CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY

Name(s)

Yurika K. Yoneda

Project Number

31964

Project Title

Determining the Biomass of Eriogonum fasciculatum in a Coastal Sage Community

Abstract

Objectives/Goals

This project was designed to establish a correlation between the dry weight measurements and the canopy area and volume and develop an equation to formulate biomass estimates of Eriogonum fasciculatum in the coastal sage community.

Methods/Materials

Fifteen samples of Eriogonum fasciculatum shrubs in various sizes and aspects were collected from Forrestal Palos Verdes Land Conservancy. Canopy height diameter, and circumference in meters were recorded to calculate the area and the volume. These samples were then separated into branches, leaves, and flowers and were placed into the air-forced drying oven for 48 hours at 75 degrees Celsius to measure the dry weight mass in grams. The samples were analyzed for the biomass-size relationships of coastal sage buckwheat using dimensional analysis to develop regression equations.

Results

The results showed that total biomass correlated with the canopy area and volume. The equations relating biomass to canopy area and volume for the fifteen shrubs can be represented with the linear regression best fit equation y=170.08x+87.346 for the canopy area vs. biomass and y=102.953x+72.207 for the canopy volume vs. biomass. The r^2, or the coefficient value of the biomass vs. the canopy area is .9737, which is very high and therefore is a very accurate data. The r^2 coefficient value of the biomass vs. canopy volume is .9492 which is strong and therefore is a very accurate data to predict the relationship between the volume and the dry weight mass.

Conclusions/Discussion

In this study, there appeared to be a surprisingly strong positive correlation between the biomass and the size of Eriogonum fasciculatum. All graphs were positive indicating the canopy area and volume increases when there is a proportionally increase in biomass. This equation could now be used to predict the biomass measurements for other scientists# use and applicability. It would be interesting to repeat this experiment in a different community and compare the results while determining the carbon intake of these plants. This is an initial step in determining if this could be applied to other plants as well.

Summary Statement

This project is a biomass analysis of Eriogonum fasciculatum in a coastal sage community, developing an equation to formulate biomass estimates of the California buckwheat.

Help Received

Mother helped me drive to the field, Forrestal PV Land Conservancy; Mr. Starodub let me use his drying oven; Mrs. Dalkey from the PV Land Conservancy and Dr.Sharifi helped answer questions about the native plants.

Preliminary