



HORTI SELBYANI

OBSERVING CALADIUMS IN THE NORTHERN RANGE OF TRINIDAD

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The island of Trinidad in the West Indies has three mountain ranges—Northern Range, Central Range, and Southern Range. The Northern Range, with the highest elevation of the three, also has the highest point on Trinidad, Mt. Aripo at 940 m. During a botanical expedition to Mt. Aripo in July 2005, a preliminary study was made of roadside caladiums. Four *Caladium* species (*C. bicolor*, *C. picturatum*, *C. humboldtii*, and *C. schumburgkii*) are found on the island (Boos & Boos 1993), and throughout the Northern Range, *Caladium bicolor* is a common roadside plant.

Caladium bicolor is found in and around Port of Spain, the capital of Trinidad, on the western side of the island and southern side of the Northern Range. These plants, for the most part, have leaves with no pattern. The occasional plant has spots on the leaf blade, with the number and color of spots varying. Blades with a few charreusse spots and blades with many small white spots were observed. Some plants had red pigment at the point where the petiole attached to the blade and along the edge where the lobes join. No brightly colored patterns were observed in this region of the island.

Caladium bicolor generally starts blooming shortly after breaking dormancy. The emergence of the leaves is initiated by the first heavy rains that mark the beginning of the rainy season. On Trinidad, this occurs in June or July (J. Boos & H. Boos pers. comm.).

In July 2005, flowering was observed several times in a population of 60–80 *Caladium bicolor* plants in the old riverbed at the base of the

mountain along Lady Chancellor Road near the Royal Botanic Gardens. The area of the population was ca. 36 × 15 m. Most of the plants had plain green leaves, but a few had red pigment at the attachment of the petiole and along the margin where the lobes join. No spotting was seen in this population. Some spotting, however, was seen in plants growing nearby, perhaps within the effective range for sexual reproduction. During three visits to this site, determinations of the number of inflorescences and the state of maturity of each inflorescence were made (TABLE 1). Inflorescences were classified as immature, blooming, or past blooming. If the inflorescence was blooming, the stage of development (anthers immature and stigmata receptive or anthers mature and stigmata not receptive) also was determined.

Even though this population was in very bright light, the number of inflorescences observed, 12, was small. Only one of the plants showed any development of seeds. Sexual reproduction apparently occurs in this population, but not at a high rate, suggesting that the major form of reproduction in this population is asexual. Exactly how long this population had been blooming is not known. Whether the inflorescences observed represented the beginning or the end of the blooming period or some stage in between was uncertain.

Little is known about the pollination biology or dispersal of diaspores for the genus. The inflorescences are protogynous; ovules at the proximal end of the spadix mature first. Anthers dehisce and release pollen the following day, when

TABLE 1. Number of inflorescences and stage of maturity of *Caladium bicolor* in a population of 60–80 plants along Lady Chancellor Road, Port of Spain, Trinidad.

Date	Inflorescences		
	Immature	Blooming	Past blooming
8-Jul-05	3	2	1 (ovules rotted)
18-Jul-05	3	1	1 (seeds developing)
28-Jul-05	1	0	0

pistils are no longer receptive, thus effectively preventing self-pollination. For pollination to occur, two inflorescences must be blooming within the effective distance of the pollinator, and one of the inflorescences must be a day older than the other. The disadvantage of this system is that the number of inflorescences must be high enough to have both stages of blooming present on the same day, and the inflorescences must be close enough for the pollinator to move the pollen from one inflorescence to the other. In general, the very first inflorescences and the very last inflorescences of a blooming season have little chance of being pollinated. Further study is needed to identify the pollinator of caladiums, the proximity between inflorescences for pollination to occur, and the agent of dispersal of the plant's diaspores.

Many colorful caladiums with considerable variation were found along the Blanchisseuse Road that runs between the towns of Arima, south of the mountains, and Blanchisseuse, on the northern coast of the island. Caladiums commonly grow in the wet, heavy, argillaceous soils

along the road. Phenotypically, the plants show a much greater variability than those around Port of Spain. Plain green leaves are present, but in the minority. On plants with spotted leaves, the spots vary in size, number, and color. Plants having blades with just a few spots are found growing with plants having blades with many spots. The spots may be chartreuse, white, pink, or red (FIGURE 1A). In one case, the spots were the result of the lack of pigment in the mesophyll that created translucent spots in the blade.

Some of these caladiums had a more or less solid pattern in the center of the blade. The extent of this pattern varied. In some plants, the pattern was confined to the main vein and the major lateral veins. On others, the color filled the entire center of the blade, leaving only a narrow border of green along the margin. The color of these central patterns was generally cream or pinkish red (FIGURE 1B).

The final major group of caladiums observed had both spots and a central pattern. The blades of these leaves were quite colorful. In some cases, the central pattern was one color and the spots another (FIGURE 1C). In other instances, the central pattern and the spots were the same color. Another noticeable variation was that of the color of the petiole. Many plants had green petioles, but others had pigmented ones giving them a dark purplish color.

The size of the plants also varied. The average plant had a blade 25–31 cm from the apex of the blade to the distal end of the lobe, although one plant was found to have a blade with a length of 56 cm. This plant stood out in the population.

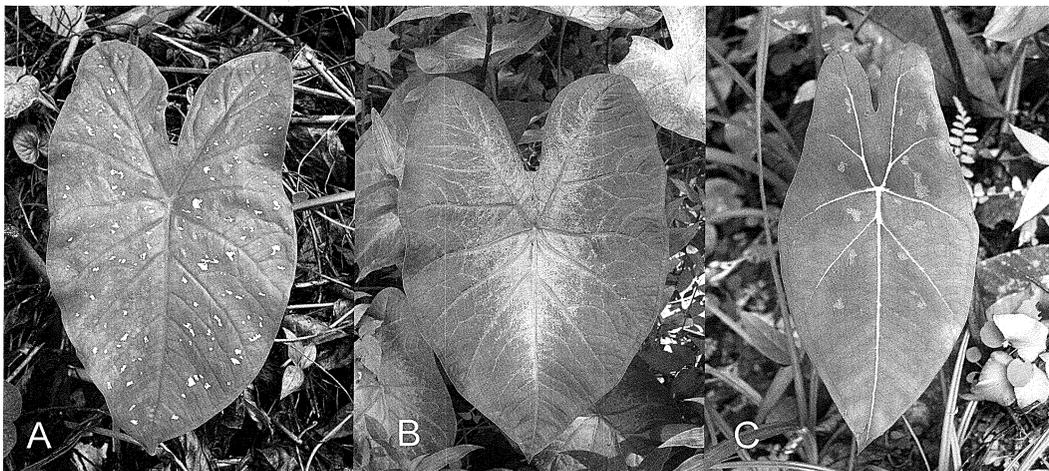


FIGURE 1. Leaf patterns of *Caladium bicolor* growing along the Blanchisseuse Road in Trinidad. A. Red and white spots. B. Pigment in the center of the blade. C. Pigment in the center of the blade with red spots surrounding the pattern.

The populations along the Blanchisseuse Road are phenotypically heterogeneous. Obviously, asexual reproduction played an important role in development of the population, and plants of the same phenotype likely resulted from asexual reproduction. The origin of the heterogeneity, however, is uncertain. Is it the result of sexual reproduction within the population, or is it the result of the movement of asexual propagules from one population to another? Along the Blanchisseuse Road, only two plants were observed flowering. These inflorescences, both in their first day of blooming, were separated by distance and time. It was not evident whether they represented the beginning of the flowering season in the mountains or whether the plants in this region do not flower frequently, thus making sexual reproduction a very rare event. If heterogeneity is the result, at least in part, of the movement of asexual propagules, what form do they take, and how are they moved from one population to another?

Until this study, *Caladium picturatum* was known to occur in only one location near Vega de Oropouche (Boos & Boos 1993) on the east side of the island in the coastal plain. While the expedition was returning from Mt. Aripo, a second population was found near Brasso Seco (Paria Village). A line drawn on a map between the two locations shows Brasso Seco to be ca. 24.5 km from Vega de Oropouche at a direction of 37°NW. The distance measured on the map, however, underestimates the walking distance between these two locations or the distance one must travel using the roads. Much of the topography between these two places is mountainous, and travel between these two areas is not easy.

Distance is not the only character that distinguishes these populations. The *Caladium picturatum* plants at Vega de Oropouche were found growing among bananas in a bright, flat, sandy area. *Caladium bicolor* was found nearby but separate from the *C. picturatum* population. The population near Brasso Seco was growing in moist, yellow clay along the edge of a wide trace (an old donkey trail). The trace cuts through

lower montane rain forest, and the plants were growing in partial shade. No evidence of human habitation was observed in the area, and here, *C. picturatum* was found growing among *C. bicolor*. The two species, even though sympatric, were distinct. No evidence of hybridization or any long-term introgression could be found. The *C. bicolor* was similar to other plants of that species found in the area, and no plants of either species showed an intermediate phenotype that would suggest hybridization.

The distance between the two populations would suggest that other isolated populations exist between Brasso Seco and Vega de Oropouche. Finding these populations, particularly in the North Range, would be a Herculean task requiring much time, energy, and serendipity.

The reproductive biology of caladiums remains open for study, including basic questions regarding the genetics of these plants. Genetic studies conducted on caladiums in the past (Zettler & Abo El-Nil 1979) used the cultivated *Caladium ×hortulanum*. Garden caladiums are the result of hybridization, both interspecific and intraspecific, and are not the best plants to use in genetic research. A study of *C. bicolor* of a particular geographic region should reveal much. Nature has provided the necessary phenotypes to study the patterns of inheritance. The plain green phenotype could be used as one of the parents, which would allow for the determination of dominance of the various patterns found on the blades of the leaves.

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