



Keep Summer Alive with these 5 Winter-friendly Indoor Plants

The Bridge, 04 October 2018

As the leaves fall this autumn, so does serotonin and melatonin, disrupting our circadian rhythm and making it more difficult to sleep. This can lead to that glum feeling during the long winter months now diagnosed as Seasonal Affective Disorder—or SAD. It grows serious enough for six percent of Americans to be hospitalized with depression, according to psychologytoday.com. While plants can't bring back the sun, they nonetheless have the power to uplift, as demonstrated in a 2007 Norwegian survey of 385 office workers that indicated the presence of plants helped keep workers healthier and more productive. The Bridge spoke with local plant purveyors to find the best green friends to help you get through the darkest days.

The Christmas cactus, though it does not resemble a desert cactus, is actually a true tropical cactus. Christmas cacti look more like small green waterfalls of ridged leaves punctuated with tiny flowers blooming out of larger flowers in vibrant pink, red, and purple. Christmas cacti make popular seasonal gifts, and by removing y-shaped leaf segments, you can create new plants to give away for the holiday. Leslie Blouin of Agway in Montpelier had a few suggestions for caring for these succulents. She recommends bright, indirect lighting for Christmas cacti and reminds us to water them when the soil becomes dry.

The "lemon-lime" dracaena, has a palmesque look to it with its thin, long leaves marked by eye-catching stripes of dark green. It not only looks cheery, but has great "air-scrubbing" abilities. In a NASA study entitled "Interior Landscape Plants for Indoor Air Pollution Abatement," the space agency tested four varieties of dracaena and found the plants were effective in removing the toxic compound trichloroethylene from a sealed air chamber. When we are indoors the most, the Dracaena's filtering abilities will be the most valuable.

Gardening: Better breathing with houseplants

Maple Ridge News, 03 October 2018

We can all see the worldwide symptoms of stripping forests or using our oceans as a waste facility because we hear about it every day. Whether it's severe weather patterns or the decline of our few remaining killer whales, you can point the finger at the person in the mirror, and we are not averse to fouling our own nests.

Every single townhouse, apartment and home we live in is a potential hazardous waste site filled with harmful chemicals such as benzene, ammonia, xylene, formaldehyde and trichloroethylene.

And it might surprise you to know that you probably brought the benzene in with some paint stripper, adhesives, cleaning products or even tobacco smoke. The much scarier formaldehyde sneaks in unawares in cardboard, paints, smoke from wood burning stoves, floor finishes and pressed wood products, such as kitchen cabinets.

Think about the simple renovation of installing a new carpet with its fire retardants, adhesive, foam backing and stain protectors, all of which are derived from a cocktail of often toxic chemicals.

Sure, most of these will dissipate within 24-48 hours, provided there is good air circulation. But even health professionals are advising soon-to-be or new parents to put off nursery renovations in order to avoid potential respiratory problems in infants. Luckily the plant kingdom doesn't hold a grudge. Even though the human race has been busy cutting down rain forests, laying waste to natural prairie to make room for farms and killing the kelp with water-borne pollution, plants are still willing to come to our rescue and help negate many of the toxins in your home. In fact, NASA did a clean air study to see how effective common houseplants were at removing toxins by filtering the air and some of them were surprisingly good at it.



How climate change is making it harder to monitor marine pollution

Independent, 03 October 2018

Despite the dramatic news coverage of oil spills and other big pollution disasters in our seas and oceans, most environmental pollution is caused by much smaller incidents that are often invisible, persistent, and far more difficult to track.

While animals and plants caught up in these disasters are easily identified as stressed or physically affected by the pollution, with smaller incidents organisms might look and behave perfectly normal. Only over time does the chronic exposure to low-level pollution take its toll.

By the time this becomes obvious, often it is too late to do anything to save a particular population, whose decline might have knock-on effects on the surrounding environment, often with socio-economic consequences.

So there is not only a moral responsibility to look after the environment, but also a strong financial incentive, because many jobs and livelihoods depend on a healthy environment and its ecosystems.

Biomarkers of exposure provide a tool to identify pollution events early on, often at levels that are not detectable by conventional methods. Loosely defined as measurable effects (endpoints) in organisms, providing evidence of exposure to pollutants, biomarkers lead to establishing the cause and giving the necessary data to inform any policy decisions that need to be taken.

Such biomarkers exist in a number of biological areas. They can be purely biochemical, manifesting themselves as damages to DNA, alterations to the activity of enzymes involved in metabolism, structural damage to cells and their subsequent ability to perform properly, as well as more obvious pathological, reproductive or behavioural disorders. However, this requires intimate knowledge of the species and the relevant environmental variables, including how these may influence the respective biomarkers.

We have 12 years to limit climate change catastrophe, warns UN

The Guardian, 08 October 2018

The world's leading climate scientists have warned there is only a dozen years for global warming to be kept to a maximum of 1.5C, beyond which even half a degree will significantly worsen the risks of drought, floods, extreme heat and poverty for hundreds of millions of people.

The authors of the landmark report by the UN Intergovernmental Panel on Climate Change (IPCC) released on Monday say urgent and unprecedented changes are needed to reach the target, which they say is affordable and feasible although it lies at the most ambitious end of the Paris agreement pledge to keep temperatures between 1.5C and 2C.

The half-degree difference could also prevent corals from being completely eradicated and ease pressure on the Arctic, according to the 1.5C study, which was launched after approval at a final plenary of all 195 countries in Incheon in South Korea that saw delegates hugging one another, with some in tears.

"It's a line in the sand and what it says to our species is that this is the moment and we must act now," said Debra Roberts, a co-chair of the working group on impacts. "This is the largest clarion bell from the science community and I hope it mobilises people and dents the mood of complacency."

Policymakers commissioned the report at the Paris climate talks in 2016, but since then the gap between science and politics has widened. Donald Trump has promised to withdraw the US – the world's biggest source of historical emissions – from the accord. The first round of Brazil's presidential election on Sunday put Jair Bolsonaro into a strong position to carry out his threat to do the same and also open the Amazon rainforest to agribusiness. The world is currently 1C warmer than preindustrial levels.



Availability of nitrogen to plants is declining as climate warms

Science Daily, 22 October 2018

"Even if atmospheric carbon dioxide is stabilized at low enough levels to mitigate the most serious impacts of climate change, many terrestrial ecosystems will increasingly display signs of too little nitrogen as opposed to too much," said study co-author Andrew Elmore of the University of Maryland Center for Environmental Science. "Preventing these declines in nitrogen availability further emphasizes the need to reduce human-caused carbon dioxide emissions."

Although the focus on nitrogen availability is often on developed, coastal regions, such as the Chesapeake Bay, that struggle with eutrophication – runoff of nitrogen pollution from fertilized farms and lawns that feeds algae blooms and leads to the reduction in oxygen in the waters – the story is very different on less developed land, such as the mountains of western Maryland.

"This idea that the world is awash in nitrogen and that nitrogen pollution is causing all these environmental effects has been the focus of conversations in the scientific literature and popular press for decades," said Elmore. "What we're finding is that it has hidden this long-term trend in unamended systems that is caused by rising carbon dioxide and longer growing seasons."

Researchers studied a database of leaf chemistry of hundreds of species that had been collected from around the world from 1980-2017 and found a global trend in decreasing nitrogen availability. They found that most terrestrial ecosystems, such as forests and land that has not been treated with fertilizers, are becoming more oligotrophic, meaning too little nutrients are available.

"If nitrogen is less available it has the potential to decrease the productivity of the forest. We call that oligotrophication," said Elmore. "In the forested watershed, it's not a word used a lot for terrestrial systems, but it indicates the direction things are going."

How plants regulate their own nitrogen use

Earth, 24 October 2018

A new study has identified the pathways that a plant's genes use to direct to nitrogen to different parts based on need and the amount of nitrogen in the soil.

Nitrogen is a key part of the growth process for plants, and when the amount of nitrogen in the soil is limited, plants can direct nitrogen to its roots, flowers, and seed heads depending on who needs what.

Around 200 million tons of fertilizer is used every year by farmers to help increase yields, but nitrogen fertilizer can be extremely costly and poses a risk to the environment when fertilizer runoff leaches into waterways. The massive dead zone in the Gulf of Mexico, for example, is the direct result of nutrient pollution from fertilizer runoff into the Mississippi River watershed.

While researchers know that plants can actively direct nitrogen taken up from the soil, the specifics of the plant nitrogen network has remained a mystery until now.

Researchers from the Agricultural Research Service Plant, Soil, and Nutrition Research Laboratory recently identified the network of genes and gene regulators responsible for nitrogen allocation. The study, published in the journal *Nature*, could help with breeding new plant varieties that can more effectively use nitrogen which would reduce demand for nitrogen fertilizer for farmers.

For the study, the researchers used computational and molecular biological methods to identify 23 proteins called "transcription factors." These proteins have specific roles in sending nitrogen to different parts of the plant. Molecular biologist Doreen Ware, a member of the research team, then traced the proteins back the genes that control them and forward to the genes that they regulate.

**Air purifying plants****NATIONAL BOTANICAL RESEARCH INSTITUTE, LUCKNOW****Moss rapidly detects, tracks air pollutants in real time****Science Daily, 17 October 2018**

Moss, one of the world's oldest plants, is surprisingly in tune with the atmosphere around it. Now in a study appearing in ACS' journal Analytical Chemistry, scientists report that they have found a simple and inexpensive way to detect air pollutants, specifically sulfur dioxide, in real time based on subtle changes in moss leaves. The discovery could rapidly alert authorities to potentially dangerous alterations in air quality using a sustainable, natural plant sensor.

Plants have evolved the ability to sense light, touch, gravity and chemicals in the air and soil, allowing them to adapt and survive in changing environments. Thus, plants have been used in studies to assess the long-term damage caused by accumulated air pollution worldwide. However, this type of study requires skilled personnel and expensive instrumentation. Xingcai Qin, Nongjian Tao and colleagues wanted to develop an easier way to use moss, a particularly good indicator of sulfur dioxide pollution, as a rapid, real-time sensor.

The researchers gathered wild moss and exposed it to various concentrations of sulfur dioxide in a chamber. Using a highly sensitive, inexpensive webcam, the research team found that moss leaves exposed to sulfur dioxide slightly shrank or curled and changed color from green to yellow. Some of these changes, analyzed with an imaging algorithm, began within 10 seconds of exposure to the pollutant. However, once the sulfur dioxide was removed from the chamber, the moss leaves gradually recovered. This result suggests that the plant, unlike traditional colorimetric sensors, can regenerate its chemical sensing capacity. The researchers conclude that combining remote webcams or drones with moss or other plant-based sensors could lead to cheaper, faster and more precise monitoring of the air for sulfur dioxide and other pollutants over vast regions.

Go for these easy-to-grow indoor plants to fight the ill-effects of air pollution**The Indian Express, 29 October 2018**

Out of the 20 most polluted cities in the world, 14 are in India. With air quality level in the national capital dipping to 'very poor' a day after effigies were burnt on Dussehra, air pollution is a looming concern.

But there are some measures we can take on our part to combat the ill-effects of air pollution. For an easy and affordable way to fight indoor pollution, look no further than houseplants that purify the air. Potted plants help in reducing particulate matter.

However, it may come across as a challenging solution for people with a black thumb. But, fret not. We bring a list of houseplants that are easy to maintain and pretty difficult to kill.

This bright, flowering plant is effective at removing trichloroethylene and benzene, compounds that add to indoor air pollution. And it goes without saying, the pretty flowers will definitely add character to your decor.

They do not need direct sunlight and are relatively easy to grow, but they do need to stay moist. If you feel like keeping a fern, go with a Boston fern – it adds beauty to the house as well as cleanses the air. It is known to remove formaldehyde and xylene.

The deep green foliage of bamboo plants add a wonderful depth to a shade garden or warmth and colour to any room in the house. These palms thrive in full sun or bright light and are known to remove pollutants like benzene, formaldehyde and trichloroethylene.

Not only is it a plant that practically takes care of itself, but also has several benefits. The plant leaves contain a clear gel full of vitamins, enzymes, amino acids and other compounds that have wound-healing, antibacterial and anti-inflammatory properties. It also helps in healing skin conditions like psoriasis. Known to filter out formaldehyde, it is never a bad idea to grow it indoors.