrysanthemum)

4. Sustainability through Nature

Urban environments often lack vegetation, leading to extreme temperatures. Indoor plants, when placed strategically, can reduce heating and cooling expenses and decrease electricity demand.

5. Reduction of Particulate Matter

Room plants can lower the deposition of particulate matter by up to 20%.

6. Indoor Conditions

The indoor environment of a building is primarily determined by two factors: indoor temperature and relative humidity. Indoor temperature is the result of radiation absorbed from the building's walls and roof. A building is considered thermally uncomfortable if the indoor temperature is excessively high or low.

Foliage plants have been shown to increase relative humidity to healthier, more comfortable levels. During summers, maintaining optimal humidity without air conditioning systems, which consume a lot of energy, is challenging. Therefore, using indoor plants can be an energy-efficient and cost-effective method.

7. Wellbeing and Feelings

The presence of plants in a room has been linked to positive emotions in humans. Many people report feeling more attentive and focused, and office workers express greater happiness when plants are around. A sense of being carefree, playful, and friendly is also enhanced by the presence of plants.

8. Stress Reduction

Small indoor plants may aid in alleviating stress-related conditions. Additionally, plants can boost productivity, as people often work better in their presence.

Interior-scaping with Plants:

Various types of house plants can be used indoors to improve air quality and are categorized into different groups.

1. Climbing and Trailing Foliage Plants

These plants require support to grow, and various supporting materials like split bamboo are utilized.

• Climbers: Ideal for hanging baskets, the attractive variegated climbers include *Ficus pumila*, *Ficus radicans variegata*, *Syngonium podophyllum*, *Asparagus plumosus*, *Hedera helix*, Philodendrons, etc.

• Trailers: This group's suitable species are *Zebrina pendula*, *Tradescantia fluminensis*, *Chlorophytum comosum* and others.

2. Bushy and Upright Foliage Plants

Plants in this category typically have attractive foliage and are well-suited for both arrangements and as individual specimens. Suitable plants include *Dieffenbachia exotica*, *Aspidistra lurida*, *Begonia rex*, *Philodendron bipinnatifidum*, Codiaeum (crotons), *Grevillea robusta*, Sansevieria and more.

3. Flowering House Plants

Typically, these plants boast attractive foliage and stunning flowers that persist throughout the year. Examples include:

• Climbing or trailing types: *Begonia spp.*, *Passiflora caerulea*, *Trachelospermum jasminoides*.

• Bushy and upright types: Saintpaulia, Aphelandra, etc.

4. Flowering Pot Plants

Plants that thrive in partial shade are well-suited for indoor pot cultivation. Suitable species for this category include Coleus, Begonias, Chrysanthemums, Pelargoniums (geranium), Azalea indica, etc.

5. Ferns and Palms

A variety of ferns and palms are appropriate for indoor gardening.

Recommended ferns: Pteris cretica, Nephrolepis exaltata, etc.

Recommended palms: Areca palm, etc.

6. Cacti and Succulents

Epiphytic cacti, which require minimal light, flourish under indoor conditions. Some suitable species are *Aloe variegata*, *Agave americana* '*Marginata*', Opuntia, Sedum spp.

Indoor air pollution is poised to become a significant issue for future generations. It is imperative to take action against it, as we are all aware of the various impacts of air pollution on the environment and human health. This issue will be more pronounced in densely populated countries like India, China, the USA, etc. Indoor air pollution demands more attention because urban dwellers spend most of their time indoors. Guidelines for the emission of specific pollutants should be established in offices, buildings, homes, and schools. Every individual needs to contribute to the fight against air pollution. To maintain a healthy and aesthetic lifestyle in urban areas, the practice of indoor gardening with ornamental and herbal plants should be promoted and implemented.

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