

**Even low levels of air pollution linked with serious changes in the heart, according to new UK research****Science Daily, 03 August 2018**

The study, led by Professor Steffen Petersen, was part-funded by the British Heart Foundation (BHF) and published in the journal *Circulation*.

It looked at data from around 4,000 participants in the UK Biobank study, where volunteers provided a range of personal information, including their lifestyles, health record and details on where they have lived. Participants also had blood tests and health scans, and heart MRI (magnetic resonance imaging) was used to measure the size, weight and function of the participants' hearts at fixed times.

Pollution levels within UK guidelines

The team found a clear association between those who lived near loud, busy roads, and were exposed to nitrogen dioxide (NO₂) or PM_{2.5} – small particles of air pollution – and the development of larger right and left ventricles in the heart. The ventricles are important pumping chambers in the heart and, although these participants were healthy and had no symptoms, similar heart remodelling is seen in the early stages of heart failure.

Doctors and the general public all need to be aware'

Air pollution is now the largest environmental risk factor linked to deaths in England. The UK Government's consultation on their draft Clean Air Strategy closes on 14 August 2018, which commits to halving the number of people in the UK living in areas where PM_{2.5} levels exceed WHO guidelines (10µg per cubic metre) by 2025. Following this research, the BHF are calling for this action to go further to reduce the health impacts of toxic air as quickly as possible.

"Air pollution should be seen as a modifiable risk factor. Doctors and the general public all need to be aware of their exposure when they think about their heart health, just like they think about their blood pressure, their cholesterol and their weight."

Air pollution linked to changes in heart structure**The Guardian, 03 August 2018**

Air pollution is linked to changes in the structure of the heart of the sort seen in early stages of heart failure, say researchers.

The finding could help explain the increased number of deaths seen in areas with high levels of dirty air. For example, a report last year revealed that people in the UK are 64 times more likely to die from the effect of air pollution than people living in Sweden. Such premature deaths can be linked a number of causes including respiratory problems, stroke and coronary artery disease.

"What we don't know is what is the mechanism behind it, why is air pollution leading to increased risk of heart attack and stroke?" said Dr Nay Aung, a cardiologist at Queen Mary University of London and first author of the research.

The latest study helps to unpick the conundrum. Writing in the journal *Circulation*, Aung and colleagues report that they found exposure to nitrogen dioxide and fine particulate matter, known as PM_{2.5} and PM₁₀ particles, is linked to an increase in the size of two of the chambers of the heart, the left and right ventricle. PM particles are commonly emitted by motor vehicles, among other sources.

The authors add that similar changes can affect the performance of the heart and are often seen before heart failure takes hold.

The team used data from almost 4,000 volunteers who were part of a wider research effort known as the UK Biobank. These participants were aged between 40 and 69 years old, had been at the same address for the whole study, and were free from cardiovascular disease at the outset. Crucially, their data included cardiac MRI scans, which offer detailed images of the structure and function of the heart.

The study also involved estimates of the outdoor concentrations of different pollutants at participants' home addresses at about five years prior to the scan. After controlling for factors including age,



Well-cared-for indoor plants can do more than fill a space. Here's what to

The Fresno Bee, 01 August 2018

In the Central Valley we are forced by intense summer heat and unhealthy air quality to spend most of our summer days and nights inside, windows shut and air conditioning on full blast. We can find some relief from high temperatures indoors, but surprisingly we won't find relief from air pollution.

The air inside our homes and offices is can be more polluted than the outside air, perhaps two to five times more polluted according to federal estimates.

Major sources of indoor air pollution include VOCs or volatile organic compounds, building and paint products, carpets, cleaning supplies, plastics, formaldehyde, pet dander, dust and dust mites and fire retardant chemicals. Symptoms of indoor air pollution can resemble a slight cold or allergy and/or a fuzzy memory and difficulty in concentration which are alleviated by leaving the polluted environment. Long-term health conditions as a result of indoor air pollution have been studied and confirmed.

Houseplants have proven to be excellent filters for many common chemical pollutants. Some of those listed below are credited with absorbing up to 90 percent of benzenes, toluene, formaldehyde and acetone. Houseplants also release oxygen at night, increasing oxygen levels indoors when the windows are closed as they often are on hot summer nights.

Here's five commonly available houseplants which are most efficient as pollution filters. An online search for "houseplants- air pollution" will bring up more comprehensive lists. The excellent book "What Houseplant Where" from DK Publishing also provides good descriptions of beneficial houseplants.

GoodNews: Do you know you need only three plants to keep your home 'air' healthy?

Yahoo News, 08 August 2018

Fresh, oxygen-filled air is a thing of the past in most Indian cities. If you don't believe it, try looking out your window on the clearest night and count the number of stars in the sky. Not more than three or four, apart from the moon. The smog in the air has cocooned our cities and made us ill.

The capital New Delhi as well as Mumbai, Agra, Patna and Varanasi are some of the most polluted in the world. This air pollution is causing a myriad of respiratory disorders such as lung infections and asthma – and has increased the level of viral infections, migraine attacks, and persistent cough and cold.

At one point, Delhi-based Kamal Meattle, CEO of the Paharpur Business Centre (PBC), was in such bad shape, health-wise, he thought he would die. That's when he decided to do something about it. Now known as one of New Delhi's oldest green evangelists, Meattle has transformed his office building into a green paradise that 'washes' the pollution off the air and makes it healthy to breathe.

In fact, Meattle claims the air in his office is as crisp and fresh as the one you will find on the Swiss Alps.

In 2009, Meattle had given a TedTalk on the topic: How to Grow Your Own Fresh Air. This talk focussed on just three plants that you need in order to replace the polluted air in your home to fresh, clean, oxygenated air.

Not just Meattle, many international agencies have done similar studies to prove the advantage of having plants at home. According to a 1989 NASA study, these common houseplants, can remove even carcinogenic toxins and smoke from the air and clean it up for you. While the Indian market is slowly flooding with air purifying machines, we ask you, can a machine do what a natural plant can?

Tell us in the comments below. Also share your stories on how you the air in your home cleaner.



Contact lenses contribute to microplastic pollution

The Times of India, 20 August 2018

WASHINGTON: Discarded contact lenses are contributing to the rising microplastic pollution in the world's water bodies and could eventually find their way to the human food supply, scientists including one of Indian origin have found.

Lenses, usually discarded after about a month or sometimes just a day's use, often end up in wastewater treatment plants.

Researchers concluded that microbes in the wastewater treatment facility actually altered the surface of the contact lenses, weakening the bonds in the plastic polymers.

"When the plastic loses some of its structural strength, it will break down physically. This leads to smaller plastic particles which would ultimately lead to the formation of microplastics," said Varun Kelkar, one of the researchers from Arizona State University (ASU).

Aquatic organisms can mistake microplastics for food and since plastics are indigestible, this dramatically affects the marine animals' digestive system.

These animals are part of a long food chain. Some eventually find their way to the human food supply, which could lead to unwanted human exposures to plastic contaminants and pollutants that stick to the surfaces of the plastics.

"We began looking into the US market and conducted a survey of contact lens wearers. We found that 15 to 20 per cent of contact lens wearers are flushing the lenses down the sink or toilet," said Charlie Rolsky, a PhD student at ASU.

"This is a pretty large number, considering roughly 45 million people in the US alone wear contact lenses," said Rolsky.

Contacts tend to be denser than water, which means they sink, and this could ultimately pose a threat to aquatic life, especially bottom feeders that may ingest the contacts, researchers said.

Wastewater treatment plants – a surprising source of microplastic pollution

UN Environment, 22 August 2018

A lot of attention has been drawn recently to microplastics in freshwater and marine environments, and the threat they pose to ecosystems and people's health.

The source of microplastics is generally thought to be well known: most plastic items are not recycled or incinerated when they are discarded. Plastic waste therefore ends up in landfill or in our rivers and oceans where it gradually breaks down into smaller and smaller pieces and particles. Microplastics are defined as pieces of plastic 5mm in diameter or less.

A new study, however, concludes that treated sewage effluents are also key sources of microplastics – the implication being that wastewater treatment plants are not effective at filtering them out.

Published in July 2018, a study in the United Kingdom titled Wastewater treatment plants as a source of microplastics in river catchments looked at six river catchments in the north of England.

"The fact that the quantity of microplastics present in receiving waters was greater downstream of each of the six wastewater treatment plants studied confirms that treated sewage effluent is a key source of microplastics," concluded the authors.

The study also found microplastics upstream of water treatment plants. These, in turn, come from sewage sludge applied to agricultural land as fertilizer, the diffuse release of secondary microplastics, and aerial deposition.

One surprising finding was that while the composition of microplastics varied spatially and temporally, it was dominated by fibres, fragments, and flakes, as opposed to beads and pellets.

An additional reason for concern is that microplastics can also trap, or act as a vehicle for the dispersal of, harmful chemicals.



Most land-based ecosystems world-wide risk 'major transformation' due to climate change

Science Daily, 30 August 2018

The researchers used fossil records of global vegetation change that occurred during a period of post-glacial warming to project the magnitude of ecosystem transformations likely in the future under various greenhouse gas emissions scenarios.

They found that under a "business as usual" emissions scenario, in which little is done to rein in heat-trapping greenhouse-gas emissions, vegetation changes across the planet's wild landscapes will likely be more far-reaching and disruptive than earlier studies suggested.

The changes would threaten global biodiversity and derail vital services that nature provides to humanity, such as water security, carbon storage and recreation, according to study co-author Jonathan Overpeck, dean of the School for Environment and Sustainability at the University of Michigan.

"If we allow climate change to go unchecked, the vegetation of this planet is going to look completely different than it does today, and that means a huge risk to the diversity of the planet," said Overpeck, who conceived the idea for the study with corresponding author Stephen T. Jackson of the U. S. Geological Survey.

The findings are scheduled for publication in the Aug. 31 edition of the journal *Science*. Forty-two researchers from around the world contributed to the paper. The first author is geosciences graduate student Connor Nolan of the University of Arizona. Overpeck stressed that the team's results are not merely hypothetical. Some of the expected vegetational changes are already underway in places like the American West and Southwest, where forest dieback and massive wildfires are transforming landscapes.

"We're talking about global landscape change that is ubiquitous and dramatic," Overpeck said. "And we're already starting to see it in the United States, as well as around the globe."

Adapt, move or die: How biodiversity reacted to past climate change

Science Daily, 30 August 2018

Nature is reacting to climate change. We see altered behaviour and movement among plants and animals; flowers change flowering period and owls get darker body colour, due to warmer winters. So, how does the future for biodiversity look like? Will plants and animals be able to adjust quickly enough to survive the changing temperatures, precipitation and seasons? Lead-author of a new study Professor David Bravo-Nogues from Center for Macroecology, Evolution and Climate, University of Copenhagen, explains,

"We compiled an enormous amount of studies of events, which we know influenced biodiversity during the past million years. It turns out species have been able to survive new conditions in their habitat by changing either their behaviour or body shape. However, the current magnitude and unseen speed of change in nature may push species beyond their ability to adapt."

Until now, scientists thought species' main reaction to climatic changes was to move. However, the new study shows that local adaptation to new conditions seems to have played a key role in the way species survived. Species adapt when the whole population change, e.g. when all owls get darker body colour. This happens slowly over a long period of time. Coauthor Stephen Jackson, director of the US Geological Survey's Southwest Climate Adaptation Science Center, elaborates,

"From fossils and other biological "archives" we have access to a nearly limitless number of case studies throughout Earth's history. This provide us with valuable knowledge of how climate changes of various rates, magnitudes, and types can affect biodiversity."

The new study might give us the answer to decode how biodiversity changes under climate change. This knowledge can inform policy-makers in order to implement effective conservation schemes in the future.