

Palo de rosa

**Research on five threatened and endangered plant species of Puerto Rico:**

*Calyptronomia rivalis, Daphnopsis helleriana, Schoepfia arenaria,  
Stahlia monosperma, and Zanthoxylum thomasianum*

**Final Report**

submitted to the U. S. Department of the Interior,  
Fish and Wildlife Service  
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*Barrio Candelaria locality*

Three individuals of *D. helleriana* were found at Barrio Candelaria, near the the boundary with Barrio Sabana Seca, both in the Municipality of Toa Baja (Figure 22). These plants were located in a property owned by the United States Navy that is administered by the Caribbean Primate Research Center of the University of Puerto Rico. Access to this area requires entering throughout the U.S. Navy Radio Station gate, located at the nearby Barrio Sabana Seca. Thus, this area is commonly referred to as the "U.S. Navy Base at Sabana Seca" or the "Caribbean Primate Research Center at Sabana Seca". The three plants found occurred at 50-70 m from sea level, with an eastern exposure. These individuals did not reach a meter in height (average 0.67 m, S.D. 0.115) and had relatively small basal area (average 0.843 cm<sup>2</sup>, S.D. 0.092). This locality is very close to the limestone hill where the species was reported in 1981 (Status Survey by J. Vivaldi and R. Woodbury). The locality found by Vivaldi and Woodbury comprised 10 plants. These ten plants were not located during our field search.

During our search for *D. helleriana* at Candelaria, we found four individuals of the federally listed *Ottoschulzia rhodoxylon* and three individuals of the rare *Erythrina eggersii*. They were growing in the same general area where we found *D. helleriana*. The tallest individual of *Ottoschulzia rhodoxylon* was a large about 14 m height, and had propagules and juveniles under or close to its

shade. *Erythrina eggersii* (about 8-9 m height) was easily recognized by its spiny, redish-brown bark. No signs of reproduction were observed in this species.

Of the localities studied, that at Cerro Alto exhibited the largest variety of height and basal area (Figures 23, 24). It also included the largest individuals seen by us for this species. Largest basal area and largest height were recorded in two different individuals. The tallest plant recorded (with a basal area of 113.1 cm<sup>2</sup>) was a female of 5 meters height. Individual with the largest basal area (2.3 m tall) was a one-stem female plant of 598.29 cm<sup>2</sup>.

### **Reproductive status and phenology**

During this study, we confirmed the sex of seventy one of the one hundred eighty four plants reported. The other individuals were either immature or did not reproduce during the time of our field activities. Forty five of all reproductive plants were females, twenty six were males, resulting in 1.73 females per each male found. We must emphasize that this is the proportion observed during our study. Because the sex of little over half of the individuals from the localities is still unknown, sex proportions could very likely change as more data is available. Most of the flowering was observed at Cerro Alto, especially along the lower terrace. At Cerro Alto, we identified twenty five male plants and forty two female plants, with twenty four of the females fruiting. We occasionally observed very

small plants on the forest floor, suggesting that recruitment is occurring at Cerro Alto. Very few individuals from the Guajataca Commonwealth Forest (only four) were observed flowering. The single plant sexed at Vereda Ramón Morales 1 was a female, whereas two females and a male were found at Vereda Salomé. When comparing sexes and plant sizes, we found that females exhibited broader range in height (from 0.5 m to 5 m) and basal area (from 0.8 cm<sup>2</sup> to 598.29 cm<sup>2</sup>) than males (height 0.8-3.5m; basal area 0.8-188.69 cm<sup>2</sup>). However, average measurements of reproductive plants were not significant between sexes. Average height for both sexes was 2 meters. Average basal area for males was 22 cm<sup>2</sup>, and for females was 29 cm<sup>2</sup>.

We gathered leaf, flower, and fruit phenology data during one year at the Cerro Alto locality. During that period, over half of the plants exhibited young leaves at the tip of their stems (Figure 25). Reproductive structures were observed throughout the entire year. When flowers were present, female flowers were usually more abundant than male flowers, peaking at the end of the year, and during the dry season (January-February to early May, Figure 26). Most male flowers were observed during the dry season, but they were also observed during other months of the year. Immature fruits were most abundant between January and May. Mature fruits were seen in March, April, May, July, August and December. The total amount of mature fruits observed were just a small fraction

of the green fruits produced. This could be the result of abortion of green fruits, or that ripe fruits fall to the forest floor shortly after ripening, or that they are taken away by birds or bats.

### **Threats**

Major threats of the Cerro Alto plants include cutting of the vegetation for fence posts, which is at present a common activity in the forest tracts of the Guajataca River gorge. Furthermore, there has been interest in developing the River gorge as part of housing and tourist projects. These activities may involve considerable land modification, increased production of garbage, use of pesticides, and introduction of exotic plant species for gardening. This will be very detrimental to the forests of the Guajataca River, which is considered one of the most diverse land tracts in Puerto Rico. Plants at the Guajataca Commonwealth Forest are relatively protected. However, management and public activities designed for the forest must take into account the existence of such locality.

The Locality of Candelaria is in extreme danger of being lost because it is located in the Metropolitan area, which is going under an uncontrolled process of development. Squatters could make a negative impact to the species, because of their need to clear the vegetation to settle and construct. Urban sprawl is

exacerbated by the proximity to Highway PR 22 which makes nearby lands very attractive for development. In addition, a municipal dump is permanently modifying some of the karst knolls in the vicinity. Expansion of the dump will eliminate this locality.

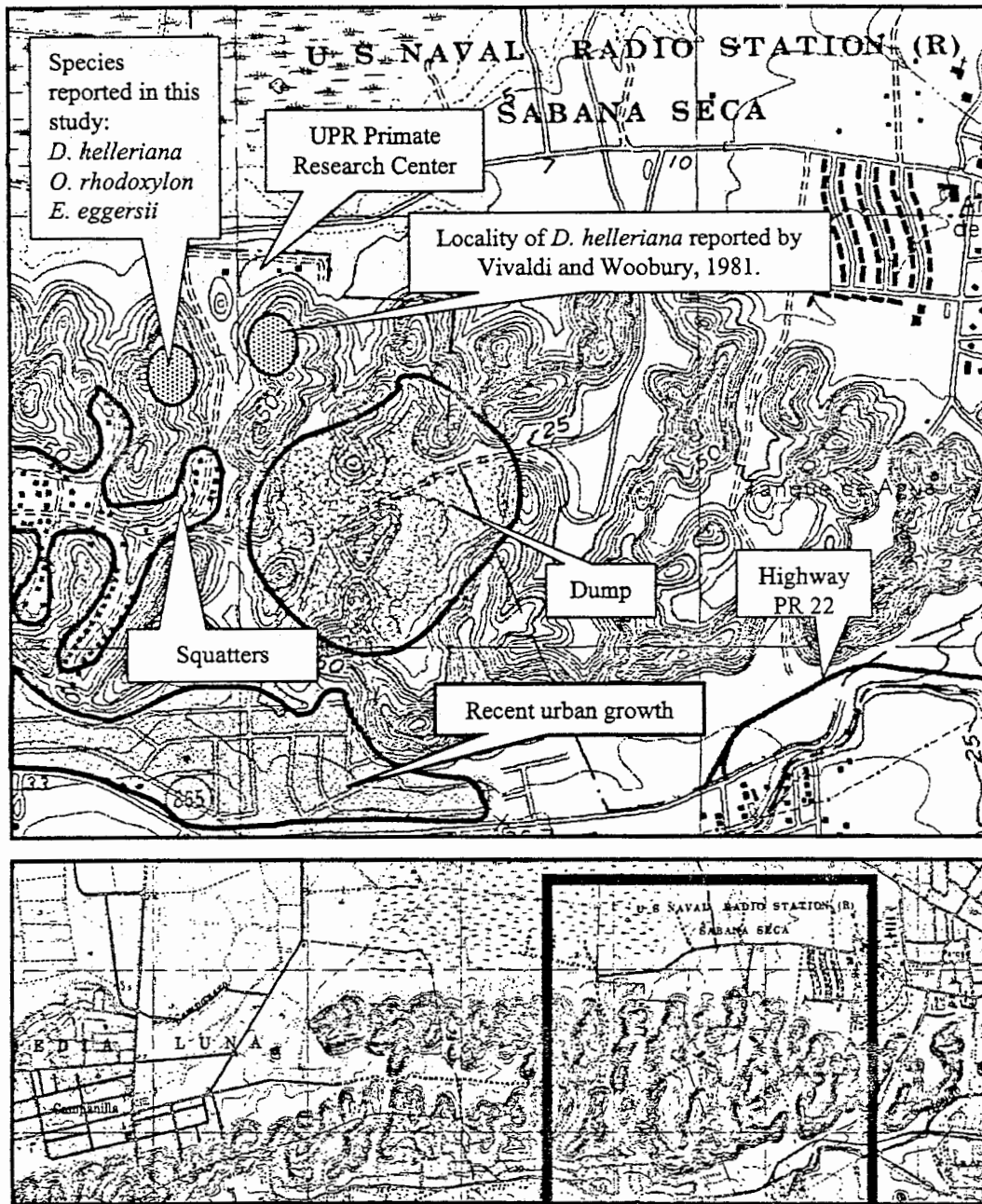


Figure 22. Locality of *Daphnopsis helleriana* at Barrio Candelaria (municipality of Toa Baja). The map also indicates a locality of *D. helleriana* reported by J. Vivaldi and R. Woodbury in 1981, as well as current threats for the locality reported here.