ANAT. Vol 1; Issue 3; JULY 2022

FACTA ANATOMICA

GREEN ZONE IN ANATOMY

INTRODUCTION

Indoor air pollution is fast becoming a grave environmental risk to public health. The term “buildingrelated illness” has been coined to describe afflictions such as bronchitis, asthma, etc. that can be traced to specific airborne contaminants in buildings. Besides, many other hazardous substances generate pollution indoors. Modern homes and office buildings commonly trap pollutants like benzene, formaldehyde, a ubiquitous chemical found virtually all indoor environments, trichloroethylene (TCE), etc.[1]

How plants clean air?

Most indoor plants have very high rates of photosynthesis which allow them to grow in very diffuse light, because generally they grow under the shade of the canopy of forests. This feature also allows them to grow indoors. The leaves, roots, soil and micro-organisms work together in a symbiotic relationship to remove pollutants. Air pollutants are removed from the air by being absorbed through tiny pores in their leaves. They are moved through the plant, to the root zone, where they are broken down by soil microbes. Some chemicals are broken down by the plant’s own biological processes. They purify and renew stale indoor air by filtering out toxins, pollutants and the carbon-di-oxide we exhale, replacing them with oxygen.[1]

Plant for our Planet

- The NASA Clean Air Study was a project led by the National Aeronautics and Space Administration (NASA) in association with the Associated Landscape Contractors of America (ALCA) in 1989, to research ways to clean the air in sealed environments such as space stations.[2] .

- The study of NASA found that there were specific plants that were most effective at removing benzene, formaldehyde, trichloroethylene, xylene, and ammonia from the air – harmful chemicals that have been linked to health effects like headaches, dizziness, nausea, and eye irritation.[2].

ANAT. Vol 1; Issue 3; JULY 2022

GREEN ZONE IN ANATOMY

Formaldehyde is widely used embalming agent in department of anatomy as well as it is ubiquitously found in the indoor environment which includes furniture , wooden products containing formaldehyde based resins such as particleboard, plywood, paints, wallpapers, glues, adhesives, varnishes, detergents, cosmetics, carpet cleaners, electronic equipments & other consumer items such as insecticides and paper products.

Side effects of Formaldehyde

- potential carcinogen-nasopharyngeal carcinoma
- myeloid leukaemia
- watery eyes
- burning sensations in the eyes nose, and throat
- coughing
- wheezing
- nausea
- skin irritation.

Relevance for health of indoor air exposure

The major exposure route of formaldehyde is inhalation from indoor sources. Formaldehyde is a normal component of blood. Exposure of humans to 2.5 mg/m3 formaldehyde did not increase the blood levels and exposure to 0.5 mg/m3 did not result in an increase in urinary formate excretion due to rapid metabolism. This suggests that formaldehyde levels normally encountered in indoor air, not exceeding 0.2 mg/m3 , are not expected to increase internal organ exposure.[3]

Department of Anatomy, AIIMS Rajkot has initiated a research project to measure and control the formaldehyde emissions in the indoor environment.

ANAT. Vol 1; Issue 3; JULY 2022

GREEN ZONE IN ANATOMY

LIST OF PLANTS STUDIED BY NASA

S. NO.	NAME OF PLANTS	VOLATILE ORGANIC POLLUTANTS REMOVED			
		Benzene	Formaldehyde	Trichloroethylene	Xylene & toluene
1	Boston fern (Nephrolepis exaltata 'Bostoniensis')	NO	YES	NO	YES
2	Areca palm (Dypsis lutescens	NO	YES	NO	NO
3	English ivy (Hedera helix)	YES	YES	YES	YES
4	Spider plant (Chlorophytum comosum	NO	YES	NO	YES
5	Peace lily (Spathiphyllum 'Mauna Loa')	YES	YES	YES	YES
6	Variegated snake plant, mother-in-law's tongue (Sansevieria trifasciata 'Laurentii') [4,5]	YES	YES	YES	YES
7	Chinese evergreen (Aglaonema modestum)	YES	YES	NO	NO
8	Florist's chrysanthemum (Chrysanthemum morifolium)	YES	YES	YES	YES
9	Rubber plant (Ficus elastica)	NO	YES	NO	NO
10	Aloe vera (Aloe vera)	YES	YES	NO	YES

ANAT. Vol 1; Issue 3; JULY 2022

GREEN ZONE IN ANATOMY

LIST OF PLANTS

1.BOSTON FERN

2. ARECA PALM

3. ENGLISH IVY

4. SPIDER PLANT

5. PEACE LILY

6. VARIEGATED SNAKE PLANT

ANAT. Vol 1; Issue 3; JULY 2022

GREEN ZONE IN ANATOMY

7.CHINESE EVERGREEN

8. FLORIST'S CHRYSANTHEMUM

9. RUBBER PLANT

10. ALOE VERA

CONCLUSION

- Regulatory agencies in many countries have established guideline values for concentrations of formaldehyde in indoor air. IARC (International Agency for Research on Cancer)has classified formaldehyde as a human carcinogen (Group 1) based on sufficient epidemiological evidence of nasopharyngeal cancer, and a recent IARC working group also found sufficient evidence for myeloid leukaemia.

- Developing Green zone in department of anatomy can help in reducing the toxic and carcinogenic effects of formaldehyde in the environment to certain extent.

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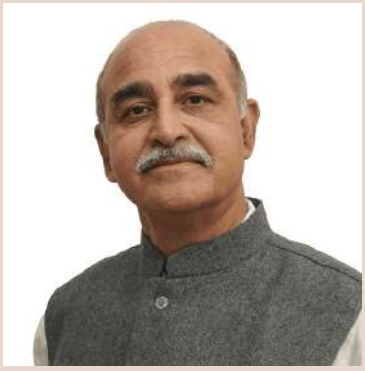

MESSAGE FROM EXECUTIVE DIRECTOR

PROF.DR. (COL.) CDS KATOCH, AIIMS RAJKOT

"I heartily congratulate the Department of Anatomy for bringing this informative newsletter on Green Zone in Anatomy. My best wishes to the entire team……..

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