

Longevity gene discovered in plants

April 14 2020



Credit: CC0 Public Domain

Harvesting rice from the same field, without planting new rice plants? A discovery may bring this scenario closer. Leiden scientists have discovered a gene that allows annual plants to grow after flowering, instead of dying. Publication on 13 April in *Nature Plants*.

Plants have growing points on their stems. These are groups of stem cells that can form new stems with leaves or flowers. In [perennial plants](#), a number of those growing points remain vegetative, so that after flowering the plant can continue to grow in the next season. In annual plants, this does not happen and the plant dies (see box). At the Institute of Biology Leiden, Remko Offringa, professor of Plant developmental genetics, and his team have discovered a gene that determines whether growing points of a plant will remain vegetative after flowering.

Life-extending effect

In the study, the researchers used the typical annual model plant thale cress, *Arabidopsis thaliana*. First author Omid Karami demonstrated during his doctoral research how the so-called AHL15 gene works. He overexpressed the gene in *Arabidopsis* so that it is much more active than normal. As with perennial plants, in the modified *Arabidopsis* plants some growing points remain in the vegetative phase. The plants continue to grow after flowering and can blossom several times. When the researchers disabled the gene, they noticed that the plants had a shorter lifespan than normal. By doing so, they demonstrate that the AHL15 gene, which they have named REJUVENATOR, regulates plant longevity.

Multiple harvests

The discovery of the gene contributes to fundamental knowledge about plant life history and -ageing, says Offringa. The gene may also provide answers to the question of why during evolution certain species have become annuals and others have become perennial. According to Offringa, practical applications are also conceivable, such as for agriculture. Many [food crops](#), like rice and wheat, are annuals. Keeping some growing points vegetative in such a crop would allow the plants to

continue to grow after harvesting. This may allow for several harvests from the same crop and thus to increase the yield per plant. Farmers also have to plough less often when they grow plants that bloom more often. As a result, the soil biome will remain intact, which fits well with sustainable production in agriculture.

Plants grow and develop leaves during the vegetative phase. Under the influence of changes in daylight and temperature, plants switch to the reproductive phase at a certain point. They develop flowers and produce seeds for reproduction. Some plants—including all annuals—die after flowering. Most perennial [plants](#) after flowering re-enter the vegetative phase in the following season. They develop new leaves through growing points located on the stem. Next, they can go into a new reproductive phase.

More information: Omid Karami et al. A suppressor of axillary meristem maturation promotes longevity in flowering plants, *Nature Plants* (2020). [DOI: 10.1038/s41477-020-0637-z](https://doi.org/10.1038/s41477-020-0637-z)

Provided by Leiden University

Citation: Longevity gene discovered in plants (2020, April 14) retrieved 3 May 2024 from <https://phys.org/news/2020-04-longevity-gene.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.