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Oak disease variant looms as new threat
Third strain may be offspring of U.S., European types

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A previously unknown strain of the tree-killing disease known as sudden oak death has been found in a nursery in Washington state, a possible mutant child of the fast-spreading pathogen.

The discovery means that the European version of the disease has not only found its way to America, but may have mated with its California counterpart, which has killed tens of thousands of oak trees in the state.

"We detected a third strain with traits from both the U.S. and European strains," said UC Berkeley forest pathologist Matteo Garbelotto during the three-day Sudden Oak Death Science Symposium in Monterey. "It has some genetic traits in the DNA that we've never seen. It's a unique strain."

The fear is that the product of any such union could end up being a fungal version of Rosemary's baby.

"The obvious risk," said Jonathan Jones, who manages the sudden oak death program for the U.S. Department of Agriculture's Animal and Plant Health Inspection Service, "is that there could be sexual recombination, and we could end up with something worse than what we have."

The symposium, which ended Friday, marks only the second time the world's top sudden oak death scientists have been brought together to discuss the disease, known scientifically as Phytophthora ramorum.

Garbelotto, who helped discover Phytophthora ramorum and has been one of the top scientists in the field, said there is no reason at this point to be alarmed about the new strain, which, he said, has "not been particularly aggressive on oaks."

It was found over the summer on a plant in a nursery where P. ramorum's American and European mating types -- the equivalent of a male and female of the same species -- were known to exist.

The European strain has been deadly to England's ubiquitous rhododendrons and beech trees, but it wasn't until 2003 that it was detected in a nursery in British Columbia. It has since been found in nurseries in Oregon and Washington.

The discovery of the third strain could mean the American and European types mated and produced this new strain, but Garbelotto said that is not necessarily the case.

"One hypothesis is that it is the result of recombination," he said. "The other hypothesis is that it's a representative of the species that predates the split between the European and U.S. mating types and it was introduced separately. It's interesting because it offers us another clue into the origin of this Phytophthora species. Maybe we can find out where this plant came from and trace the disease back."

Scientists have long suspected that the pathogen was an exotic species introduced to America and Europe from some far off place, most likely Southeast Asia. Genetic evidence collected as a result of the sequencing last year of the P. ramorum genome, supports that theory. In fact, said Garbelotto, the California outbreak appears to have come from a single alien microbe that hitched a ride to the Golden State, cloned itself millions of times and then did its dirty work.

"All the evidence points to the fact that it was introduced," Garbelotto said. "It doesn't have any genetic features of a native species. There is very little genetic diversity in the species in North America. They are essentially clones. In other words, everything can be traced back to one individual."

None of which offers any relief to the nursery industry, whose earnings suffered a near-meltdown last year, after the microbe was found in ornamental plants shipped from a Southern California nursery. The infestation led to a nationwide quarantine of nursery products from California. A recent federal order extended the quarantine to include Oregon and Washington. It is all costing the nursery industry millions of dollars in lost sales revenue and inventory destruction.

Garbelotto and others expressed support at the conference for measures that would halt shipments of nursery plants and material in favor of seeds or cell cultures.

"This situation is a good example of why the movement of plants should be checked," he said. "Almost every major plant and tree disease we've ever had was brought here by bringing plants and plant material."

Among the diseases that are believed to have been spread by the importation of exotic plants was the chestnut blight, which

killed entire forests of American chestnut trees, and Dutch elm disease, which obliterated American elms in the northeast United States.

The Dutch Elm Phytophthora was, in turn, exported to England, where it mutated into a more virulent form and wiped out elm trees throughout the United Kingdom starting in the 1960s.

The apparent movement to cut off the ornamental plant trade was met with dismay by the nursery industry.

"There is a reason why California is the biggest nursery state in the country: We grow and sell plant material that beautifies the environment," said Steven Knudsen, who owns Knudsen Nursery Inc., an Oakdale (Stanislaus County) business started by his father and uncle. "To suggest we not sell plants across the state is, well, in my opinion it would shut down the entire industry."

Some researchers at the conference said that sudden oak death is merely a symptom of worldwide forest decline and that P. ramorum has always been around to attack weakened trees.

Lee Klinger, an independent scientist from San Anselmo, said the real culprits are mosses and acidification due to, among other things, suppression of forest fires and the extermination of California Indians who once managed the oak savannas.

His contention that P. ramorum has always existed, however, seems to be directly refuted by the genetic evidence presented by Garbelotto.

And while everyone is talking about sudden oak death, a new, even more virulent Phytophthora called kernoviae has emerged in Britain.

Stephen Hunter, the head of plant health for the Department for Environmental Food and Rural Affairs in Britain, said the new, unrelated microbe has attacked historic gardens near Cornwall elsewhere in southwest England, where it is threatening to wipe out sparse woodlands.

"The disease itself seems to be progressing more rapidly than ramorum," Hunter said. "There is a lot of concern."

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