

Taxonomic Study of *Anthurium* in Central America

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My interest in aroids first developed while doing research on the flora of Barro Colorado Island in Panama beginning in 1967 (Croat, 1978a). The Araceae has proven to be the most difficult family taxonomically, and therefore I spend much time collecting and studying the family. This activity has been expanded to the rest of Panama as well as elsewhere in Central and South America, and serious revisionary work with *Anthurium*, the largest and most complex genus of Araceae, began in 1976.

Anthurium is comprised of some 800 species, many of which are new to science. Initial studies made in Panama and Costa Rica are indicative. Costa Rica has approximately 60 species of *Anthurium* with 15 of them suspected to be new to science. In Panama, where the Araceae flora is both richer and more poorly known, there are over 100 species of *Anthurium*, with as many as 40 species believed to be new to science.

ITINERARY AND METHODS

In order to survey the remainder of Central America and Mexico for *Anthurium*, the National Geographic Society supported an expedition to Mexico and Central America. The expedition began in St. Louis in June 1978. Fieldwork was done in a three-quarter-ton, four-wheel-drive truck equipped with a winch and a specially designed camper, which I built for collecting and drying Araceae. Since Araceae is a family rich in succulent plants difficult to dry, a large, propane-powered, insulated oven was built into the camper to provide a continuous drying operation. The outfit allowed uninterrupted operations, which enabled us to accomplish a great deal more than we could have otherwise with normal collection procedures.

The objective of the expedition was to find as many of the described species of *Anthurium* from Mexico and Central America as possible, to study them in the field, and to make dried and living collections of them for further studies at the Missouri Botanical Garden in St. Louis.



FIGURE 1. Collecting Araceae near Puerto Barrios in Guatemala.

The known type localities of *Anthurium* in Mexico and Central America are quite scattered, but an attempt was made to visit as many as possible in a single trip. Our route carried us down the eastern coast of Mexico. Our first aroid collections were made in the State of Tamaulipas north of Tamazunchale, and as we worked our way down the eastern slope through the band of mesic vegetation where aroids abound we visited Fortín, Córdoba, Orizaba, and Mirador, all important, known collecting localities. At Fortín we rediscovered *A. fortinense* growing high on the limestone cliffs within the forested slopes above a roaring stream. These plants later proved to be the same as *A. schlechtendalii* Kunth. The complete transect of the Mexican and Central American Caribbean slope provided the opportunity to analyze numerous populations of *A. schlechtendalii*, many of which had been described as different species. Like many *Anthurium* species, *A. schlechtendalii* is extremely variable yet broad-ranging. Field studies, like the one conducted during the summer of 1978, provide the opportunity to analyze this variability in a way that equivalent studies with herbarium material could not do. Perhaps the greatest accomplishment of the expedition was to be able to study several



FIGURE 2. Tom Croat pressing plants south of Lago Yojoa, northwest of Tegucigalpa, Honduras, 1978.

confusing taxonomic complexes throughout their range and to collect herbarium and living collections of different populations for later study. Further study of this material has already enabled me to synonymize a number of names of Central American *Anthurium*. Despite the fact that many of the Central American *Anthurium* names have proved to be synonyms of species described earlier, a number of species of *Anthurium* (and other Araceae as well) believed to be new to science were discovered on this trip.

Among the most interesting localities visited in Mexico during the trip were the Serrania de Juárez between Valle Nacional and Oaxaca along route 175, the region around Teapa in Tabasco State, the region between Berriozabal and Presa Netzahualcóyotl, and along the route paral-

leling the Río Usumacinta to Bonampak in the Lacondon Selva in southeastern Chiapas. The last-named region is among the wettest and least disturbed in Mexico. Another important area visited was the route between Mexico Highway 190 and 200 paralleling the border with Guatemala. This road passes through Motozintla and other important collecting areas of Eizi Matuda in southwestern Chiapas in the wet area along the Pacific coast where many Araceae have been described.

The first area visited in Guatemala was the route between Malacatán and San Marcos, including the virgin forest at elevations between 1100 and 1600 m at Finca Armenia. Here I rediscovered a new species of *Syn-gonium* not seen since sterile collections were made by Julian Steyermark more than 20 years ago. Other important collecting localities in Guatemala included the vicinity of Cobán, along the road to Lago Izabal in the Department of Alta Verapaz, the coastal region around Puerto Berrios (Izabal Department), and the region around Volcán de Fuego near Aaltenango southwest of Guatemala City. The latter area is the type locality of *A. salvinae*, an important component in a confusing species complex principally inhabiting the Pacific coast of Central America. The region provided the most exciting incident on the trip. Having left my wife with the vehicle near the base of the volcano, I set out in the direction of the volcano. The trail began through the forest but was continually diverted at an oblique angle and finally emerged at the edge of a huge lava flow about 500 m wide and 30 m deep. Seeing this route as the only approach to the upper levels of the volcanic cone, I climbed down the wall into the lava flow using a fallen tree. Having jumped the last 5 m, the only way out was to go forward. The going proved very difficult and I was ultimately forced to try to scale back out of the flow about a mile ahead. This proved difficult and dangerous, because as I inched my way near the top of the wall the loose banks became more difficult to climb on. Each step had to be carefully calculated as I used my machete to cut more secure footholds in the loose bank. Ultimately I was able to throw myself over the edge onto the safety of a secure grassy bank.

Not all excursions were so fruitless as that one. In El Salvador, while crossing over "El Impossible" between San Fernando Menéndez and Tacuba, we discovered a new species of *Anthurium*. From here we went to Cerro Monte Cristo, a cloud forest on the borders of Honduras, Guatemala, and El Salvador. To enter Honduras we were forced to enter Guatemala and then circle back, owing to the border disputes between Honduras and El Salvador. In Honduras we visited several regions along the Atlantic coast including the Lancetilla Valley forest preserve, where another new species of *Anthurium* was discovered. In Nicaragua we discovered still another new species in the area near Jinotega.

RESULTS

The expedition enabled me to collect in the type localities of more than half the *Anthurium* species of Mexico and Central America. In most cases species of *Anthurium* fitting the description of the plants were discovered. More than 5000 herbarium specimens were collected along with 850 collections of vouchered living Araceae; batches of these were shipped air-freight to St. Louis approximately every week throughout the course of the summer. The dried plants accumulated each day were boxed and living collections were trimmed and washed in a stream before packaging for shipment. Approximately one day a week was spent making arrangements for shipping plants, since each country had slightly different procedures and regulations. The majority of living collections arrived safely, and continuing studies are being made at the Missouri Botanical Garden. The information accumulated on the expedition will go a long way toward providing a complete revision of the genus *Anthurium* for Central America. This work now continues with support from the National Science Foundation.

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