

## Do air purifying plants really work?

There are many reasons to love houseplants - but to what extent can they improve your indoor air quality?

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Google 'houseplants for indoor air pollution' and you'll find many home décor websites, online shops and cute Pinterest and Instagram accounts touting the benefits of houseplants for purifying your air.

Air pollution inside can be three times worse than outside, according to a 2019 study commissioned for environment charity Global Action Plan.

So do houseplants offer a natural, cheap, easily accessible and attractive way to clean the air?

Read on to find out, plus discover other, simple ways to freshen up the air in your home.

One way to remove some of the polluting particles from the air in your home is to invest in an air purifier. Use our [air purifier reviews](#) to make sure you buy one that works well.

**Video: can plants clean the air in your home?**



## Stylish indoor plants



Houseplants are as popular as ever, particularly among urban millennials who don't have a garden.

African violet, aloe vera, Boston fern, English ivy, heart leaf philodendron, money plant, parlour palm, peace lily, snake plant (also known, rather unpleasantly, as mother-in-law's tongue) and succulents are among those frequently featured in articles rounding up the best air purifying plants for the home.

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These articles will often cite – usually rather loosely – a 1989 study by NASA of indoor plants in space-station environments. These were the first studies to highlight plants' capacity for air purification. Yet research in this field has now moved on.

## Do houseplants purify the air?

The truth is: in certain circumstances, to some degree.



### Can houseplants remove carbon dioxide and Volatile Organic Compounds?

We spoke to Dr Tijana Blanus, principal horticultural scientist at the Royal Horticultural Society (RHS).

Dr Blanus explained that research into the impact of houseplants on indoor air quality has intensified over the past few years – particularly the ability of plants to remove carbon dioxide (CO<sub>2</sub>) and other volatile organic compounds (VOCs), such as those emitted from paints and furnishings.

When CO<sub>2</sub> builds up, it results in drowsiness, dizziness and headaches, and creates an impression of a stuffy, closed house.

All leafy green plants will remove some CO<sub>2</sub> during the daytime, which they use for photosynthesis.

VOCs can cause eye, nose and throat irritation, nausea and loss of coordination. They can also exacerbate asthma symptoms, attack your nervous system and potentially lead to cancer.

The scale of the studies performed in recent years has ranged from testing individual plants in a room to testing rooms filled with plants.

Dr Blanus told us: 'So far, the results suggest that the impact of plants on levels of indoor CO<sub>2</sub> and other VOCs is relatively low, and either more light than you'll typically get at home or in an office, or much greater numbers of plants, would be required to make a significant difference'.

Many factors, including growing media (the potting soil that the plants are grown in), temperature and light intensity, all impact how quickly and efficiently plants can remove VOCs.

And air exchange – or air changes per hour, the number of times air is replaced in a room every hour – will be different in a real-life setting compared with a sealed lab chamber.

Nevertheless, it's an area of ongoing, and exciting, research.



### Can houseplants remove nitrogen dioxide?

Nitrogen dioxide (NO<sub>2</sub>) is formed when fuel isn't completely burned. It can come from heating appliances, fireplaces and stoves, and it can enter buildings from outside, from vehicle emissions.

Higher levels of NO<sub>2</sub> is associated with serious respiratory illness, reduced lung function and inflammation of the airways.

A March 2022 study by researchers at the University of Birmingham, in partnership with the RHS and published in the journal *Air Quality Atmosphere and Health*, found that certain houseplants could reduce the amount of NO<sub>2</sub> in a room to varying degrees.

Researchers tested three plants: a Peace lily (*Spathiphyllum wallisii*), Corn plant (*Dracaena fragrans*) and fern arum (*Zamioculcas zamiifolia*). Each plant was placed for an hour in a test chamber containing levels of NO<sub>2</sub> comparable to an office situated next to a busy road.

chamber containing levels of NO<sub>2</sub> comparable to an office situated next to a busy road.

All the plants, regardless of species, were able to remove around half the NO<sub>2</sub> in the chamber. And, whereas the way in which plants take up CO<sub>2</sub> very much depends on environmental factors, the plants' ability to absorb NO<sub>2</sub> wasn't dependent on the plants' environment, for example, whether it was kept in light or dark conditions, or whether the soil was wet or dry. Specific conditions, such as additional lighting, weren't required.

The team calculated what these results might mean for a small office (15m<sup>3</sup>) and a medium-sized office (100m<sup>3</sup>) with different levels of ventilation.

In a poorly ventilated small office with high levels of air pollution, the researchers calculated that five houseplants would reduce NO<sub>2</sub> levels by as much as 20 per cent.

In the larger space, the effect of five houseplants would be smaller – a 3.5 per cent reduction in NO<sub>2</sub> levels – but more plants would have a greater impact.

Over time, of course, NO<sub>2</sub> removal would decline, if the level of NO<sub>2</sub> in the air also decreased.

And, of course, these results aren't directly transferrable to your home, as they were carried out in a sealed chamber, whereas there would be some level of air exchange in your home.

## Should you buy a houseplant to boost your indoor air quality?



Every little helps when it comes to air quality. Houseplants can be one tool in your armoury when you're combating air pollution – and they generally make your home a more pleasant place to be.

You would need large numbers of plants to make a discernible difference to your indoor air quality (and they'd need to be the right plants, maintained under optimum conditions for CO<sub>2</sub> and VOC removal).

So, don't go buying plants for the sake of your air quality if you didn't otherwise want them and aren't going to bother making other lifestyle changes. If you love houseplants anyway, go right ahead.

Crucially, you should temper your expectations. Don't assume that you're breathing cleaner air just because you've got a few Instagrammable plants. It's important to take a holistic approach and think about all the ways you might be unwittingly generating air pollution, both indoors and outdoors.

## Houseplants for overall wellness



Air quality aside, houseplants can enhance our lives in a number of ways.

A study by the RHS and the University of Reading found that rounded, leafy houseplants give the biggest boost to wellbeing.

Participants scored plants on how beautiful, interesting, uplifting and relaxing they found them, with preferred plants found to give the greatest benefit to wellbeing.

Researchers used images of various species and styles of houseplants to show that people react positively to lush, green plants with a rounded, dense canopy – similar to that of many of the nation's favourite houseplants such as weeping fig (*Ficus benjamina*), Calathea and Swiss cheese plant (*Mosses deltoidea*).

plant (Monstera deliciosa).

Palms were found to have particularly positive associations, as they reminded people of holidays and happy memories.



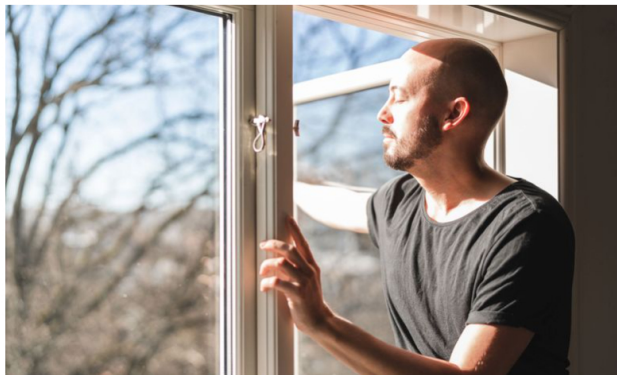
You also need to make sure you're looking after your plants properly. The researchers found that unhealthy plants reflected negatively on participants' perceptions of their indoor environment, and reduced feelings of wellbeing.

Dr Blanus, who was involved in this study says: 'Houseplants can play an important role in improving mental health and well-being in the indoor environment. Not everyone has a garden, but most of us can find space for a houseplant.'

'Choose plants that are easy to care for and maintain with the right support – such as self-watering containers for thirsty plants such as peace lilies (Spathiphyllum wallisii) – or choose less water-demanding plants such as Zamioculcas, to ensure they stay healthy and continue to provide benefits to your wellbeing.'

## Other ways to improve indoor air quality

### Open a window



If there's a bad smell in your house, open a window (and track down the source) rather than spraying air freshener.

But be strategic about when you do this, and avoid times when there's likely to be lots of traffic outside. [Research by the Building Engineering Services Association \(BESA\)](#) earlier this year highlighted the need to think carefully about when you open your windows: in some circumstances, it could have a negative impact on your air quality.

The Department for Environment, Food and Rural Affairs (DEFRA) has an [air pollution forecast map](#) which you can use to check pollution levels by postcode.

### Avoid scented products



The best way to avoid air pollution is to reduce any activities that generate it. Cut down on your use of scented products, such as perfumes, and easily-inhaled sprays.

## Prevent humidity building up



Open a window and switch on your cooker hood and extractor fans during and after cooking.

Do the same with your bathroom window and extractor fan after showering. Find out more about [avoiding mould in your bathroom](#).

Keep an eye out for signs of damp and buy a moisture absorber or dehumidifier if needed: use our [dehumidifier reviews](#) to find a good one.

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To find out more about indoor air pollution, from vacuuming to wood-burning stoves, head over to our guide to [improving your indoor air quality at home](#).

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## Air purifiers: can they help?



Another option is to buy an air purifier, although there are limits to what they can do.

Air purifiers can't clear the air of large, heavy allergens that have settled quickly on furniture and carpets. They can only remove allergens that are floating in the air.

Air purifiers that only have a mechanical filter can't capture odours or gases. Those that have an activated carbon filter are designed to do so.

Still, an air purifier can reduce the level of pollution in your home, as long as you buy a good one.

An air purifier may be particularly helpful if you suffer from hay fever and want to reduce your exposure to pollen, or you have a respiratory condition and find that high levels of pollutants triggers your symptoms.

For model suggestions and buying advice, read our guide on the [best air purifiers for 2023](#).

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