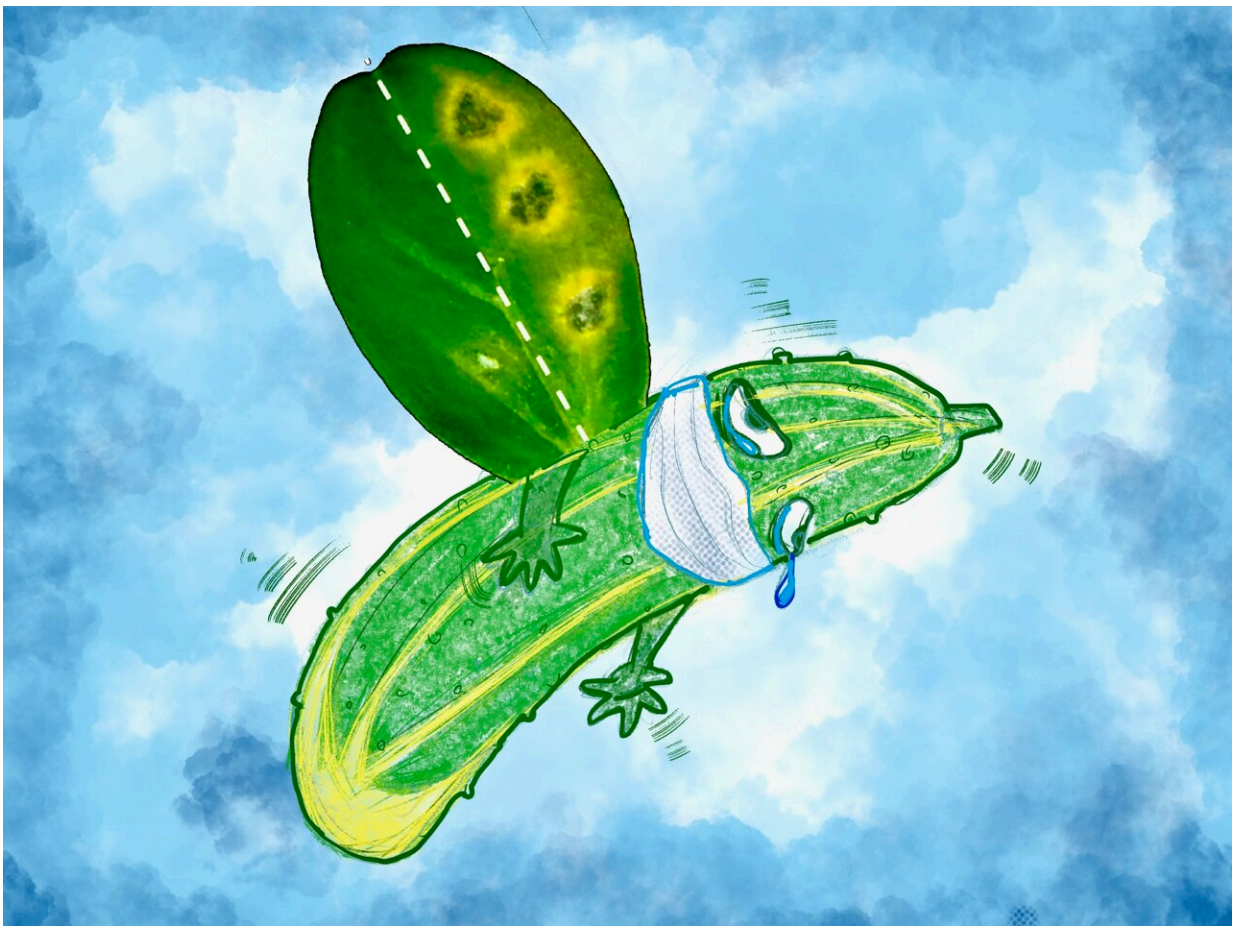


Scientists identify fungal proteins responsible for suppressing host plant immunity from infection

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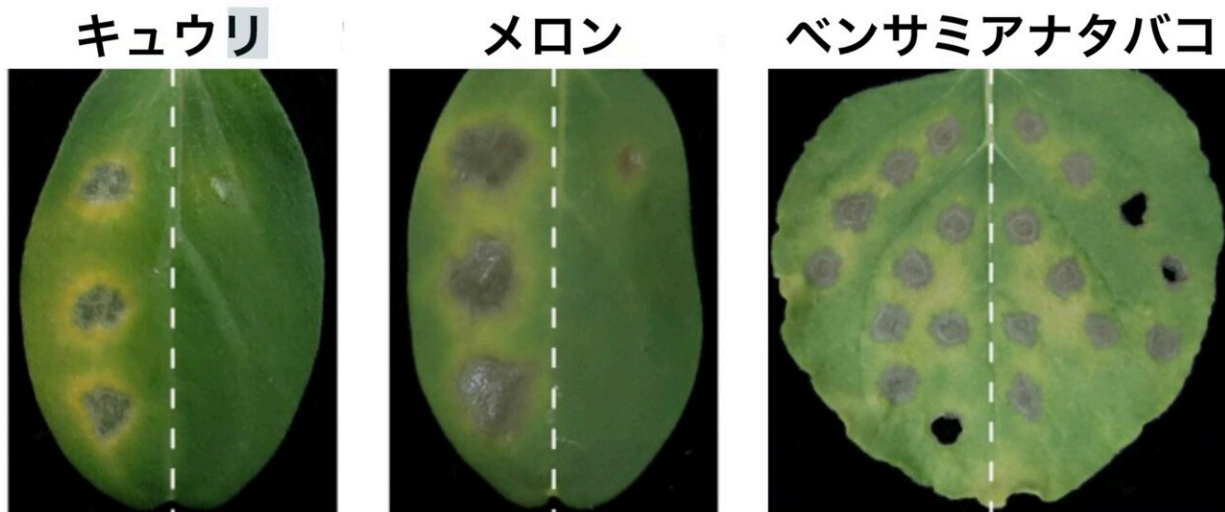
Cucumber leaf, along with melon and tenth, are studied for the effector proteins EPC1 to EPC4. Credit: KyotoU Tobiyama/Yoshitaka Takano

While infectious fungal plant diseases relentlessly wreak havoc on many crops, they are also picky when choosing their hosts. Each fungus generally exhibits a specific host range, but the mechanism of this specificity has not been well understood.

Kyoto University researchers have now identified and categorized four fungal proteins called effectors responsible for suppressing host plant immunity from infection. The paper "Selective deployment of virulence effectors correlates with host specificity in a fungal plant pathogen" appeared on March 20, 2023 in *New Phytologist*.

Phytopathogens are plant [pathogenic fungi](#) that secrete these effectors. As a result, the harmful fungus generally exhibits distinct host specificity when infecting plants, causing more than 70% of [plant diseases](#).

According to the researchers, the four [effector proteins](#) named EPC1 to EPC4 in *Colletotrichum orbiculare*—a phytopathogenic fungus—establish specificity on a host cucumber.



Deletion of four genes (EPC1 to EPC4) reduced pathogen virulence From left to

right: cucumber host, melon host, and benth host. Credit: KyotoU/Yoshitaka Takano

"The four effectors have very different amino acid sequences, suggesting that they work independently, but we need to continue analyzing the function of each effector to get a clearer picture," says lead author Yoshitaka Takano of KyotoU's Graduate School of Agriculture.

Takano's team used [functional analysis](#)—targeted gene disruption—on effector-like genes, which are highly expressed in six isolates of the inoculated pathogen.

"We have just cracked open a peephole to understand how effectors of phytopathogenic fungi shape host specificity. Our growing knowledge may lead to new crop protection technologies."

More information: Yoshihiro Inoue et al, Selective deployment of virulence effectors correlates with host specificity in a fungal plant pathogen, *New Phytologist* (2023). [DOI: 10.1111/nph.18790](https://doi.org/10.1111/nph.18790)

Provided by Kyoto University

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