

《研究发现：气候变暖导致秋天树叶提前变色掉落》

秋天是一年中最美的季节，因为有绚丽多彩的树叶和金灿灿的落叶铺就的“地毯”。新研究指出，今后你看到这一秋日美景的时间要提前了，因为气候变暖将让秋天的树叶提早变色和掉落。





[illegible]

Climate-controlled experiments on five-year-old European beech and Japanese meadowsweet trees suggest what could be behind this unexpected result. In these trials, the trees were exposed to full sun, half shade or full shade. The results show that there is a limit to the amount of photosynthesis that a tree can carry out over a growing season. Think of it like filling a bucket with water. It can be done slowly or quickly, but once the bucket is full, there is nowhere for any more water to go.

[illegible]

This research shows that deciduous trees can only absorb a set amount of carbon each year and once that limit is reached, no more can be absorbed. At that point, leaves begin to change colour. This limit is set by the availability of nutrients, particularly nitrogen, and the physical structure of the plant itself. Nitrogen is a key nutrient which plants need in order to grow, and it's often the amount of available nitrogen that limits total growth. This is why farmers and gardeners use nitrogen fertilisers, to overcome this limitation.

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Together, these constraints mean that carbon uptake during the growing season is a self-regulating mechanism in trees and herbaceous plants. only so much carbon can be taken up.

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herbaceous [h??be??s]: adj. ???;???;???

In a world with increasing levels of carbon in the atmosphere, these new findings imply that warmer weather and longer growing seasons will not allow temperate deciduous trees to take up more carbon dioxide. The study's predictive model suggests that by 2100, when tree growing seasons are expected to be between 22 and 34 days longer, leaves will fall from trees between three and six days earlier than they do now.

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This has significant implications for climate change modelling. If we accept that the amount of carbon taken up by deciduous trees will remain the same each year regardless of the growing season, carbon dioxide levels will rise more quickly than was previously expected. The only way to change this will be to increase the capacity of trees to absorb carbon.

[illegible]

Plants that aren't limited by the amount of nitrogen available may be able to grow for longer in the warming climate. These are the trees which can take nitrogen from the air, such as alder. But these species will still lose their leaves at roughly the same time as always, thanks to less daylight and colder temperatures.

[illegible]

But on the upside, with the prospect of some trees losing their leaves earlier and others losing them at the time they do now, there might be the prospect of prolonged autumnal colours—and more time for us to kick through the

leaves.

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