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Expedition to Study Reproductive Biology and Taxonomy of Araceae in Ecuador

by Pedro Díaz Jiménez, Villahermosa, Tabasco, Mexico

In early 2024, my friend Dr. Heiko Hentrich and I planned to travel to Ecuador to continue studying the pollination of *Anthurium oxyphyllum* Sodiro, which Heiko had initiated in 2021. The second objective of our visit was to collect and identify Araceae in an extensive area of cloud forest located in the Parroquia de Lita, in the northwest of the Province of Imbabura.

A few months before we left for the field trip, Heiko informed Dr. Thomas B. Croat about our expedition. Tom kindly provided us with a list of species that he had collected in previous years throughout that region and suggested we contact the biologist Ricardo Zambrano Cevallos (Figure 1), director of the Quito Botanical Garden and Collections, and an expert on the genus *Anthurium* in Ecuador.

Once our trip was confirmed, Heiko informed his friends Patricia Pabón Sáenz and her family about our stay. They kindly prepared accommodations for our arrival. Patricia is the owner of the private botanical garden “Orquideario El Santuario,” located in Santa Rita, Parroquia de Lita.

Finally, on October 27, 2024, we arrived at the Quito airport and were warmly received by Patricia’s brother Eduardo and his wife, Elsa M. Lastra



Figure 1: From left to right: Pedro Díaz Jiménez, Ricardo Zambrano Cevallos, and Heiko Hentrich at the entrance of the Quito Botanical Garden.



Figure 2: From left to right: Jorge I. Pavón Sáenz and Heiko at the bus terminal in Ibarra.

Guamaní, who kindly brought us to our hotel. The next day, we spent the morning at the Pontifical Catholic University of Ecuador, where we were received by Katya Romoleroux, botanist and specialist in the Rosaceae family. There, we met Ricardo and had a look at the Araceae collection in the herbarium.

Afterwards, we drove together to the Quito Botanical Garden, where we marveled at the fantastic plant collection. Ricardo invited us to an Ecuadorian lunch in the garden. We enjoyed the relaxed atmosphere and talked about the possibility of a joint scientific project during our stay. Ricardo kindly agreed to collaborate and provided us with equipment for field collection.

The next morning, we set off on our journey to Santa Rita. Eduardo drove us to the Carcelén bus terminal in the north of Quito, from where we

traveled to Ibarra, the local capital of the Ibarra Canton. Having barely arrived, we were welcomed by Patricia's daughter Leslie, her boyfriend Dario, and Patricia's brother Jorge (**Figure 2**) and his daughter Danna. They invited us for lunch in a *chifa* (a kind of Chinese cuisine) and accompanied us to the next bus that would take us to Santa Rita.

That same afternoon, we arrived in Santa Rita and were cordially welcomed by Patricia, her husband Germán Gómez Lara, and her sons, Dorian and Boris (**Figure 3**).

During the first week in Santa Rita, we focused on continuing Heiko's studies on the pollination of *Anthurium oxyphyllum*. On the morning of October 30, we went to the study site where many individuals of that species grow (**Figure 4**). First, we checked the flowering condition of the plants, and then began preparing the different pollination experiments we planned to conduct over the following days (**Figure 5**). The results of our experiments were quite surprising and revealing and will be published next year.



Figure 3: From left to right: Germán Gómez Lara, Patricia Pabón Sáenz, Boris S. Gómez Pabón, Leslie N. Gómez Pabón, Dorian Gómez Pabón, Heiko and Pedro at the "Orquideario El Santuario".



Figure 4: *Anthurium oxyphyllum* growing in Santa Rita.



Figure 5: Pedro preparing the camera.

On the afternoon of November 4th, we headed with Germán and Boris to the community of La Esperanza de Río Verde to pursue the second aim of our stay: the collection of Araceae in a very species-rich and poorly explored area (**Figure 6**). The region of La Esperanza has witnessed severe deforestation in recent years. Much pressure is exerted on the remaining fragments of primary cloud forest, principally by international mining companies in search of rare metals, but also by the local population seeking new grounds for cattle grazing or crop cultivation.



Figure 6: View of the cloud forest in the background, where we collected Araceae. The area is extremely threatened by deforestation for the cultivation of crops and grazing cattle, but especially by mining for rare metals by international mining companies.



Figure 7: On our way on a muddy trail to the cabin with Germán in the background.



Figure 8: The team that joined us on our field trip - from left to right: Boris, Germán, Ana M. Pabón Sáenz, Heiko, and Dorian in La Esperanza de Río Verde.



Figure 9: Impression of the very species rich, Araceae-dominated cloud forest at the finca.

We traveled for about 20 minutes in a pickup truck until reaching the end of the road. Then we walked for about an hour on a muddy trail (**Figure 7**), crossing a large river until we reached a cabin on a farm belonging to the Pabón family, where Dorian and Patricia's sister Ana Magdalena were waiting for us (**Figure 8**).

The next morning, Germán guided us on a steep hike into the mountains, where we began exploring the area and conducting the first pollination experiments at that site. The forest was truly amazing! Araceae were the dominant herbaceous plants in this area (**Figure 9**). I had never been in a place with so many *Anthurium* species growing together. The high diversity was stunning—and of course, there were many other aroids thriving in that area as well.



Figure 10: *Anthurium argyrostachyum* growing in cloud forest at the finca.



Figure 11: *Anthurium lancea* growing in cloud forest at the finca.



Figure 12: *Anthurium membranaceum* growing in cloud forest at the finca.



Figure 13: *Anthurium panduriforme* growing in cloud forest at the finca.



Figure 14: *Anthurium pulverulentum* growing in cloud forest at the finca.



Figure 15: *Anthurium esmeraldense* growing in cloud forest at the finca.

On our first day in the cloud forest, we collected a few species, many of them locally very abundant, such as *A. argyrostachyum* Sodiro (**Figure 10**), *A. lancea* Sodiro (**Figure 11**), *A. membranaceum* Sodiro (**Figure 12**), *A. panduriforme* Schott (**Figure 13**), and *A. pulverulentum* Sodiro (**Figure 14**). We also collected some apparently less abundant species, such as *A. esmeraldense* Sodiro (**Figure 15**) and *Anthurium* aff. *granulinervium* Croat (**Figure 16**).

The next day, we processed all the material (**Figure 17**) and continued with the pollination experiments in the forest. On our last day at the finca, the plan was to set off from the cabin in the late afternoon and arrive in Santa Rita before nightfall. Since we still wanted to collect some more plants, we had to get up early. Germán joined us again and helped bring down and carry the plants.



Figure 16: Left to right: Heiko, Germán & Pedro in front of a giant *Anthurium* aff. *granulinervium* in cloud forest at the finca.



Figure 17: Pedro at the cabin of the finca during the documentation, measurement and preparation of herbarium specimens.



Figure 18: *Anthurium cuspidatum* growing in cloud forest at the finca.

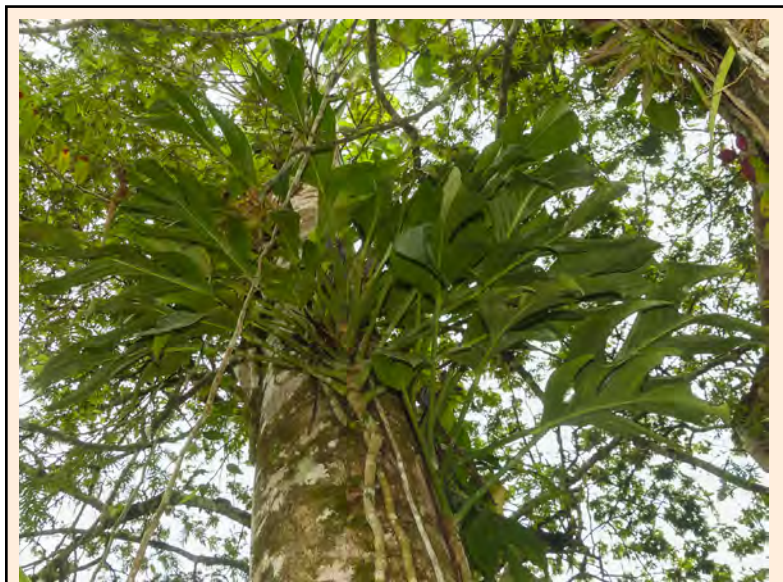


Figure 19: *Monstera pinnatifidata* growing in Santa Rita.

We collected *A. cuspidatum* Mast. (**Figure 18**), as well as several species of *Anthurium* sect. *Calomystrium*, two *Anthurium* sect. *Tetraspermium* (Schott) Engl., and species of *Chlorospatha*, *Monstera*, and *Stenospermatum*—all still undetermined. Anita, Germán, Boris, and Dorian helped carry the plants and our scientific equipment along the trail, and we returned safely to Santa Rita that night.



Figure 20: From left to right: Ricardo and Pedro arranging the collected specimens in the Quito Botanical Garden.

During our last days in Santa Rita, we continued the pollination experiments and completed the preparation of herbarium specimens from the plants collected at La Esperanza. The surroundings of Santa Rita were no less interesting for Araceae than the cloud forest. We made the most of our time and documented the local flora, collecting *M. pinnatifidata* Schott (**Figure 19**), along with other species of *Monstera* and a species of *Syngonium*, still undetermined.

Finally, on the morning of November 11th, we said goodbye to our friends in Santa Rita and boarded the first bus to Ibarra. Upon arrival at the terminal, Jorge was waiting for us to say farewell and kindly gave us some gifts. A few minutes later, we continued our journey to Quito and took a taxi directly to the Quito Botanical Garden, where Ricardo was expecting us to arrange the specimens and place them in the dryer (**Figure 20**).

On my penultimate day in Ecuador, we visited the National Herbarium of Ecuador in the morning and were warmly welcomed by Collections Administrator Marcia Peñafiel Cevallos, who gave us directions on how to review the Araceae collection. In the afternoon, we met for a drink with Ricardo to say goodbye, have dinner, and plan our next visit to Ecuador.

On the morning of November 13th, we went to the historic center of Quito to admire its many beautiful historical buildings. While I returned to Mexico in the afternoon, Heiko stayed for one more night and gave talks on Araceae pollination to biology students at the Pontifical Catholic University of Ecuador and to gardeners and researchers at the Quito Botanical Garden (Figure 21). Finally, on the evening of November 14th, Heiko traveled back to Germany.

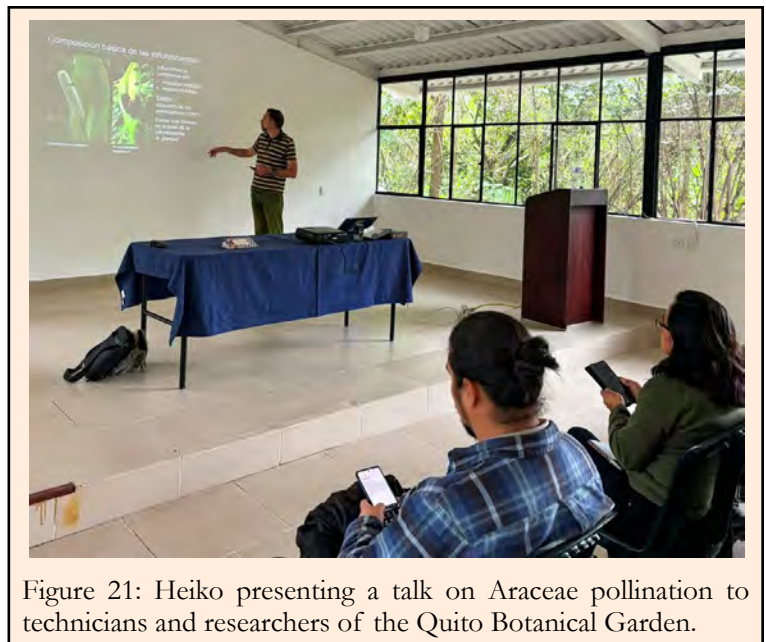


Figure 21: Heiko presenting a talk on Araceae pollination to technicians and researchers of the Quito Botanical Garden.

Some Small to Medium-Sized Multilobed *Anthurium* of the Guianas

by Joep Moonen 973ejv@gmail.com

INTRODUCTION

In the endless rainforests and other natural areas of the Guianas, we find several multilobed *Anthurium*. Most of them are easy to overlook, as their leaf lobes blend seamlessly with the surrounding vegetation. However, when cultivated in pots, their beautifully shaped leaves stand out without the interference of nearby plants. Interestingly, the four species highlighted in this article each occupy a very specific habitat.

1. *Anthurium pentaphyllum* (Aubl.) G. Don

This attractive, relatively small species is found in the northeastern corner of Venezuela (Gulf of Paria), the three Guianas, and the State of Amapá, Brazil. It thrives in harsh conditions on and near the rocks of the Atlantic coast. These plants are highly resistant to full sun, salty sea breezes, and poor or rocky soils. Along the coastline, where the environment is more forgiving, the plants develop fuller, often five-lobed leaves. In some coastal areas, *Anthurium pentaphyllum* is quite common. I planted specimens from the coast in the 1990s at the edge of our rainforest, and they continue to thrive, climbing on small trees.

In the forests of the interior, we occasionally encounter small multilobed *Anthurium* that likely belong to this species, although such occurrences are rare and involve individual plants.

2. *Anthurium sinuatum* Benth. ex Schott

This rare species is found in the three Guianas and the State of Amapá, Brazil. I have observed it only on the edges of transitional forests near inselbergs in the interior. The plants blend seamlessly into the surrounding vegetation, making them difficult to spot. Occasionally, an inflorescence reveals the presence of a small *Anthurium* clinging to a tree trunk. *Anthurium sinuatum* resembles a young *Anthurium clavigerum*.

Some plants in the wild have been known to me for over 20 years. Cultivating them, however, is challenging. In our forest garden, they take a long time to establish, sometimes requiring over a year to produce a new leaf or root, similar to larger multilobed species like *Anthurium eminens*.

3. *Anthurium clavigerum* Poepp. & Endl.

This species is perhaps the most well-known and cultivated among multilobed *Anthurium*s, thanks to its beautifully shaped leaves. It ranges widely, from Central America to Brazil, Bolivia, Venezuela, and the three Guianas. However, in French Guiana, I have only encountered it in Saul, in the center of the region. There, it grows in trees within primary high forests.

In my experience, *Anthurium clavigerum* is easier to cultivate than the first two species. Its mature leaves are particularly striking.

4. *Anthurium* spec. (coll. nr. JM1238)

I discovered this small *Anthurium* in 2022 in the Kaw Mountains, an area known for its high biodiversity. It grows on thin branches along overgrown trails at an altitude of 300 meters (900 feet) in very humid low forests on laterite rocks.

This *Anthurium* resembles *A. pentaphyllum* but is much smaller, with slimmer leaves. It could potentially be a subspecies of *A. pentaphyllum*. Mature plants reach only 5-10 cm (2-4 inches) in height, and their whitish inflorescences are extremely small.

I am preparing herbarium specimens for Dr. Croat at the Missouri Botanical Garden to determine if this is a known species or subspecies. Thus far, I have found no reference to a similar plant in the literature.

ACKNOWLEDGMENTS

I extend my gratitude to Dr. Thomas Croat for studying and describing the aroid material sent from French Guiana since the early 1990s.

LITERATURE

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- 1990: *Neotropical Rainforest Animals* – Louise Emmons / François Feer
- 1997: *Checklist of the Plants of the Guianas* – J. Boggan et al. – University of Guyana



Figure 1: *Anthurium pentaphyllum* growing among low vegetation on the rocky coast near Cayenne, the capital of French Guiana.



Figure 2: *Anthurium pentaphyllum* plants clinging to a small tree.



Figure 3: Leaves of *Anthurium pentaphyllum* blending with those of surrounding plants.



Figure 4: Leaves of *Anthurium pentaphyllum* growing in the shade develop wider lobes to capture more light.



Figure 5: Spadix of *Anthurium pentaphyllum* in its natural habitat.



Figure 6: Developing fruits of *Anthurium pentaphyllum*.



Figure 7: To locate the rare *Anthurium sinuatum*, one must explore granite outcrops and inselbergs in the interior, likw the transitional forest seen behind the helicopter.



Figure 8: *Anthurium sinuatum* clinging to a small tree near a granite outcrop.



Figure 9: Leaves of *Anthurium sinuatum* emerging from the forest edge.



Figure 11: *Anthurium clavigerum* hidden within the deep forests of southern French Guiana.



Figure 10: Pendant inflorescence of *Anthurium sinuatum* in the wild.



Figure 12: *Anthurium clavigerum* along the Aroid Trail.



Figure 13: *Anthurium clavigerum* growing at the base of a giant tree near Saul, French Guiana. (Photo by Tony Pinto)



Figure 14: A new leaf of *Anthurium clavigerum* unfurling.



Figure 15: A fresh *Anthurium clavigerum* leaf.



Figure 17: The humid Kaw Mountains, home to *Anthurium* spec. JM1238.



Figure 16: Ripe fruits of *Anthurium clavigerum*.



Figure 18: The colorful poison-arrow frog *Dendrobates tinctorius* from the Kaw Mountains.



Figure 19: *Anthurium* spec. JM1238 growing on thin trees in rocky soil.



Figure 20: Slim leaves of *Anthurium* spec. JM1238.

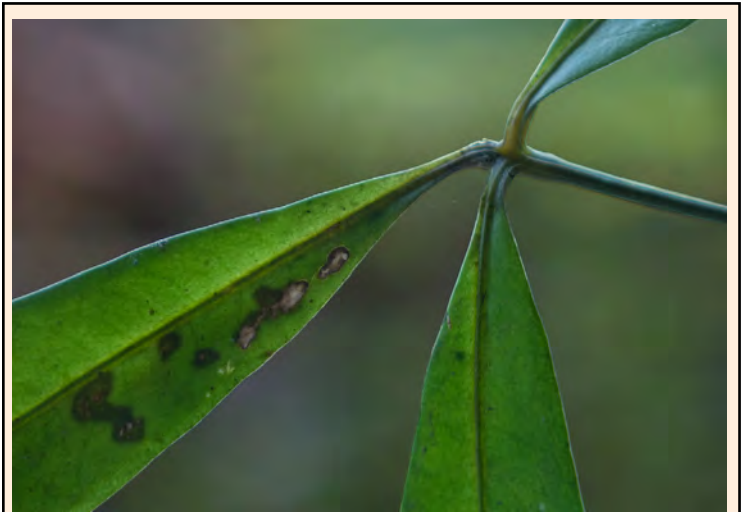


Figure 21: Close-up of an *Anthurium* spec. JM1238 leaf.



Figure 22: The tiny flower of *Anthurium* spec. JM1238.



The Importance of Plant Tissue Culture in the Araceae Family: A Path to Conservation and Economic Growth

by Evan Courtright

Aroids such as *Anthurium*, *Philodendron*, and *Alocasia* have surged in popularity among plant enthusiasts, collectors, and commercial growers. However, growing demand and environmental pressures call for sustainable propagation methods to ensure their long-term survival. One of the most innovative techniques in modern botany—plant tissue culture—plays a crucial role in both conservation and the economic sustainability of aroids worldwide.

The Process of Plant Tissue Culture

Tissue culture begins by selecting a plant for initiation, known as the “explant.” Typically, this is the youngest, most vigorous growth, such as meristematic tissue, which is naturally cleaner and more robust.

- 1. Sterilization:** The explant undergoes surface sterilization to remove contaminants. Depending on the species, this may involve a 70% ethanol solution, or a sodium hypochlorite mix with a surfactant like Tween-20. The explant is rinsed multiple times in the solution, followed by washes with purified water.
- 2. Media Preparation:** The explant is placed in a nutrient-rich medium, typically Murashige and Skoog (MS) media, supplemented with sucrose, agar, and plant growth regulators (cytokinins and auxins). The medium is pH-balanced (5.7–5.8) and autoclaved for sterilization.
- 3. Cultivation in Sterile Conditions:** In a laminar flow hood, the explant is transferred to the medium in a sterile environment to prevent contamination. Cleanliness and aseptic technique are critical for maintaining healthy tissue cultures.
- 4. Subculturing:** Once the explant grows successfully without contamination, it is transferred to fresh media every 4–8 weeks, depending on the cultivar. Each subculture cycle can exponentially increase the plant population. Media formulations may be adjusted to optimize growth, elongation, or rooting.
- 5. Acclimation:** Once a stable population is reached, select plants are transitioned to soil. This process gradually lowers humidity from nearly 100% in culture vessels to 60–70%, allowing plants to adapt to typical growing conditions. We prefer substrates made of coir, peat, and biochar, but other options like perlite and sphagnum moss work as well. Over 2–4 weeks, humidity is reduced, roots colonize the substrate, and plants are prepared for final transplanting.

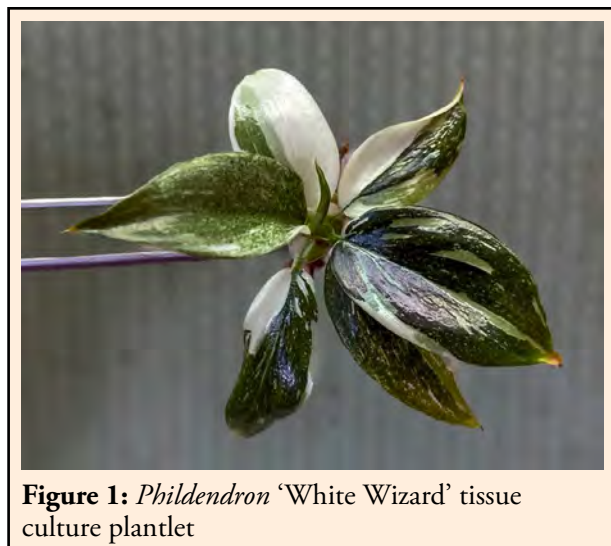


Figure 1: *Philodendron* ‘White Wizard’ tissue culture plantlet

This method enables large-scale propagation of aroid species with genetic uniformity, improved growth rates, and disease-free production.

Conservation Through Tissue Culture

Many species in the Araceae family face threats from habitat loss, climate change, and overharvesting. Traditional propagation methods often fail to preserve genetic diversity or meet conservation needs at scale. Tissue culture, however, allows for mass production of genetically identical, disease-free plants in a controlled environment.

Techniques such as micropropagation and bioreactor cultivation enable rapid multiplication of rare and endangered aroids. This ensures species at risk of extinction can be reintroduced into their natural habitats or safeguarded in botanical collections. Tissue culture is also invaluable for *ex situ* conservation, preserving genetic material for future restoration efforts.

A prime example is *Philodendron spiritus-sancti*, once critically endangered and accessible only to collectors. Just a few years ago, mature specimens commanded thousands of dollars. Through tissue culture, this plant is now commercially available worldwide at a fraction of its previous cost, demonstrating the potential of this technique for conservation and accessibility.

Economic Impact and Commercial Benefits

The global ornamental plant market has seen an explosion in demand for exotic and rare aroids. Tissue culture meets this demand by enabling large-scale, consistent, and high-quality production. Unlike traditional propagation methods, which may take years, tissue culture accelerates growth and yields thousands of uniform plants efficiently.

Moreover, tissue culture reduces the risk of disease transmission—a major concern in commercial production. Plants grown in culture are typically pathogen-free, minimizing crop loss and ensuring healthier plants for consumers. This reliability enhances profitability while reducing the need for wild collection, supporting sustainable horticultural practices.

Today, the vast majority of aroids available at retailers originate from tissue culture labs. However, with thousands of species in the Araceae family, only a few dozen are commercially available. Raising awareness and investing in conservation efforts for lesser-known species with striking attributes is crucial to restoring their populations.

Future Perspectives

As plant tissue culture technology advances, new opportunities for conservation and commercial production continue to emerge. Innovations in somatic embryogenesis, cryopreservation, and genetic improvement will further protect endangered species while enhancing plant quality for the market.

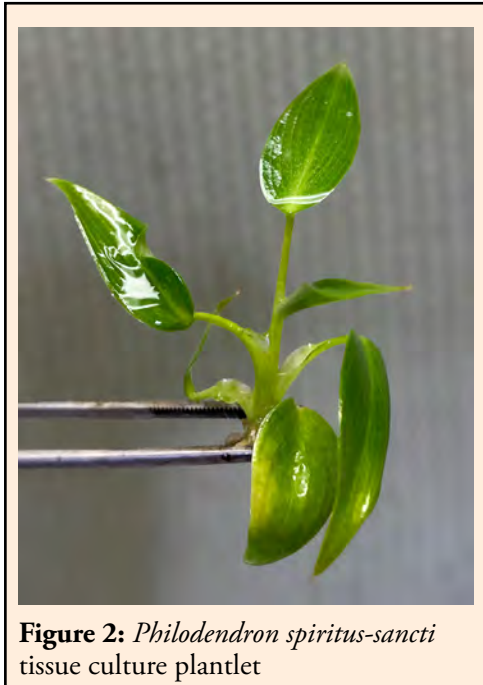


Figure 2: *Philodendron spiritus-sancti* tissue culture plantlet

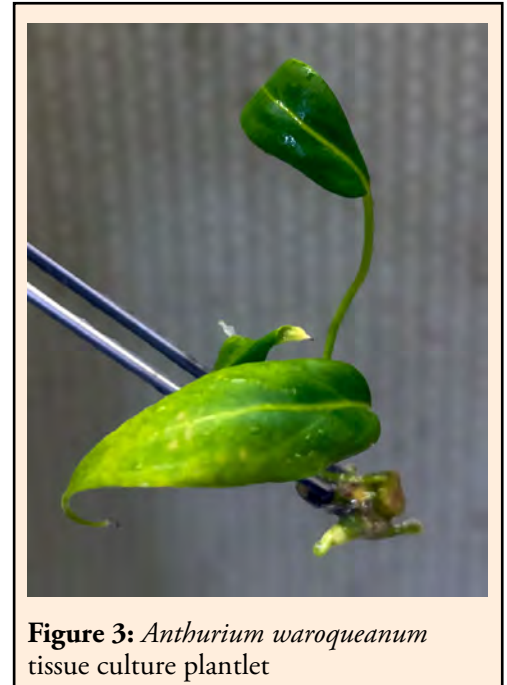
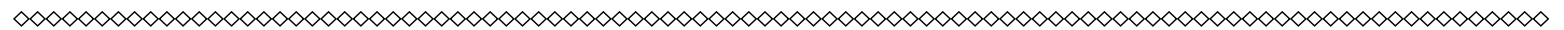


Figure 3: *Anthurium waroqueanum* tissue culture plantlet

The International Aroid Society plays a critical role in promoting awareness and research on Araceae, encouraging conservation and responsible commercial production. By embracing tissue culture, we can support these efforts and ensure a sustainable future for aroids—balancing ecological responsibility with economic opportunity.

For those interested in supporting tissue culture initiatives or suggesting plants for future projects, please contact us at evan@theregularplantco.com. We would love to hear about the species you'd like to see in tissue culture!



The Passing of Aroiders I Have Known

by Thomas B. Croat, P.A. Schulze Curator of Botany, Missouri Botanical Garden

I lead a very busy life and often don't keep track of day-to-day events, sometimes reading my magazines months, even years, after they arrive. In doing this, I am sometimes surprised to learn of the passing of some famous person long after they are gone. But it is often true that I only learn of the passing of some of my friends in a similar way.

This has happened to me several times in the past couple of years, where I have learned of important plantsmen — even important aroiders — passing, apparently unnoticed. Here, I am intending at least to give the details of their deaths for the record, so that the remainder of our small group can at least read of their accomplishments.

David Leedy

I learned only recently that my old friend and fellow Aroider, David Leedy, had died on July 12, 2017. I was shocked to learn this by running across a Facebook message that mentioned his birthday but also indicated that he had passed several years ago.

I first met David many years ago when I visited him in his very wonderful home in the suburbs of Los Angeles, California, in the exclusive Benedict Canyon neighborhood. He mentioned that he lived only a few minutes away from the infamous Tate murders, where the crazed cult leader Charles Manson and his followers killed actress Sharon Tate — wife of movie director Roman Polanski — and some of her friends on August 8–9, 1969.

David had just built a huge greenhouse, semi-attached to his house, and had it partially full of aroids. At the time, David was involved with making movies, acting as a business agent for some producers, and he drove a big fancy car. I jokingly referred to him as a “movie mogul.”

Years later, he moved to the western suburbs of Ft. Worth, Texas, and became very involved with growing the genus *Arum*. I last visited him when I gave a lecture at the Ft. Worth Botanical Garden during a visit to the Texas Research Institute in 2007.

David’s involvement with the IAS was serious, and for a time, he acted as the producer of the society’s Newsletter. In addition, he published in *Aroideana*, first with an article on the Los Angeles Spring Plant and Flower Show (*Aroideana* 6: 53–54, 1983), and later he published the treatment of *Alocasia* in the *European Garden Flora* (co-authored by T. Croat & P.F. Yeo) through Cambridge University Press in 1984. This latter work was later reprinted in David Burnett’s *The Cultivated Alocasia* in *Aroideana* (Volume 7, No. 3 and 4, 1984a).

David is survived by his wife, Dianne Leedy, and their daughter [name unknown].

Conrad Fleming

Conrad was a well-traveled plant collector from St. Croix in the Virgin Islands. While he was very catholic in his interests, he concentrated on aroids from his native West Indies and traveled to several islands, including Jamaica and Martinique.

He lived with his aged parents adjacent to the St. Croix Botanical Garden and helped them operate a bottling plant for soft drinks. He often traveled wearing an “Orange Crush” tee shirt. Later in his career, after the family business was closed, he worked full time for the local oil refinery.

Since he frequently could not take time off to go to the field, he often offered cash incentives to people who would collect for him and share what they found.

While the West Indies has been botanized since the 17th century and one would not expect to find many new species, Conrad managed anyway—discovering a new *Anthurium* (*A. flemingii* Croat, a species in sect. *Episeiostenium* to be published in an upcoming revision of that section) in the mountains of Jamaica.

Owing to the fact that the island of St. Croix is usually very dry, Conrad grew most of his plants in massive plastic tanks partially filled with water.



Figure 1: David Leedy at BRIT Lecture, 2007

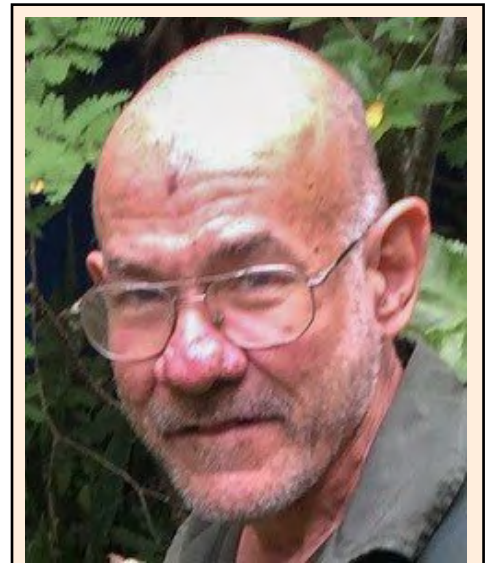


Figure 2: Conrad Fleming

For several years since the beginning of the COVID pandemic, I tried to make contact with Conrad a variety of times, and even resorted to contacting others who might know him. But it was not until I saw a birthday announcement on the ever-present Facebook birthday messaging site—with a comment, “Happy Birthday in heaven”—that I realized my fears were correct: he had, like so many others, succumbed to that horrible disease.

While Conrad could sometimes be a problem—arriving, as he often did, with the gift of a well-grown *Anthurium cordatum* (the only native *Anthurium* on his island), while asking for cuttings of every plant you had—he was a fun guy to be with, and he was very serious about his love of aroids.

Jiří R. (George) Haager

Jiří Haager (1943–2022), often going by the anglicized version George, died on September 15, 2022. While perhaps not well known in aroid circles, he must be remembered for his important discoveries in Araceae and in other families.

He was the founder and Director of the Prague Botanical Garden, and a recognized expert on botany and author of almost two dozen popularized books.

He studied biology at Charles University, worked at the Vysočiny Museum in Jihlava, then spent 14 years as executive editor of the magazine *Živa*. With the company Sady a lesy města Prahy, he devoted himself to the innovation of indoor flowering plant assortments and founded a gene pool collection of tropical plants in the Botanical Institute of the Academy of Sciences.



Figure 3: George & Lida Haager, Czech Republic

Since 1994, he was the Director of the Prague Botanical Garden. He was a member of several scientific societies and participated in a number of scientific expeditions to Latin America and Southeast Asia. From 2002 to November 2019, he worked as the director of the Teplice Botanical Garden, which he formed from the ground up, making it one of the finest gardens in the Czech Republic. His dedicated and respectable botanical work survives in every corner of both institutions.

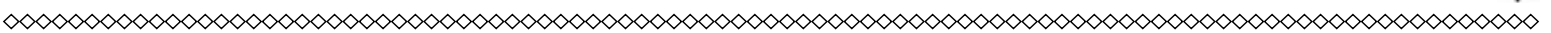
I first met George Haager almost by accident during a trip to Eastern Europe following the International Botanical Congress in Leningrad in 1975. While I was working in the herbarium — then housed in an old castle that had been the property of a former king — I was told that someone had called to talk to me. Since no one except my wife knew where I was working, I was shocked.

It was Haager, telling me that he had a collection of aroids and wanted to know if I would like to see them. Thinking it a bit absurd that a country closed off from the West for nearly 50 years would have anything of interest, I agreed — but did not expect to see much.

Instead, I was led into a dilapidated greenhouse filled with tropical plants from Venezuela, Mexico, and Colombia. George had had the good fortune to be taken along on several expeditions led by Czech volcanologists, who were famous for their ability to predict volcanic eruptions and thus in high demand. George simply spent his time collecting living plants and bringing them back to Europe.

One of the first plants I saw was a new species of *Anthurium* in sect. *Pachyneurium*. Since my revision had not yet been published, we were able to get this new species, *Anthurium sarukhianum* Croat & Haager, into my revision.

I wonder sometimes how many more good aroiders I have known who have also gone, these great plantsmen unrecorded. May their work—and their lives—be remembered in the annals of the plant world.



IAS Awards and Grants Committee

Research and Conservation Grants Awarded for 2025

by Ron Kaufmann, Chair IAS Awards & Grants Committee

In October, the IAS Awards and Grants Committee invited applications for our annual Research and Conservation Grants. As stated in our announcement, we seek to support efforts that:

1. Study aroid biology, ecology, and conservation;
2. Protect aroids and aroid habitats;
3. Educate the public about aroid biology, ecology, and conservation, and encourage public engagement in aroid study and protection.

This year, we received 22 applications: 12 for projects based in Asia, 6 from South and Central America, 3 from the United States, and 1 from Europe. After considerable discussion and deliberation, the committee recommended the following three projects for funding in 2025:

1. Phylogenomics of “Orphan Groups”: Understanding the Evolutionary History of *Chlorospatha* and *Xanthosoma*

Mónica Carlsen, PhD, Missouri Botanical Garden

Two-year project: \$4,634 in 2025; \$5,000 in 2026

2. Alocasia of the Meratus Mountains: Diversity, Ecology, Distribution, and Threat Issues

Zainudin Basriansyah Akar, Yayasan Tumbuhan Asli Nusantara Foundation

One-year project: \$2,500 in 2025

3. The Diversity and Distribution of Aroids (Araceae) in Mt. Makiling, Philippines

Phil Anthony Sumabat, University of the Philippines Los Baños

One-year project: \$5,275 in 2025

Executive summaries submitted by the principal investigators of each funded project are presented below.

Phylogenomics of “Orphan Groups”: Understanding the Evolutionary History of *Chlorospatha* and *Xanthosoma*

Mónica Carlsen, PhD

The tribe Caladieae, within the subfamily Aroideae, remains poorly understood. Recent molecular work has united Caladieae with the tribe Zomicarpeae, expanding the group to include 11 genera and 346 species. Yet, the relationships among these genera remain unresolved, with generic boundaries often unclear.

Many of the included genera are under-studied—true “orphan groups” within the Araceae—making a deeper understanding of their evolutionary history all the more important. Two prime examples are *Xanthosoma* (198 species) and *Chlorospatha* (70 species), the largest genera in Caladieae.

Previous phylogenetic studies have suggested that *Chlorospatha* may be a sister group to *Xanthosoma*, but support for this relationship has been weak. Preliminary data now indicate that some *Chlorospatha* species may actually be nested within *Xanthosoma*, further complicating their taxonomy.

This project aims to investigate the evolutionary history of these two genera, testing whether they are truly monophyletic and whether current infrageneric classifications reflect natural evolutionary lineages. We will also examine their historical biogeography to better understand how these groups have diversified and dispersed over time.

For the first time in these genera, we will apply next-generation targeted sequencing techniques to analyze hundreds of nuclear genes, providing a robust phylogenomic framework. These findings will also have conservation implications, as understanding evolutionary relationships can help identify unique and vulnerable lineages.

Alocasia of the Meratus Mountains: Diversity, Ecology, Distribution, and Threat Issues

Zainudin Basriansyah Akar

This project focuses on the genus *Alocasia* in the Meratus Mountains of Kalimantan, Borneo—a highly isolated and underexplored region, especially in terms of aroid diversity. The area’s ancient karst and ophiolite geology creates unique ecological conditions that foster high levels of endemism.

Despite this, there has been little botanical exploration in the Meratus Mountains. In recent years, several *Alocasia* species from South Kalimantan—such as *A. robusta* and *A. longiloba*—have gained popularity in domestic and international plant markets. Many unidentified specimens have also appeared for sale, particularly on platforms like Facebook.

This unregulated trade, combined with habitat destruction and forest conversion, threatens these plants. The lack of scientific data further complicates conservation efforts.

This study aims to document and map *Alocasia* species in the Meratus Mountains, collecting ecological data to lay the groundwork for effective conservation strategies and protect these unique and vulnerable taxa.

The Diversity and Distribution of Aroids (Araceae) in Mt. Makiling, Philippines

Phil Anthony Sumabat

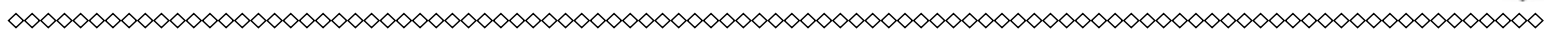
This research investigates the diversity and distribution of aroids on Mt. Makiling, a recognized biodiversity hotspot in the Philippines. Particular attention will be given to the genetic diversity of *Amorphophallus longispathaceus*, a species with promising potential.

Despite its rich flora, Mt. Makiling remains poorly studied in terms of aroids. The Philippines itself has been identified as a “dark spot” in plant diversity research—regions rich in biodiversity but lacking in documentation and scientific study.

Using a stratified sampling approach along elevation gradients and the transect-quadrat method, we will assess species diversity and environmental influences. Fieldwork will include specimen collection and taxonomic identification, culminating in a comprehensive catalog of Mt. Makiling’s aroid flora.

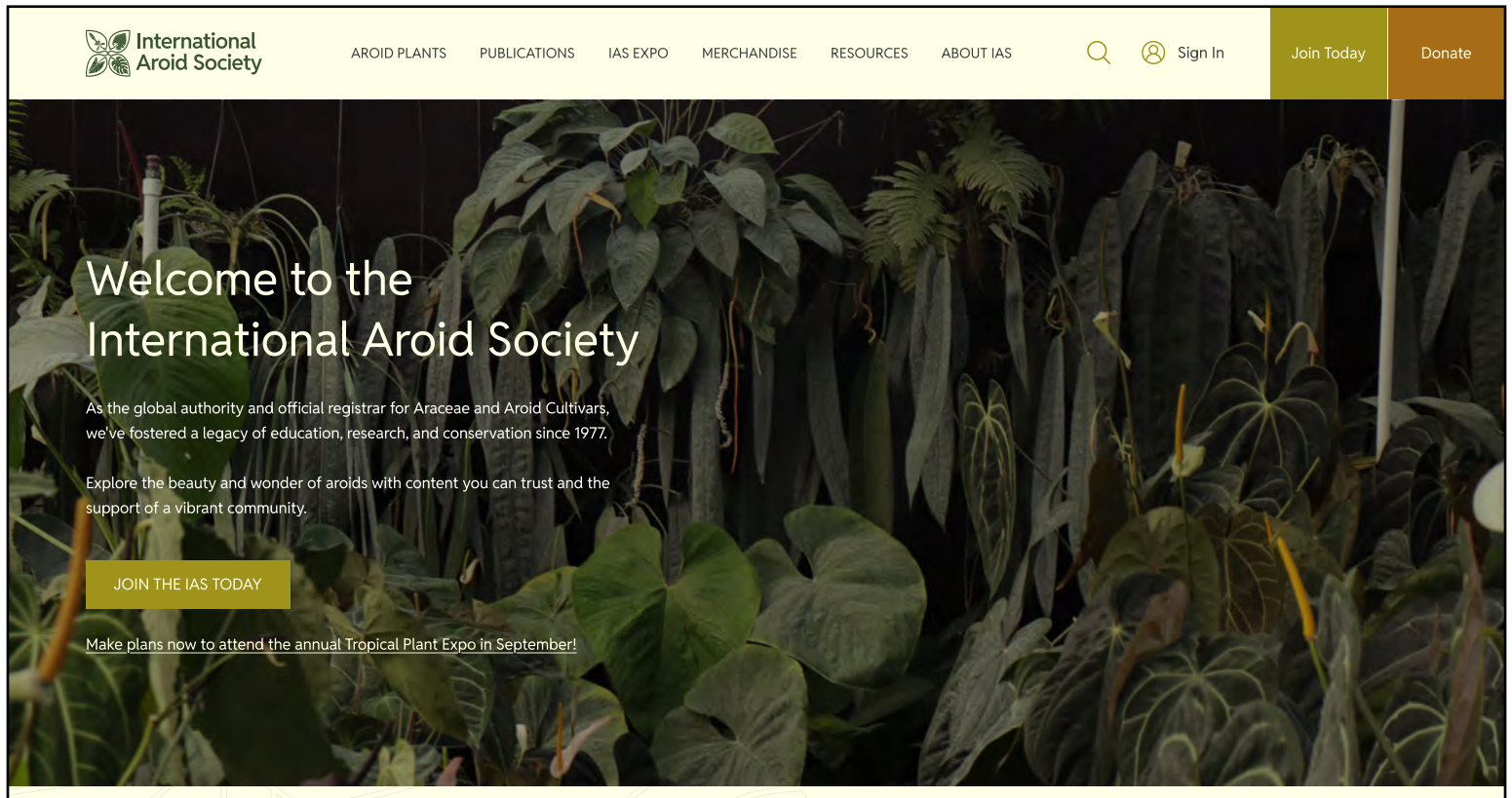
We will also use SSR (simple sequence repeat) markers to evaluate genetic diversity and population structure in *A. longispathaceus*. Statistical analyses—including cluster analysis, ordination, and multiple regression—will help determine how climatic and soil factors shape aroid diversity.

The study’s findings will support conservation planning and contribute to broader goals such as the UN Sustainable Development Goals on Zero Hunger, Responsible Consumption, Climate Action, and Life on Land. The project also lays a foundation for sustainable use of *A. longispathaceus*, with potential applications in varietal improvement and food security.



All-New Aroid.org Website — Launching April 2025!

We are thrilled to announce the upcoming launch of the International Aroid Society's completely redesigned website! Built with our members and community in mind, this modern, user-friendly platform will greatly enhance navigation, improve ease of access to information, and provide a seamless, engaging experience. Additionally, our transition to a robust cloud-based system will ensure increased stability and eliminate site outages.



Enhancements for Members

Among the exciting upgrades is our revamped [Member Portal](#), featuring rolling membership expiration — meaning your membership will now expire a year from the date of purchase, rather than expiring annually on December 31. Throughout the year, we'll continue expanding this space with valuable resources, building an extensive member library curated by the IAS Education Committee.

Expo Website Integration

With this initial rollout, we are seamlessly integrating the current Expo website, iastropicalplantexpo.com, along with the majority of content from aroid.org and exciting new updates — creating a one-stop destination for both Society and Expo-related resources! Our valued [vendors and sponsors](#) will benefit from a streamlined Vendor & Sponsor Portal, simplifying booth selection, contracting, add-ons, and access to key Expo resources — all in one convenient place.

Aroid Cultivar Registry & Future Development

Our commitment to expanding IAS resources doesn't stop there! Throughout the rest of the year, we will continue enhancing the website with additional pages and features, including the integration of the Aroid Cultivar Registry (aroidcultivars.org). These updates will ensure that aroid.org serves as a hub for all things aroid — offering public access to valuable information and educational materials while also providing exclusive member resources!

Partnership With Sterling Talon

To bring this ambitious project together, IAS has partnered with [Sterling Talon](#), a digital marketing agency specializing in non-profits. In collaboration with our Website and Marketing Committees, Sterling Talon has developed a comprehensive digital strategy focused on expanding access to valuable resources and information, enhancing member value, driving impactful fundraising, and ensuring an engaging and successful Expo experience, along with much more.

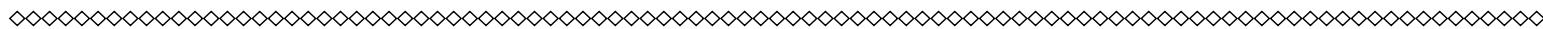
Stay Connected for Updates!

We can't wait to share the all-new aroid.org — your ultimate hub for all things aroid! Stay tuned for more updates by following us on [Instagram](#) and [Facebook](#)!

Thank you for your continued support as we grow and evolve to better serve our vibrant Aroid community!

Brooke Lopeman

Website Committee Chair / Board of Directors



IAS Annual Tropical Plant Expo

September 20–21, 2025 | Miami, Florida

The International Aroid Society is pleased to announce the return of the Annual Tropical Plant Expo, taking place September 20–21, 2025, at the Miami-Dade County Fair & Expo Center in Miami, Florida. This two-day event serves as the premier gathering for aroid and tropical plant collectors, growers, researchers, horticulturists, and industry professionals, and will once again offer an exciting opportunity for plant-related businesses and organizations to engage with a highly targeted and enthusiastic audience.

Call for 2025 Vendors and Sponsors

Vendor and sponsor interest forms are now open for businesses interested in participating in the Expo. Sponsors and exhibitors will gain valuable exposure through a range of marketing and promotional platforms offered by IAS, including web, print, and social media.



Vendor and sponsor spots sold out last year, so early interest is strongly encouraged! Complete the interest form today to be among the first notified when registration opens following the launch of the all-new IAS website.

[**Click Here to Join the Vendor & Sponsor Interest List**](#)

Sponsor Opportunities

All sponsors receive a listing on the IAS Expo page with a company logo, website and social media links, exposure through IAS social media channels, and placement on event signage and promotional materials, including the official Expo T-shirt. Sponsors are also recognized in the August edition of the IAS Newsletter. **Highlighted below are additional key benefits for each sponsorship level; other package-specific benefits are also included and will be shared with interested sponsors.**

Platinum – \$7,000

- Logo featured prominently in digital and print advertisements (Google, Meta, etc.)
- Logo on printed brochure and event map
- Priority placement of logo across all promotional materials
- 20' x 30' Expo booth with priority placement
- 7 two-day general admission Expo tickets
- 2 tickets to the Member's Dinner & Auction

Gold – \$4,000

- 10' x 20' endcap booth with priority placement
- 5 two-day general admission Expo tickets

Silver – \$2,000

- 10' x 15' Expo booth
- 4 two-day general admission Expo tickets

Dinner & Auction Sponsor – \$5,000

New in 2025, the Dinner & Auction Sponsorship offers targeted exposure at the Annual Member's Dinner!

- Two-minute speaking opportunity during the dinner program
- Individual dinner placards at each seat with Sponsor Promotion
- Dedicated promotional features on social media featuring the Dinner & Auction
- 5 tickets to the Dinner & Auction
- 5 two-day general admission Expo tickets

Supporter – \$500

- 3 two-day general admission Expo tickets
- Online and on-site promotional listing



Vendor Opportunities

Vending at the IAS Tropical Plant Expo offers a meaningful way to connect with a passionate community of plant collectors, hobbyists, and professionals. Whether you are a long-time supporter or a first-time participant, the Expo provides a unique platform to showcase your offerings in a setting devoted to the appreciation and advancement of tropical plant cultivation.

Booth Pricing:

- 10' x 15' – \$900
- 10' x 20' – \$1,250
- 10' x 20' Endcap or Dual Entry – \$1,500
- 20' x 20' – \$1,900
- 20' x 30' – \$3,000

Join the List for Priority Updates on Vendor and Sponsor Registration

Event Details

Annual Tropical Plant Expo

September 20–21, 2025

Miami-Dade County Fair & Expo Center – Miami, Florida

General Admission: \$30 for a two-day pass

Tickets available soon!

IAS Member & Early Bird Discount: Save \$5!

Annual Member's Dinner & Auction

September 20, 2025

Florida International University – Graham Center

Exclusively for IAS Members.

More information and tickets will be announced in the coming months.

New for 2025: Hands-On Workshops & More

In response to valuable attendee feedback, the 2025 Expo will expand programming beyond the traditional lecture series. In addition to a strong lineup of invited speakers, new workshops and social events will be hosted during the weekend, encouraging learning, engagement, and networking across disciplines and interests.

Click Here to Sign Up for Expo Updates!
Including ticket sales, speaker & workshop schedule, vendor & sponsor announcements & more

Follow us on social media for announcements and ongoing coverage leading up to the event!

 [Instagram](#) |  [Facebook](#) |  [Add to Calendar](#)

We Look Forward to Welcoming You!

The IAS Tropical Plant Expo is one of the most anticipated events on the society's annual calendar. We invite all IAS members, supporters, and the broader community of aroid and tropical plant enthusiasts — from hobbyists and collectors to professionals and plant-related businesses — to join us this September in Miami for a weekend of learning, discovery, exceptional plant offerings, and community. Whether you are attending, vending, sponsoring, or simply exploring, we look forward to seeing you there!

