

Fungal Killer of Cypresses Originated in California

By JOHN UPTON OCT. 27, 2011

For the last five years, scientists have been on the trail of a fungus that has caused a deadly epidemic in the world's forests. The fungus, *Seiridium*, causes cypress canker disease, which has felled up to 95 percent of the cypress trees — a family that includes junipers — growing in some timber plantations and forests across the globe.

Last month, scientists from the University of California, Berkeley, and the National Research Council in Italy revealed that their genetic sleuthing had traced the pathogen's roots back to Monterey cypresses in California, where the trees grow naturally along seashores in the Bay Area and other coastal regions. The findings were published in the journal *Phytopathology*.

The discovery unearthed the grim consequences of the cypress tree's global popularity, while implicating climate change in ferocious fungus diseases attacking woodlands around the world.

Matteo Garbelotto, a forest pathologist at Berkeley and a member of the team of scientists, said in an interview that the problem began roughly a century ago. That is when landowners started planting Monterey cypress trees in California's arid Central Valley and Europe. The trees were prized for their wide, flat canopies, which can protect farms and homes from strong breezes.

Though Monterey's native cypresses remain resistant to the fungus, Dr. Garbelotto said, once the trees were uprooted from their native coastal homes, they became "weakened and more susceptible to infection." As the trees' immune systems grew weaker, the fungus grew stronger, until it prevailed in a struggle with its arboreal host that had spanned millennia.

In fact, the fungus in the transplanted trees became so prevalent that it saturated the air with its spores and burrowed into the bark of surrounding

Monterey cypresses and other nearby cypress trees, releasing poison, disrupting sap flows and leading to cankers that strangled the plants.

The scientists compared fungus genes from 96 cypress canker outbreaks around the world, and identified two major strains that led them back to California. "There's a lot more genetic diversity in California," Dr. Garbelotto said. "I was surprised that nobody had looked at this before."

The disease is on the attack on all six continents where trees grow. The Italian cypress, which is part of the Tuscan, Greek, French and Spanish countryside, is especially vulnerable. And in antipodean timber plantations, "cypress canker has been devastating," said Mark Self, a silviculture analyst at Timberlands Limited, a forestry management company in New Zealand.

Dr. Garbelotto likened the practice of transplanting trees in new climates, which can cause them to wither and die, to the effects of climate change. His and his colleagues' new research suggests that climate change could have dire implications for forests with weakened trees, allowing killer fungus species to grow to epidemic proportions and spread.

"If you have one species that's more susceptible than the others, that could help a pathogen build up," Dr. Garbelotto said. "All of a sudden it starts affecting other species."

Dr. Garbelotto said that he worried that climate change could heighten the fungus-related effect of sudden oak death and Dutch elm disease, which already are felling millions of trees around the globe.

jupton@baycitizen.org

A version of this article appears in print on October 28, 2011, on page A21A of the National edition with the headline: Fungal Killer Of Cypresses Originated In California.