Trails, Soil, and Sudden Oak Death

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We are studying Phytophthora ramorum, 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. 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. We concluded that the infection rate was higher closer to the trail, after performing a T-Test and a Linear Reg T-Test. We believed that forest structure could explain this pattern. We 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. 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. Based on a LinReg T-Test, we lacked statistically significant evidence of any correlation between Bay laurel or tanoak abundance and infection rate. Additionally, we tested the soil along the trails and detected the pathogen. We plan on building a boot washing station so that the disease is not transported outside of the forest.

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