

Creating pollen-free trees to combat hay fever

August 9 2023



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Pollinosis, or hay fever, makes people miserable around the world, and Japanese cedar (*Cryptomeria japonica*) pollen is a significant cause of the suffering in the 38.8% of Japanese people who are allergic. Japanese

cedar is also the country's most important timber species. A single mature tree produces on the order of three hundred million grains of pollen.

Saneyoshi Ueno and colleagues investigated the [genes](#) required to produce this massive amount of genetic material. Previous research by Ueno's team identified a gene, Cjt020762, that seems to be required for pollen production. Mutants who carry broken versions of the gene make no pollen at all.

Now, another gene, CjTKPR1, found in a different locus, is also determined to be necessary for the production of pollen. The study is published in the journal *PNAS Nexus*.

Functionally, CjTKPR1 is required for construction of the wall of the pollen grain. Mutant trees with nonfunctional versions of this gene already exist and produce nearly no pollen. Knocking out this gene in the model plant *Arabidopsis thaliana*, rice, tobacco, and daisies led to male sterility in each case.

According to the authors, creating pollen-free commercially grown timber tree lines would be straightforward and desirable.

More information: Hiroyuki Kakui et al, A single-nucleotide substitution of CjTKPR1 determines pollen production in the gymnosperm plant *Cryptomeria japonica*, *PNAS Nexus* (2023). [DOI: 10.1093/pnasnexus/pgad236](https://doi.org/10.1093/pnasnexus/pgad236)

Provided by PNAS Nexus

Citation: Creating pollen-free trees to combat hay fever (2023, August 9) retrieved 29 April 2024

from <https://phys.org/news/2023-08-pollen-free-trees-combat-hay-fever.html>

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