

Introduction

For this experiment I want to know how many orchids and bromeliads, which are epiphytes, have grown from the main four trees where the epiphytes were relocated to a year before. I believe that there will be two or three orchids or bromeliads per tree. These two species are similar but at the same time different.

Orchids are the largest family of plants with a number of species ranging from 25,000 to 30,000 and where at least 10,000 of the species can be found within the tropics. True black is the only color that the orchid blossoms do not produce. All orchids have six flower parts, which are three green sepals for the outer part and in the inner part they are the three colorful petals. Orchids can be subterranean, terrestrial, epiphytes and lithophytes. If they are subterranean they live underneath the soil, terrestrial is on land, Epiphyte means they grow in trees, and lithophyte means they grow on rocks. Orchids get their nourishment from the moisture in soil, rain, or the air. Some orchids are self-pollinating, but most rely on certain birds and insects to be pollinated.

There is a fungi called mycorrhizae that has a symbiotic relationship with the orchids, where the fungi helps absorb minerals and water while the plant will produce nutrients that help the fungi survive. This is all needed because the orchids lack a true water-retentive root system. Orchids can live just about anywhere except where it is frigid and the environment has arid extremes. The orchids are able to grow in different tropical countries and some grow only in certain habitats or countries.

The first one is known as pantropical and the second one is known as endemic. While most orchids grow in tropical rainforest some are found in semi-desert regions and seashore and tundras. Since some orchids rely on a specific bird or insect for pollination, the orchids will die out if their pollinators disappear or are killed off.

There are several epiphytes in the world close to 30,000 cataloged and several that are not cataloged. Epiphytes are found in rainforest but can be found in the cloud forest which is a forest with a fog-laden elevation of 3,300 to 6,600 feet. Epiphytes are made up of 83 families which are made up mostly of flowering plants and ferns. Orchids represent eight percent of all the flowering plants in the world. Many orchids are found in microhabitats such as valley systems, or certain canyons. A microhabitat is a small or limited space which differs from the habitat from the surrounding the small area. Orchid seeds are very tiny that are measured by the microns, which are found in the hundred of thousands. Each plant attracts a different species of insect or birds, certain plants only attract one type of species, for example is the *Angraecum sesquipedale* with the hawkmoth that looks somewhat like a hummingbird. The hawkmoth's tongue is over fourteen inches long so it can just reach the nectar of *Angraecum sesquipedale*. The rat-tail orchid is a well-known orchid it is also known as the *Dockrillia Teretifolia*. The rat-tail orchid is known as such because of the shape and the look of the leaves.

The bromeliaceae are very similar to orchids in look, but are quite different. They have a over 2,700 species. The pineapple is the most well know bromeliad. The bromeliads usually have bright orange, red blue or purple flowers. Bromeliads can be terrestrial, saxicolous, or epiphytic. Bromeliads that live in trees have prolific roots to cling to tree trunks and specialized hairs that gather water and nutrients. Bromeliads can spread by the birds and mammals that eat their berries or seed that are spread through the wind. The Bromeliads will grow off of the feces and nutrients life behind other animals and insects. Tessertial is to grow in the ground, and epiphytic is to grow in the trees, while saxicolous is growing on rocks. Bromeliads are known in the Neotropics. Bromeliads can support a small ecosystem. Some of the animals will spend their whole lives in the plant. Bromeliads bloom only once in their life time. When the Bromeliads are getting ready to bloom, the leaves will sometimes change color. The “pup” is the little pods that are the next generation of offspring that the Bromeliads produce once it is done blooming.

Materials

A pencil

A notebook

A tape measure, or a meter stick

A Camera

Memory Card

Method

I went out and to the grapefruit grove where, the previous team of students planted the orchids. I counted of a certain number of rows and columns marking the trees that had the orchids originally placed on them, I then made a map of the area that I counted the orchids to keep track of how many trees I counted and how many orchids were on the tree. I marked off where I would start and begin. I included the trees of where the original transplanted orchids were. I went down by row marking how many orchids were on each tree. In that row, using my camera to capture, the species and where they where at. Then I would go over to the next column and go up that row. I would repeat the process until I reached the end of the area I was working on. After I had counted all the orchids and bromeliads, I measured how far the trees were from each other and how large the grove was. After I was done I tallied how many orchids and bromeliads I had from the trees.

Results

In the 24 trees that we counted, there were a total 43 orchids and bromeliads. There was an average of 1 orchid or bromeliad per tree. There was an instance were there was a maximum of six epiphytes on a tree, and there were 2 trees that did not have epiphytes.

The trees were placed approximately every 5 meters squared, so there would be 160 trees per acre. I counted in the grapefruit grove there was 315 trees, which made the grove 2 acres. With these estimations, we can predict that it will take up to 13 years to cover 2 acres of trees.

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|-----|-----|-----|-----|
| X-3 | X-1 | X-0 | X-2 |
| X-1 | X-3 | X-0 | X-1 |
| (X) | X-1 | X-1 | X-5 |
| (X) | X-2 | X-3 | X-3 |
| (X) | (X) | X-3 | X-1 |
| X-1 | X-1 | X-1 | X-2 |
| X-1 | X-1 | X-4 | X-1 |

Conclusion

I estimated in the beginning that there would be an average of 2 orchids or bromeliads per tree, and in the end there was only an average of 1 orchid or bromeliad per tree. In my data, errors have to be accounted for. Some errors would be, not counting enough trees that might have had an orchid or bromeliad already on them, it was also hard to count the orchids and bromeliads that were high up in the trees and that were in direct sunlight where I could not get a good look. Most of them were small and hard to find.