

# Ultimately, beneficial fungi could be more effective than pesticides against nematodes

February 4 2021

---



Hschachtii on cabbage roots. Credit: J.O. Becker

Over the past 30 years, the use of soil fumigants and nematicides used to protect cole crops, such as broccoli and Brussel sprouts, against cyst nematode pathogens in coastal California fields has decreased dramatically. A survey of field samples in 2016 indicated the nematode population has also decreased, suggesting the existence of a natural cyst nematode controlling process in these fields.

Thanks to California's pesticide-use reporting program, nematologists have been able to follow the amounts of fumigants and nematicides used to control cyst nematodes over the past three decades. "Application of these pesticides steadily declined until they were completely eliminated in 2014 while, for example, broccoli yields continued to increase each year," said Ole Becker, a scientist with the Department of Nematology at the University of California.

In a study of 152 fields, Borneman, Becker and colleagues detected cyst nematodes in about 38% of them. Only a few of these fields had enough nematodes to potentially damage the crops. This showed that growers had likely reduced their usage of nematicides because of a natural decline in the nematode populations.

To identify the cause of this natural decline, Borneman, Becker and colleagues used cyst nematodes as a bait and found that a diverse population of fungi were likely killing the nematodes. The most abundant genus was *Hyalorbilia*, which contains species previously described as effective parasites of cyst and root-knot nematodes.

"The results from our baiting analysis combined with advanced molecular tools gave us a detailed depiction of the possible nematode-parasitizing fungi in these soils, which then provided a plausible explanation for this dramatic decrease in pesticide use," said Borneman.

Their research demonstrates the usefulness of monitoring plant-parasitic [nematode](#) density before using nematicides and increases the awareness of beneficial fungi in crop protection. These [fungi](#) might be considered as possible biological control agents for nematodes.

**More information:** Ying-Yu Chen et al, Detection of Nematophagous Fungi from *Heterodera schachtii* Females Using a Baiting Experiment with Soils Cropped to Brassica Species from California's Central Coast,

*PhytoFrontiers* (2020). [DOI: 10.1094/PHYTOFR-07-20-0009-R](https://doi.org/10.1094/PHYTOFR-07-20-0009-R)

Provided by American Phytopathological Society

Citation: Ultimately, beneficial fungi could be more effective than pesticides against nematodes (2021, February 4) retrieved 26 June 2024 from <https://phys.org/news/2021-02-ultimately-beneficial-fungi-effective-pesticides.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.