

Sudden oak death genome mapped

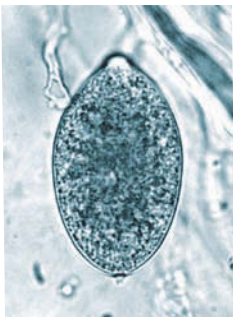
The entire DNA blueprint for *Phytophthora ramorum* — the pathogen that causes sudden oak death — has been sequenced, scientists with the Joint Genome Institute (JGI) announced in June. The nonprofit institute is operated by UC for the U.S. Department of Energy.

Mature oak trees began mysteriously dying from sudden oak death in the mid-1990s; UC scientists identified and diagnosed *P. ramorum* as the culprit in 2000. JGI scientists, who collaborated with the Virginia Bioinformatics Institute, announced that *P. ramorum* has 16,000 genes and 60 million chemical DNA units (base pairs). (Humans have 25,000 to 30,000 genes and 2.9 billion base pairs.)

Concurrently, JGI announced the sequencing of *Phytophthora sojae*, which causes root rot in soybeans. The genome sequences are expected to help scientists develop rapid detection systems and methods to control the spread of sudden oak death, which has killed tens of thousands of trees, and the soybean disease, which causes an estimated \$1 billion in crop losses annually.

As of June, *P. ramorum* had been found in 13 California counties and southern Oregon, as well as 125 nurseries in 17 states nationwide. In April, wood rose (*Rosa gymnocarpa*), a native California flower commonly found in a variety of habitats and a popular ornamental, was added to the list of about 30 regulated *P. ramorum* host plants.

Courtesy of Matteo Gabelotto



***Phytophthora ramorum*, the pathogen that causes sudden oak death.**

No safe place to sit in tick-infested forests

Resting on a log or leaning against a tree in California's tick-infested hardwood forests can increase the risk of acquiring ticks harboring the Lyme disease bacterium, UC Berkeley researchers found.

"We sat on logs for only five minutes at a time, and in 30% of the cases, it resulted in exposure to ticks," said Insect Biology professor Robert Lane. "The next riskiest behavior was gathering wood, followed by sitting against trees, which resulted in tick exposure 23% and 17% of the time."

The study, published in the March *Journal of Medical Entomology*, is the first quantitative analysis of human behaviors that may increase the risk of tick exposure in California's hardwood forests. Lane and study co-author Denise Steinlein, a UC Berkeley graduate student in insect biology, conducted the research at the UC Hopland Research and Extension Center in southeastern Mendocino

County. UC Berkeley research specialist Jeomhee Mun is also a co-author.

The western black-legged tick, found primarily in the far western United States as well as British Columbia, is the primary carrier of the corkscrew-shaped spirochete *Borrelia burgdorferi*, which is responsible for Lyme disease (see *California Agriculture* 55[6]:13–8). The young nymphal ticks that generally spread Lyme disease are notoriously difficult to detect. California's nymphal tick season begins in early spring and continues into summer.

DNA tests revealed that 3% to 4% of the ticks the researchers found on their bodies, as well as by sampling leaf litter with a white flannel cloth, tested positive for *B. burgdorferi* and another, less prevalent human disease-causing bacterium, *Anaplasma phagocytophilum*.

West Nile virus spreads

As of June 22, California health officials had confirmed seven human cases of West Nile virus (WNV) in 2004, including a 61-year-old San Bernardino County man hospitalized with encephalitis. The virus, which is transmitted from birds to mosquitoes to humans (or horses), has also been confirmed in nearly 500 dead birds in Los Angeles, Riverside, San Bernardino and Ventura counties.

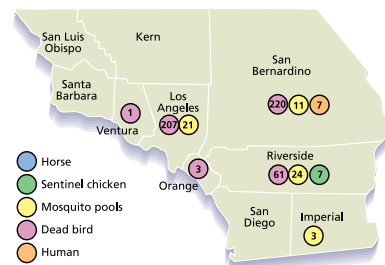
"What the dead birds are telling us is that there's a lot of virus circulating out there," says John Edman, director of the UC Davis Center for Vectorborne Diseases (UCD/CVB). "We're in a high state of alert."

UC Davis scientists are collaborating with the California Department of Health Services, California Department of Food



Photos: Robert Lane

The researchers wore white clothing from head to toe, and engaged in a series of typical outdoor activities to attract ticks, such as sitting on logs and leaning against trees. Top, Denise Steinlein carries wood at the tick-infested UC Hopland Research and Extension Center. Bottom, the nymphal stage of the western black-legged tick, which can carry the spirochete that causes Lyme disease, is the size of a poppy seed.



As of June 22, 2004, California's surveillance network had detected West Nile virus in humans; dead birds; aggregate pools of mosquitoes; and sentinel chickens, which have their blood drawn and tested biweekly. No infected horses have been found. Source: www.westnile.ca.gov