



CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

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| Name(s) Trevor Cambron; Natalie Owens | Project Number S0905 |
| Project Title Trails, Soil, and SOD | |
| <p style="text-align: center;">Abstract</p> <p>Objectives We are studying <i>Phytophthora ramorum</i>, a water mold which is killing tanoaks and causing a foliar infection on Bay laurels in Santa Cruz County. Sudden Oak Death threatens the survival of oaks, an important keystone species, and creates a significant fire danger because of the large amounts of dead trees. The pathogen produces infective spores in wet weather, which are then spread through wind-driven rain, runoff, plant material, and soil. Based on observations from previous tests, we wanted to know if there was a relationship between proximity to trail and infection rate. We hypothesized that the infection rate would be higher closer to the trail and lower deeper in the forest. We also hypothesized that we would find a strong positive correlation between Bay laurel abundance and infection rate and a moderate positive correlation between tanoak abundance and infection rate.</p> <p>Methods To test this, we collected leaves from 25 tanoaks at 5 distances from the trail in 3 plots in the San Lorenzo Valley and cultured them on VARP media for 10 days. We then microscopically identified whether or not each sample was infected with SOD. To look at the density of the forest, we counted the number of tanoaks and Bay laurels within 5 meters of each sampled tree and ran a linear regression relating tree abundance to infection rate. Additionally, we tested the soil along the trails using aqueous leaf baiting and immunostrips.</p> <p>Results We found that the infection rate was higher closer to the trail, and we then performed a T-Test and a Linear Reg T-Test. Based on these tests, we have statistically significant evidence that Sudden Oak Death infections are more common closer to the trail. However, we lack statistically significant evidence of any correlation between Bay laurel or tanoak abundance and infection rate. Also, we were able to detect the pathogen in the soil along the trails.</p> <p>Conclusions Since we found a higher infection rate closer to the trail rather than deeper in the forest, it is possible that the trail itself is a huge factor in how the pathogen spreads. To help combat SOD, we plan on building a boot washing station so that the disease is not transported outside of the forest.</p> | |
| Summary Statement After culturing and running significance tests, we have statistically significant evidence that Sudden Oak Death infections are more common closer to the trail. | |
| Help Received Dr. Michael Loik, UCSC answered questions that we had, and Douglas Schmidt and Matteo Garbelotto, UC Berkeley, donated culturing materials. | |