

Researchers uncover the secrets of 'plant puberty'

August 22 2024



The study uncovered specific genetic changes that could control the timing of plant developmental transition. Credit: University of York

Researchers have identified the genetic changes linked to why plants go through a developmental change similar to "puberty" at different rates, a discovery that could lead to better crop nutrition.

This developmental change, called the vegetative-to-reproductive transition, happens over the course of a few days when plants slow down

their [leaf growth](#) and instead develop [reproductive organs](#). The findings are [published](#) in *The Plant Cell*.

Nutritious food

This dramatic physical change is very important to farmers and consumers, because it starts the process of nutrients in the leaves being diverted into the reproductive organs of the plant and eventually into their fruits and grains. Well-timed [plant development](#) means more nutritious food.

Farmers have tried to breed crops to be as uniform as possible, but despite their efforts, just like in humans, puberty happens at different ages in different individual plants.

To investigate the factors that influence the timing of this transition, researchers from the University of York grew *Arabidopsis thaliana*—a kind of wild mustard most similar to Brassica crops like cabbage and broccoli—in conditions where the soil, temperature, humidity and light were as consistent as possible.

Researchers chose this species because it has been inbred over generations to create a nearly genetically identical pool of seeds.

Controlled conditions

Even in these highly controlled conditions, the plants started showing signs of the developmental transition on different days. When around half the plants had undergone the transition, the scientists measured the genetic activity of all the plants.

While the plants had the same chronological age, they were on different

points along the path of plant "puberty." The researchers identified specific [genetic changes](#) that correlated with the timing of this developmental change.

They also discovered that plants start the process of killing their leaves even before the scientists saw visible reproductive structures.

Genetic changes

Lead author of the study, Dr. Daphne Ezer from the Department of Biology, said, "In some ways, plant and human growth is very similar: everyone experiences it in their own unique way.

"Our study uncovered specific genetic changes that could control the timing of plant developmental transition, paving the way for future improvements in crop uniformity and quality."

"Remarkably, we also found that plants are starting to redirect nutrients from their leaves to their flowering structures even earlier than we anticipated. To supercharge the nutritional value of crops, farmers might need to pay attention to these hidden processes happening well before any visible signs of the vegetative-to-reproductive transition."

More information: Ethan J Redmond et al, Single-plant-omics reveals the cascade of transcriptional changes during the vegetative-to-reproductive transition, *The Plant Cell* (2024). [DOI: 10.1093/plcell/koae226](#)

Provided by University of York

Citation: Researchers uncover the secrets of 'plant puberty' (2024, August 22) retrieved 22 August 2024 from <https://phys.org/news/2024-08-uncover-secrets-puberty.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.