Sudden Oak Death Infected Bay Laurel in San Francisco & West Sonoma County

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Introduction

Phytophthora ramorum is a pathogen that can cause Sudden Oak Death (SOD) and can lead to mortality in some tree species. Our trees of study, California bay laurel (*Umbellularia californica*), are not killed by infection from *P. ramorum* but are a major vector of the pathogen to other tree species. To better understand the spread of *P. ramorum* in northern California, we performed a field study to explore how SOD-infected bay laurel populations differ between San Francisco and western Sonoma County. We assessed the abundance of SOD infected bay laurel in two locations in each county, collecting from 3-5 trees at each sampling location. At each tree, we counted the number of infected bay leaves we could see in 90 seconds. Our results showed a higher number of SOD infections in bay laurels in rural areas (Sonoma County) than in urban areas (San Francisco). We hope our results will help understand the spread of SOD throughout Northern California habitats and inform the community about the effects of this pathogen that impacts the biodiversity of local plants and animals.

Materials & Methods

We conducted our experiment in San Francisco and West Sonoma County using methods from a previous study (Anacker et al, 2008), mirroring the same steps in each area:

- Find two locations that have bay laurel trees
- Collect data from 3-5 trees in each location
- At each tree we looked up and recorded the number of SOD infected leaves we saw for 90 seconds

After collecting the data from both locations, we graphed them to compare and see the differences in infection rates between rural and urban areas.

Figure 1: This shows bay laurel trees in West Sonoma County (Austin Creek, Cazadero) This is an example of one of the locations we collected data from

SOD Symptoms

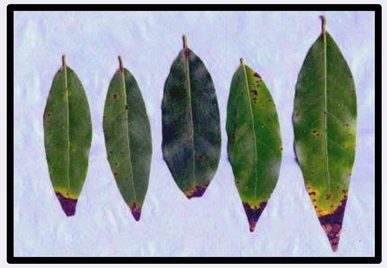

Figure 2: This photo shows bay laurel leaves that were exposed to *Phytophthora ramorum*. Tip discoloration or leaf blight, as shown here, is a common symptom of Sudden Oak Death in bay laurel.

Figure 3: This photo shows a coast live oak after being infected by *Phytophthora ramorum.* Unlike bay laurel, sudden oak death can be fatal for coast live oaks, and they experience different symptoms, as shown here. Unlike bay laurel different symptoms, including cankers, which are areas of dead tissue.

Data

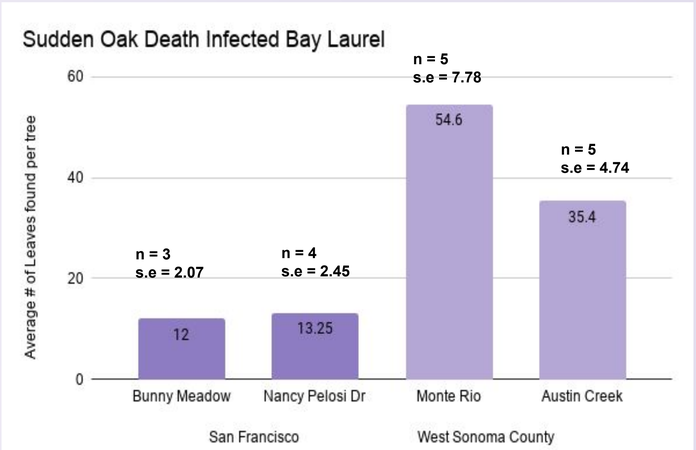

Figure 4: This graph presents the data we collected from bay laurel trees in San Francisco and West Sonoma County. The columns display the average number of leaves we found for each location. This data supports our initial prediction that the abundance of Sudden Oak Death infected bay laurel is much higher in rural areas than in urban areas.

Discussion

Significance

Our project results help us and other researchers understand the areas where Sudden Oak Death infections are higher and need monitoring and the risk they pose to other trees. Although Sudden Oak Death is not fatal to bay laurel trees, they are a great tree to observe to determine the amount of SOD in a given area. Furthermore, it is essential to know infection rates of bay laurel as researchers believe SOD spreads to oak trees from bay laurel. Once bays are infected, they produce spores that can further spread the infection and kill oak trees. Communities in urban and rural areas should care about how this disease can impact trees and the surrounding ecosystems in their area.

Future directions for research

Based on our results, we believe it is important for researchers to study and monitor rural areas as they pose a higher risk for SOD. Rural regions like West Sonoma County have more biodiversity that needs preservation and further research regarding the management and spreading of SOD.

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