

**A Supplemental Publication for Members of the International Aroid Society**

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## Volunteer Research Associates in the Aroid Research Group at the Missouri Botanical Garden

Thomas B. Croat, P. A. Schulze Curator of Botany  
With the Assistance of Carla V. Kostelac, IAS Newsletter Editor



At the Missouri Botanical Garden, we rely a lot on volunteers. The Garden has over 1800 volunteers in all, mostly retired or semi-retired people who know that they can contribute to the Garden's programs. The Garden's Volunteer Office is managed by Coordinator, Scott Bahan. Scott and his predecessors, Jeannie McGilligan, Jackie Juras and Norma Fraser have managed this program very well. They interview prospective volunteers and then try to place them where the volunteer wishes to work or recommends them for some available position. I have had almost two hundred volunteers in all during my 53-year career at the Garden and generally have between 25 to 35 volunteers at any given time. These are all people volunteering to work in the Aroid Research Group and our program may be unique among plant sciences in the degree to which we make use of volunteers in carrying out plant investigations. Some volunteers soon find that they do not have the time to devote to volunteerism or find other pursuits that they prefer but many stay on for years. The purpose of this article is to mention or list all those who helped and to recognize the efforts of those who stayed and contributed to the success of the Aroid Research Group at the Missouri Botanical Garden. Some volunteers have a record of accomplishment, which will result in a published work while others have devoted great effort just to keep the operation going. Some volunteers have passed away and I will note their passing if I am aware of their death. In order to simplify the presentation, volunteer jobs will be broken down by category and within the category; their accomplishments will be acknowledged in alphabetical sequence to avoid ranking volunteers in terms of importance. Carla Kostelac, my Research Assistant for the last fifteen years, is responsible for coordinating events with all the volunteers, reporting on hours served and assigning space and for any training required (except for plant describers). There will no doubt individuals we have forgotten to mention because our organization only began keeping records since we started using computerization and my work with Araceae began long before we used computers here.

# Clerical Support for Herbarium Work

Many of our volunteer projects are associated with handling herbarium collections and the most basic of these are dealing with herbarium specimens that have been shipped from foreign countries to the Missouri Botanical Garden. Volunteers insert labels in with the specimen, sort the specimens into aroids and non-aroids and send the non-Araceae families to proper herbarium staff. Other jobs involve filing duplicates of mounted specimens when they are believed to be new species. A large space in the herbarium is devoted to the storage of such specimens and it is immensely useful as revisions progress because one can aggregate quickly all the duplicates of any new species making it easier to properly designate isotypes and paratypes. In the days before computerization, we used small paper “chits” to record determinations. Volunteers recorded such names into field books, aggregated, and sorted these chits into order by collector so that they could be mailed to those who sent plants for determination from around the world. Many volunteers were involved with this effort. Now volunteers enter such determinations directly into Tropicos, the Garden’s plant database. Another big task is dealing with herbarium vouchers made in the Greenhouse, some of which are unique (that is from plants that were never vouchered in the field), and others merely duplicates of existing collections. We must check the herbarium to see which the case is because if the collection is not present we add it to the herbarium. Even collections that were made in the field and were deposited in the herbarium may have been sterile or in only flowering or only fruiting condition. Thus if the Greenhouse voucher is needed, even if a duplicate number, it is added to the collection. This is another job carried out by volunteers. The following is a list of those individuals who carried out these important tasks:

## ☀ **Barbara Altenbernd:**



Barb, a former school teacher, has volunteered for me for almost 14 years and knows the most about the operations of the Aroid Research Group. Her most important role is to process new plant species which involves several steps and is crucial to maintaining an accurate account of new species in line to be published. Barb is in charge of maintaining the card file of undescribed species. This allows quick access to proposed new names and helps to prevent duplication. Each card contains a photocopy of the proposed type specimen to help assist in identification. If the species is an Anthurium, the name of its section is also recorded. She also works with plants when they are received as unmounted specimens, sees that they have proper labels to be mounted, and then files them in the herbarium. Barb does all aspects of clerical work including organizing and copying documents and filing photographs and slides. *Anthurium altenberndianum* is named in Barb’s honor. Barb lives with her husband, Jess in Franklin County north of Pacific, not far from where I live. They have two daughters and five grandchildren living in the St. Louis region.

## ☀ **Dolly Darigo:**

Dolly spent most of her time as a volunteer making photocopies of existing literature from the library as well as making copies of my existing reprints for the purpose of exchange to those who requested reprints.

## ☀ **Herman Easterly:**

recorded names on the back of black/white and colored prints and slides based on information in a photograph registry, then filed them in their respective places.

## ☀ **Mary Hammer:**



Mary did a variety of clerical jobs for our group but the largest was that of editing a very large list of new species diagnoses. This list is the first step in the process of describing a plant; the species diagnosis consists of the designation of the type specimen followed by the circumscription of the species (a brief description of its salient characters), as well as a comparison with other closely related species and finally a discussion of how the name was selected. This is an essential resource and Mary’s work with this list was important. Even after leaving the Aroid Research Group, Mary continued volunteering with the Missouri Botanical Garden herb garden, a group that maintains the herb gardens near the Henry Shaw home on the Garden grounds.

### ☀ **Tony Herrmann:**

Tony was involved with Amy Redfield's OPUS picture project and has continued since the completion of that task doing work with digital images, mostly dealing with the naming of images taken off site. These he makes available for into input into Tropicos.

### ☀ **Peggy Kachulis:**

Peggy was in childhood and elementary education before retirement. She started her volunteer work at the Garden with Earthways Center in April of 2004 but sometimes also worked with the Membership Services Desk, and the Visitor Engagement Station. She began working also for the Aroid Research Group in October of 2009 usually working closely with Barbara Altenbernd when organizing and filing collections. Peggy organized the –MO collections which are the unmounted specimens of undetermined Araceae. She retired from volunteering in July 2018 and she and Paul, her husband of 44 years, live in Rock Hill. They have two daughters, Christina, a nurse at Christian Hospital and Andrea, working with the National Forest Service in Everett, Washington.

### ☀ **Catherine Quinn:**

Kitty volunteered to work on the amalgamation and organization of documents and spreadsheets, which were found to be stored in many different places in the Garden's computer system. She had to proofread each document to learn about its contents and decide where to file it. Her work greatly organized the chaos and made our retrieval of documents much easier. Kitty is a retired nurse and lives in the French Hill Neighborhood.

### ☀ **Kay Rossman:**

Kay Rossman was a genius at organization and was a skilled clerical worker and editor. Kay lived in Richmond Heights and was a tax consultant so that after the tax filing season was over she had lots of time. She worked for us for several years and took on the task of creating the first Index to Aroideana (Croat & Rossman, 1991).

### ☀ **Ann Ruger:**

Ann was a resident of Kirkwood and took on an enormous project that carried on for months. I was interested in getting copies of all aroid literature for my office files. Photocopying the main works was straightforward but each aroid text mentioned many other articles and these articles in turn would cite others so it required making long lists of literature to search. Ann traced back each literature cited and spent hours in the library finding texts, then making photocopies. This great accomplishment has made my work so much easier since most literature is immediately available in my files organized by author and by year.

### ☀ **Eleanor Sauer:**

Eleanor took on without reservations what proved to be one of the most ambitious assignments ever, the translation of Adolf Engler's *Anthurium* treatment, which was published in Latin in *Das Pflanzenreich*. Each time she had completed a significant section of the text we met to solve the translations of botanical terms that she did not understand. I am deeply indebted to her for this valiant effort. Unfortunately, the old computer that she used to do this work became defective and all that remains of her work is the original printed translation.

☀ **Verla Bowes:**

Verla recorded names on images and filed them by name in slide holders deposited in hanging folders for easy retrieval. She also filed herbarium specimens into the herbarium compactors.



## Web Design and Digital Imagery

Modern taxonomy is increasingly dependent upon digital photography and many of our volunteers work with this medium. It is only a part of web-based productions. PowerPoint presentations are another part of this digitized world and these presentations are necessary for teaching or presenting information in conferences.

☀ **Alan Bonomi:**



Alan works for the airline industry in the Boston area and works long stretches, then gets long stretches of time off, so he was looking for a volunteer job that he could do for us remotely. This sort of job is ideal for persons willing to label digital images, so we send boxes of scanned slides to Alan, and he reads the labels on the slide and adds that information to the digitized images.

☀ **D'Aun Carrell:**

D'Aun is our current digitizer working one or two days a week digitizing prints, slides, and descriptions from publications that are later used in part for the Determination Tool or for quick access to literature for our research. She also volunteers at the new Stephen and Peter Sachs Museum at the Missouri Botanical Garden along Tower Grove Avenue. She works closely with Steve Aylward who is always in need of something scanned for his Determination Tool. We have been digitizing all of our slides, prints and even some of our large collection of black and white negatives, and then making them immediately accessible by such powerful indexing tools as Picasa and now Lookeen.

☀ **Susan Fenwick:**



Susan is from my home state of Iowa and worked for Rockwell Collins Inc. in Cedar Rapids, Iowa. She was an avionics software engineer, and seemingly could do anything in the field of computers. Susan created an Araceae Project website in association with Tropicos, which allowed us to expand Tropicos to provide a sectional classification of Anthurium, something Tropicos does not allow. Since Anthurium is one of the largest genera of plants in the world with perhaps 3000 species, it is essential that we are able to break it down successfully into smaller units, for example, sections. Presently, there are about 20 natural groups that we know about, and these are now formally published. Susan also added complete descriptions for most of the sections. In 2012 the Philodendron Checklist was added to the Araceae Project, starting with approximately 935 species names. Her website is entirely linked to regular Tropicos so that is no conflict but if one needs information on sections or a sectional classification you need to enter Projects. Tropicos has many of these project pages, mostly for floristic units

and we are working on adding additional aroid Project pages, for example Araceae of Colombia and Xanthosoma. Susan completed many PowerPoint presentations for me, and with Carla Kostelac, prepared teaching posters with photographs and information about Araceae of La Planada, Nariño, and Flora in the Lita-San Lorenzo region of northwest Ecuador. After working for six years with the Aroid Research Group, Susan volunteered for George Yatskievich and Bob Magill on the Ferns and Lycophytes project page in Tropicos, which she populated with hundreds of species descriptions culled from published manuscripts in support of the World Flora Online Project. I still rely on her for the unsolvable little things that happen from time to time and she always has good answers. Susan lives with her husband Charles in St. Charles County, and volunteers as STEM co-director for the Ballwin-Chesterfield branch of the American Association of University Women (AAUW). Three of her nature photographs, one of them taken at the Missouri Botanical Garden, have won the national AAUW Art Contest held each year. *Anthurium fenwickianum* Croat is named in her honor.

### ☀ Jane Gibbons:



Living in O'Fallon, Missouri with her husband, Jane wanted work that she could do at home. She regularly carries out the more difficult digital labeling jobs that we have. Usually we give her the digital images as well as the original set of slides or pictures, which were scanned, and she types in the information, which is given on the originals. Jane has done this work for thousands of images. Having the images in digital form allows instant retrieval using Picasa. She will be honored by the name *Anthurium gibbonsianum* Croat.

### ☀ Chet Jankowski:



Chet was an entrepreneur in the IT industry, forming his own small company in St. Louis. He was one of the group that was assembled by Amy Redfield during my three year-long N.S.F. OPUS grant period where they skillfully managed to get more than 8000 images of unknown species labeled and uploaded into Tropicos. Chet has also been responsible for converting all of my PowerPoint presentations and scientific works onto the home page on the Missouri Botanical Garden website. Chet and his wife, Larrie (see Larrie Jankowski below under Greenhouse) live in a historic old home on the cliffs overlooking the Meramec River in St. Louis County. They are from Wisconsin and spend part of each summer in the Wisconsin Dells.

### ☀ **Sara Johnson:**



The late Sara Johnson was from Jacksonville, Illinois and a Garden volunteer for thirty years working in several different departments, including serving as a Garden Docent, a Special Event Volunteer, and most recently helped in the Science & Conservation Department. She had provided 650 hours of volunteering for the Garden and had achieved her Master Gardener Certification. Sara held degrees from Illinois University and a Master's Degree from Washington University. In the Aroid Research Group, she edited descriptions and helped my employee, Marcela Mora with her study of *Philodendron*. She was a web designer and was working on the development of web sites both for *Xanthosoma* and for the Flora of Colombia when she died on June 16, 2019 following injuries in a car accident.

### ☀ **Theodore Meyer:**



Ted is a retired Air Force and Boeing person and a real expert with spreadsheets who worked on the determining and labeling of digital images, especially those from my field trips in the tropics. He was one of Amy Redfield's team that worked on the labeling and insertion into Tropicos of the 8000 digital images taken during the OPUS Project.

### ☀ **Nancy Moor:**

Nancy spent a great deal of time digitizing our 4 × 6 inch card files with descriptions and pictures of Araceae. This effort was the beginning of our development of the Determination Tool and our attempt to make information more readily and quickly accessible.

### ☀ **Amy Redfield:**



Working closely with the Aroid Research Group for 6½ years, Amy proved to be an amazingly versatile person. As Document and Image Manager, Amy was a major organizer and even managed her own group of volunteers, initiating and overseeing 18 different projects for volunteers to fulfill. Examples include arranging for other volunteers to label scanned images, download images sent for determination by others from throughout the world, and process and label Croat photos made in the field, past and present. During my OPUS grant project, I visited 51 herbaria in Europe and the Americas to study Araceae, and all undetermined collections were photographed. These needed to be labeled and entered into Tropicos. Amy's team was called on for this daunting prospect and carried it through to completion. She also produced all my PowerPoint presentations and posters. For more details, see the write up for Constantino Schillebeekx below.

### ☀ **Constantino Schillebeekx:**



An immigrant from Belgium, Constantino worked at a startup biological firm designing a more efficient pig gut fauna to improve productivity. He was recruited as a part of Amy Redfield's big crew, which volunteered to process 8000 images of plants to Tropicos. Since these digital images all needed to be labeled, a laborious process at best, Constantino designed a computerized program that automatically fed images through a computer in sequence stopping only when the image of the label was in view. Thus, the information needed to be entered only one time for each set of images, enabling other volunteers to more rapidly process these images.

### ☀ **David Singer:**



David was one of the principal players in the big effort to name 8000 images of undetermined specimens from South America. He was involved with the most difficult images to determine specimens and worked closely with me to resolve all the problems before the specimens were uploaded to Tropicos.

### ☀ **Rebeca Wallace:**



Becky spent a couple of delightful years with us using our Epson 750 scanner and also labelling images. She scanned slides, prints and negatives as well text, creating a pdf for use in the Determination Tool. Becky lived in St. Louis County and loved horses. She eventually moved to Texas with her boyfriend and the horse and now lives on a small ranch.



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## **Scientific Studies and Publications**

Several people work directly in the process of producing or editing scientific publications and three of these individuals, Steve Aylward, Susan McQueen and Joshua Neely, have worked with the production of Lucid Keys. These are multi-choice electronic keys used to determine plants by having the program store many characters for all the species then dismiss (reject) those species which do not share characters selected while trying to determine plants. These keys are tools which are directly essential for determination and revisionary work since the Lucid Keys help to insure that a given specimen really is a new species.

### ☀ **Steve Aylward:**



I have had many former teachers in our volunteer program since many are attracted to volunteerism but none better than Steve. During his long tenure of more than 10 years, he has become an integral part of our program. Steve used to teach Latin (along with history) so he is very useful in the application of Latin names and in translating critical Latin passages but his main role is in the determination of plants. Now skillful in the use of Lucid (the computerized multi-entry key for determining plants mentioned above), Steve uses a variety of Lucid Keys that we have created (Adelonea, Anthurium, Dieffenbachia, Philodendron, Stenospermatum and Xanthosoma) along with what we refer to as a Determination Tool that he produced to narrow down the possible names for all undetermined collections. With each name determination, the operator fills out a special work sheet which enumerates all of the choices made in the keying process so that I can evaluate if any mistakes were made in interpretation or the order of the choices. In each case, a minimum of 10 names remain, those with the greatest affinity to the specimen being keyed out. Steve's final job is to indicate how each species represented in the final list of names differ from the specimen being determined (or in some cases, when correctly determined) shows no differences at all. The species remaining must all be compared with images and sometimes with official descriptions, to verify the differences (or similarities) to make the final decision that the plant that is being determined is really new to science or alternatively could be one of the species remaining in the list of choices. This is done with the Determination Tool, another product also developed by Steve. This is a compact electronic file with a folder for each species that contain both images and descriptions for all published and unpublished species. The Determination Tool allows the quick inspection of images and descriptions of each species. Steve also acts as final editor of all new descriptions because he enters all descriptions into Lucid. *Anthurium aylwardianum* Croat is named in his honor.

### ☀ **Susan Daniels McQueen:**



Susan McQueen was a talented individual who first worked as a veterinarian and later as a molecular biologist at Washington University in St Louis. She quickly developed an interest in the Lucid multi-choice determination key and spent several years determining plants with the key. Susan was a real professional at this job and would use the herbarium to confirm that the plants on the penultimate list of possibilities were not the plant that she was trying to determine. She developed an outline of how to print these lists, so that the results she gave me with each plant were always very neat. Susan also learned how to write Lucid Keys and wrote Keys to *Adelonea* and *Dracontium*, and populated both with all the descriptive information needed as well as populating the keys with images of the species. Posters for both of these projects were prepared for the International Aroid Conference in Cali in 2018. Susan's husband, Don, also volunteered at the Garden working as a trained plant expert on the Help Desk Hotline. Susan is honored by *Anthurium mcqueenianum* Croat.

### ☀ **June Mueller:**

As a computer specialist working in IT, June was especially gifted with the operation of spreadsheets. She personally built the *Philodendron* spreadsheet with categories for all the subgeneric classifications noted. These spreadsheets are constantly updated with the addition of every new species and are essential to prevent duplication of names. June got her interest in gardening after tasting homegrown tomatoes in her neighbor's backyard, volunteered at the Garden and in time became a Master Gardener in 2008, then volunteered for a variety of events including the Aroid Research Program in 2012. Now retired after 37 years from Nestle, June continues to enjoy her volunteer work as a life coach, as well as the challenges of being a property manager.

### ☀ Joshua Neely:



Josh is a professor at Lindenwood University in St. Charles and is working with me on a Revision of Stenospermation. He and his students describe species that I assign to him. Josh is good at writing Lucid Keys and has written one for Stenospermation, Dieffenbachia and Spathiphyllum. Three of his students, Melissa Linneman, Lillian Marchant and Ashley White, are doing a special project for me, which will lead to credit hours at the University. Their project is a Revision of Anthurium sect. Belolochium (Araceae) from the Lita-San Lorenzo Region (Ecuador, Province Esmeraldas). The other students from the Academic year 2018–2019 are Connor Ciemiewicz, Jordan Hessler, Mahmoud Ismail, Dawn Louis, Sebastian Macedo, Christian Reese and Justin Winnett and were all involved in studying and describing new species of Stenospermation.

### ☀ Mary Stephan:

Mary worked extensively with the Flora of the Guianas Project for more than a year and made great progress editing descriptions in that treatment. Mary lived not too distant from the Garden and has a nice garden of her own.

### ☀ Robyn Wilkerson:

A resident of nearby Fenton, Robyn proved to be a very good editor and spent a lot of time editing the Monstera of Central America treatment and took on the detailed job of going through the entire Philodendron Revision of Central America which we lost, regained only from a scanned version of the revision. Since the scanned version was filled with many errors, this was a tedious but essential job. Robyn worked at Logan College of Chiropractic Medicine for 27 years and had her own practice. There she edited the College Academic Catalog, Student Handbook and Faculty Handbook so she already had a lot of experience with editing. Having grown up among farmers and farming families, she had a keen interest in gardening. After retiring, she began volunteering and opted to work with us in the Aroid Research Group. She is still involved with Rose Society of Greater St. Louis, gardening at her home and enjoying her family including three grandchildren.



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## Plant Describers and Revisionists

Probably no task is closer to my heart than that of describing plants. I spent a good deal of every day doing this myself but the need is overwhelming since we have hundreds of species to describe. One of the obligations of my N.S.F OPUS Grant was to make sure that all known species were entered into the Lucid Key for Anthurium and Philodendron. This proved to be an overwhelming undertaking and I welcomed all the support I could get. Many volunteers in the Aroid Research Group participated by describing plants. Typically, volunteers learn to describe plants with a series of training sessions where I instruct them with the order and morphology of each genus. Completed work is saved in a Proofread folder for each individual. Using the created file and the herbarium specimens, I proofread each treatment to assure accuracy using track changes. Once the writer has seen and understood the corrections, they are accepted and then modified according to my instructions. Sometime it requires more hands-on training but usually the corrections I make are understood. Each volunteer has many accessory tools available including pictorial listings, revisions and even previously described species in the same group. Once completed, the descriptions are saved in the Completed Descriptions folder and in their respective manuscript for later publication. Some individuals who worked as plant describers gave up or left before accomplishing the requisite amount of work to warrant a publication. Everyone was given the same training to describe plants. Usually that began with making improvements on existing species for the Araceae treatment for the Flora of Ecuador Project. Once they reached a certain proficiency, they were assigned several totally undescribed species to describe and this resulted in a joint publication. While all did good work, some found the work not to their satisfaction or ended up not having enough time to continue this sort of work. Among those in this latter category were:

☀ **Amy Barge, Lee Cartwright, Tonya Dodson, Steven Danaubauer, Gaylene Englebrect, Ruth King, Ana Londoño, Michael Lublin, Marshall Manne, Katie Mead, Gerald Nell, Rita Pace, Nicolas Russell and Craig Sickel.** They are welcome to come back to continue their work if they wish to. We certainly thank them for the efforts that they made.

☀ **Anbreen Bashir:**



A professor at Harris-Stowe State University in St. Louis, Anbreen is working on a Revision of *Anthurium* sect. *Tetraspermium* and a Lucid Key to the genus *Chlorospatha*. Anbreen began working with us while a graduate student at St. Louis University while working on sorting out species of *Anthurium* sect. *Porphyrochitonium* for the Lita-San Lorenzo Region. I presented a poster for her work with *Anthurium* sect. *Tetrasperminum* at the XII International Aroid Conference in Cali in 2017.

☀ **Jo Ann Beiser:**



Jo was my assistant for about a year while she worked at the Missouri Botanical Garden, then after some years of raising her family, returned to volunteer, describing several *Philodendron* species. She and her husband Bob live not far from the Garden and their son James attends Missouri University of Science and Technology in Rolla.

☀ **David Belt:**



A professional biologist who had taught in several Missouri colleges before moving to St. Louis, David easily fit into our Aroid Research Group. He worked for several years on the Revision of *Anthurium* section *Calomystrium* along with volunteer, Jere Deal. David is a distant relative of the renowned British naturalist and mining engineer, Thomas Belt who published a book on his observations he made in Nicaragua during the 19th century. David himself had a long history of involvement with Nicaragua, mostly working with humanitarian aid efforts during and after the political strife resulting from the Sandinista takeover of the government. His publications include a paper that published new species of *Anthurium* section *Calomystrium* from Mexico and Panamá (Croat, Belt & Deal, 2017). He is honored by *Anthurium davidbeltianum* Croat.

### ☀️ **Laura Brossart:**



Laura worked on making descriptions of a series of *Anthurium* species in four different sections before concentrating on doing the Revision of *Anthurium* section *Dactylophyllum* with 3-parted leaf blades (Croat, Brossart & Kostelac, 2008). The work with the Garden helped her to obtain a job in the fall of 2008 at the Center for Public Health Systems Science at Washington University's Brown School where she has worked for 12 years. She initially worked as a research assistant on a tobacco control project for the CDC and now works as the Assistant Director of Communications and Dissemination where she does a lot of writing and design of information graphics and other visuals.

### ☀️ **Anna Brzyski:**



A high school student at the time, Anna was a student at Rosati-Kain High School where my daughter Anne was going to school. Anne arranged a trip to the Garden for her class and the young Polish immigrant who had managed to escape that communist country during the Solidarity Movement was enthusiastic about what we were doing. Her dad had been heavily involved in anti-government agitation at the time and was in danger of persecution so he and his family were given asylum in the U.S. Anna asked if she could volunteer for me after school and became an excellent plant describer and even worked describing the ovules of pickled material. Anna was interested in art and following graduation she attended the University of Chicago and got a degree in art history. Since 2002, she has been teaching at the University of Kentucky. She is also project director and compiler of the Polish Art Archive, a digital database of primary source materials pertaining to Polish art, a project funded by Southern Illinois University and the U.S. Department of Education. She is also the designer and the site manager of the HGCEA website (Historians of German & Central European Art & Architecture). She is also the founder and editor-in-chief of the Art Worlds Press.

### ☀️ **Lili Marleen Calderon:**



Marleen Calderon worked with us for less than a year but was very productive, describing 10 species of *Anthurium*, three of which were published as new (Croat et al. 2011). Marleen was a native of Guadalajara Mexico and was visiting a relative in St. Louis when she decided to volunteer at the Garden to improve her English and learn more about Araceae. She returned to Mexico where she and her husband Manuel live in Guadalajara while she works for a government conservation agency.

### ☀️ **Corinne Carey:**

Corinne was a high school teacher from Illinois who wanted to work on a project and I assigned her a paper with the 3-lobed *Philodendron* species but after describing a few species, she found that the task of driving to the Garden after her long day of work was just too difficult and gave up the project. Nevertheless, her contributions were passed on to Jason Zhang who essentially finished the project.

### ☀ Jere Deal:



Jere is a trained writer and works in the health care industry. I appreciated Jere's attention to detail and was delighted for him to begin describing new species of aroids. Jere is working on a Revision of *Anthurium* sect. *Calomystrium* and was involved with describing new species of plants. Some of those species of *Anthurium* sect. *Calomystrium* from Central America were published with David Croat (Croat, Belt & Deal, 2017).

### ☀ Sofia De Oliveira:

Sofia was a student just out of high school and preparing to go to college when she worked for us. She worked on describing species of *Anthurium* sect. *Belolonchium*.

### ☀ Xavier Delannay:



Xavier, a native of Belgium, got his university training at the University of Louvain in the field of botany. He was from his youth interested in plants and made herbarium collections from many parts of Europe (these are now mostly deposited in the herbarium of the Missouri Botanical Garden). Since there were few jobs in botany in Europe, Xavier moved to the United States with his family and did a post-doctorate in genetics at the University of Iowa. Later he began a long career with the Monsanto Corporation and was on the team that designed the Round-Up resistant soybean that has revolutionized farming. After his retirement from Monsanto, Xavier returned to his interest in taxonomy of plants, volunteering in the Aroid Research Group at the Missouri Botanical Garden where he became a prolific researcher. He described many new species, 6 new species from the Amazon basin in Ecuador (Croat, Delannay & Kostelac, 2008) and in another paper 8 species of *Philodendron* and 27 species of *Anthurium* from Colombia (Croat, Delannay & Kostelac, 2010). Later he assisted me in completing a couple of projects abandoned by former interns or students, one was a Revision of *Philodendron* from the Lita-San Lorenzo Region which had been started one summer by Sloane Duncan (Croat, Delannay, Duncan & Kostelac, 2016) and another started by REU student, Robbie Wood, A Revision of *Anthurium* sect. *Polyneurium* from Carchi Province, Ecuador (Croat, Delannay & Wood, 2018). Then Xavier began a revision of what could be considered the most difficult genus in the family Araceae, *Xanthosoma*. This resulted in four separate revisions for different parts of the neotropics, namely for Western South America, (Croat, Delannay & L. P. Hannon, 2017); Central America (Croat, Delannay & Ortiz, 2017); the Guianas (Croat & Delannay, 2017a) and Venezuela and the Caribbean countries (Croat & Delannay, 2017b). He also learned to use the Lucid Program and wrote a Lucid Key to *Xanthosoma*. In order to wrap up the studies with the Caladieae, Xavier also helped to publish a paper dealing with new species of *Caladium* and *Syngonium* (Croat, Delannay, Ortiz & Diaz, 2019). He initiated and carried out investigations leading to the Revision of the Araceae of the Cordillera del Cóndor in southern Ecuador (Delannay & Croat, 2020). His final project, again one that he initiated was a Revision of *Anthurium* sect. *Leptanthurium*. Xavier attended the XII International Aroid Conference in Cali, Colombia and presented a paper on *Xanthosoma* then later participated in a field trip to the Department of Chocó. These many accomplishments are unparalleled in my many years of being associated with volunteers. Xavier and his wife Bernadette live in the woods not from the Daniel Boone farm near Defiance.

## ☀ **Geneviève Holveck Ferry:**



Working as a horticulturist in one of Europe's finest Botanical Gardens, the Jean Marie Pelt Botanical Garden in Nancy, Geneviève has learned to love aroids and has gotten to meet aroiders from all parts of the world. She helped to organize the IX International Aroid Conference at the University of Nancy. Working as my field assistant for most of the past ten years has allowed her to become a real authority with Neotropical Araceae and to botanize in the Dominican Republic, Cuba, Suriname, French Guiana, Colombia, Ecuador and Peru. She is an excellent grower of aroids and assists in the preparation of scientific papers dealing with the Araceae of the Province of Carchi (Croat & Ferry, 2015) describing new species (Croat, Scherberich & Ferry, 2006; Croat, Scherberich, Ferry & Mora, 2012). Geneviève was born in Schirmeck-Labroque in Alsace Province and was trained at the Wintzenheim School of Horticulture near Colmar, France. She was married to the late Jean Paul Ferry and with him practiced her trade at the Chitelet Alpine Gardens before joining the staff of the botanical garden in Nancy where she has worked for 42 years. *Anthurium ferryae* Croat, *Philodendron genevieveanum* Croat and *Stenospermation ferryae* Croat are named in her honor.

## ☀ **Joan Frazee:**

A student at the University of Missouri-St. Louis at the time, Joan spent part of a semester doing a work-study project in my lab working on a treatment of the 3-lobed *Philodendron* species. Joan did a lot of work with the original separation of species but got very few species described before her time was spent. These efforts continued with work by Corinne Carey (see above) and was later well advanced by Jason Zhang and even later by Marcela Mora.

## ☀ **Mark Frei:**

Mark was a retiree who described new species of *Anthurium* and a paper will be published with his new species (Croat & Frei, in prep.)

## ☀ **Ben Friedenberg:**



Ben spent about a year and a half working with us describing new *Philodendron* species (Croat, Friedenberg & Kostelac, 2014) during his years of study at Meramec Community College where he got a degree in Horticultural Science. Later he completed a Bachelor's Degree at the University of Missouri in Plant Science with an emphasis in breeding, biology and biotechnology graduating in 2017. He then attended DePaul University in Chicago studying big data and quantitative analytics for a time, and then he moved to Boulder, Colorado. Since 2018 he has been working as an assistant breeder in hemp for a biotech company called Front Range Biosciences in Colorado.

## ☀ **Ann Mertz Grace:**

As a former researcher at both St. Louis University and Washington University, Ann was a very skilled professional. She graduated from Bryn Mawr College in 1954 (A.B., biology) and then moved to St. Louis where she obtained a Master's Degree at Washington University. While in graduate school she met Richard (Bud) Harold Grace and married in 1956. During her undergraduate college years on the east coast, Ann worked summers at the Mount Desert Island Biological Laboratory in Maine, interacting with prominent doctors and researchers. Ann started her formal career at St. Louis University as a biology laboratory lecturer in the early 1970s. After a few years of teaching, Ann moved into medical research. Ann got her start in laboratory research at the Veterans Hospital in St. Louis. Then, she worked many years within various departments at the Washington University Medical School complex. Ann ended her formal scientific career at Monsanto, but never stopped teaching or researching. During her retirement, Ann studied and grew cacti and succulents and became

a participating member of the Henry Shaw Cactus and Succulent Society. Also, during her retirement, she proudly obtained a volunteer position at the Missouri Botanical Garden. She came to the Garden several days a week, traveling by bus from her home in St. Louis. She was one of my most productive researchers in our program and worked with species in a variety of sections of *Anthurium*, publishing species of *Anthurium* from South America, one a paper with Bolivian student Noel Altamirano (Croat et al., 2012) and another with 11 species (Croat et al., 2013). Her most ambitious project was to help complete a study of species of animals and plants discovered on Cerro Colán in Peru, which reported 983 species, and 513 genera in 45 families of higher plants including 10 new species of Araceae (Croat, Grace, Barbour, Schulenberg & Graham, 2020). She was also preparing to begin work with a Revision of *Anthurium* sect. *Digitinervium* when she was suddenly aware that she had cancer. The majority of Ann's collection of cacti and succulents will be donated to the Henry Shaw Cactus and Succulent Society.

### ☀ James Grib:



Jim Grib was a professional chemist who spent his career at Anheuser-Busch Brewing Company, a local St. Louis company (now owned by Belgian company, Inbev). He worked for me for 6 years and helped me with a Revision of *Anthurium* sect. *Belonchium* and will be co-author of that revision (Croat & Grib, in prep). In all, Jim described 125 species of this section. He was also closely associated with *Anthurium* sect. *Porphyrochitonium* (describing 76 species in that section) and is co-author of an upcoming review of that section (Croat et al., in press). In addition, Grib described 24 new *Philodendron* species some of which were published already (Croat, Grib & Kostelac, 2012) as well as six additional *Anthurium* species in other sections. With 229 descriptions, he probably exceeds the life productivity of most botanists. His scientific background and his great attention to detail made him a superb worker whose descriptions were always of the highest quality. For example, we use his work to demonstrate to new volunteers how their end product should appear. Jim retired from his voluntary duties when his daughter had twins and the family needed to provide support. Jim's wife Colleen is a schoolteacher and they love to travel. They have a cottage in the Lake of the Ozarks where they spend a lot of time in the summer months. We miss his pleasant demeanor and his great productivity and only hope that he will one day return to do more science. *Anthurium gribianum* Croat and *Philodendron gribianum* Croat are named in his honor.

### ☀ Dylan P. Hannon:



Dylan is a long-time associate and a good friend who worked for three years as my Assistant at the Missouri Botanical Garden. He worked with me in the field throughout Central America and later in Esmeraldas Province in Ecuador. Owing to his position at the Huntington Botanical Garden, he is in contact with many new and interesting species and a frequent benefactor to the International Aroid Society plant sale. We are collaborating presently on several papers describing many new species (Croat, D, P. Hannon & Kaufmann, in press); (Croat, D. P. Hannon & Kjellberg, in prep).

### ☀ Maya Renee Hanson:



Maya, a student at Missouri University of Science & Technology in Rolla, worked for the Aroid Research Group during one of her long spring breaks to describe new species from Venezuela (Croat & Hanson, 2020). She is a student majoring in biochemical engineering with a minor in biomedical engineering and was accepted as a summer intern with Boehringer Ingelheim Pharmaceuticals in San Francisco until the Corona virus caused the program to be canceled.

### ☀ **Jerry and Linda Harrison:**



Jerry and Linda are American biologists who have retired from the United States and are living permanently in Panamá in one of Central America's biological hot spots on Cerro Jefe. Together they are studying the flora and fauna of the region with Jerry's interest in plants and Linda's interest in butterflies and moths, but they work together on field trips and Linda is often credited with the first find even when the subject is a plant. Collectively they have found many new species of Araceae in several genera including *Anthurium*, *Monstera*, *Philodendron* and *Syngonium*. They take excellent pictures, make herbarium vouchers and return endlessly to areas to watch the development of plants we are interested in knowing or describing. They routinely sponsor visits by other botanists from many parts of the world who are working on Cerro Jefe.

### ☀ **McKenzie Hempe:**

McKenzie was a St. Louis high school student who had just graduated and spent part of the summer with us before going off to college. She was describing new species from the La Orquídeas National Park in Colombia (Croat, Hempe & Kostelac, 2015). McKenzie is now in officer's school with the U.S. military.

### ☀ **Robert Hormell:**

A James Scholar graduate of the University of Illinois, Bob has a scientific background as a trained anthropologist but spent most of his career in the business world working for Southwestern Bell. He was responsible for information technology strategic planning of the Yellow Pages subsidiary, an essential part of their business in the 1980s and 1990s that focused on the development of programs involved in its computer systems enhancement and management. The transition into science and into his role with the Aroid Research Group was an easy one for Bob. He is extremely versatile with the handling of descriptions and the spreadsheets needed to monitor his progress with his Revision of *Anthurium* sect. *Cardiolonchium*, now one of the largest groups in this genus of an estimated 3000 species. While his revision is not yet published, he is including several new species of *Anthurium* sect. *Cardiolonchium* in a soon to be published paper describing 30 species of *Anthurium* from Central America (Ortiz, Croat & Hormell, 2020). Bob is also working with *Anthurium* sect. *Andiphilum* in Central America and published a paper formally describing the new section (Croat & Hormell, 2017).

### ☀ **Alana Jackson:**

Alana was a student at St. Louis University when she came to volunteer for us. She described about a dozen species including seven new species and a new variety for the Cordillera del Cóndor region in southern Ecuador (Croat, Jackson & Kostelac, 2010).

### ☀ **Maggie Joyce:**

Maggie was a student at St. Louis University when she worked with our program. She worked on describing a number of *Anthurium* and *Philodendron* species (Croat, Joyce & Kostelac, 2010).

### ☀ **Polly Kinslowe:**

Polly worked as Project Manager for large urban developments in St. Louis and in Miami and volunteered for both Fairchild Garden and the Missouri Botanical Garden. In the Aroid Research Program she worked on a yet incomplete revision of *Philodendron* subgenus *Philodendron* section *Philodendron* series *Rupicola* (Croat & Kinslowe, in prep.), a group of *Philodendron* species with creeping rhizomes. Most of the species have been completed but Kinslowe left our program to take care of her sister who had developed a cancer.

### ☀ Ryan Kirkman:



Ryan was from neighboring Illinois in O'Fallon when he volunteered at the Garden. He described *Philodendron* species for the Flora of Ecuador Project and helped us with a big plant sale in the Greenhouse. Ryan graduated from Elmhurst College and is working as a teacher of biology, honors zoology and paleontology at East Knox Junior/Senior High School in Mt. Vernon, Ohio.

### ☀ Karen Kjellberg:

Karen was a biologist working at a pharmacy who wanted to try to get more training in botany in order to improve her chances of getting a more biologically oriented job. She worked in my office at night after her work and described a species each night so she was making good progress but as is often the case with volunteers with full time jobs, she soon found it overwhelming. Karen's new species were all in cultivation at Huntington Botanical Garden and she will be credited in a paper being prepared which will publish many new species from the Huntington Garden (Croat, Hannon & Kjellberg, in prep.).

### ☀ Keith Lee:

Keith worked with us for one summer between his high school graduation and his first semester at the University of Missouri. He worked on describing 11 new species, mostly members of sect. *Cardiolonchium* (Croat, Lee, Wodstrchill & Kostelac, 2011).

### ☀ Laura Lytle:

Laura was a college student who worked with us during the summer of 2016 and 2017, describing many *Anthurium* and *Philodendron* species for the Araceae of Ecuador Project. None of the species represented new species. She will be honored by a new species, *Anthurium lauralytlanum* Croat.

### ☀ Tom Mines:



Tom, a 1970 graduate of the University of Missouri (Columbia) and a 1973 graduate of Southern Illinois University (Carbondale) taught chemistry at Florissant Valley Community College for most of his career and still teaches part time at Forest Park Community College. He joined our program as a Volunteer Research Associate in 2017 and has devoted his research to *Philodendron*, the only member of our volunteer group that regularly works on that genus. Already he has published three papers: A Review of *Philodendron* subgen. *Philodendron* Nomenclature in South America– New Species of *Philodendron* (*Araceae*) from South America (22 plant descriptions), New Species of *Philodendron* (*Araceae*) from Colombia, South America (12 plant descriptions), and New Species of *Philodendron* (*Araceae*) from the Northern Andes Regions, South America (12 species) for a total 46 of new species (Croat, Mines & Kostelac, 2019). Tom and his wife, Cheryl live in Troy, Illinois.

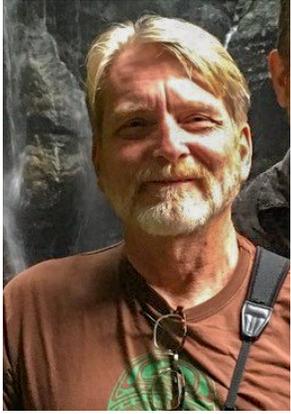
### ☀ Johannes (Joep) Moonen:



Living in French Guiana, Joep easily qualifies as our most remote Volunteer Research Associate. He is Dutch, born and raised in Utrecht where he visited the botanical garden each week on Wednesday, a day on which the garden was free. However, in 1973 he moved to Suriname to work at the Paramaribo Zoo and served as its Director from 1979 to 1987. He knows the Guianas very well owing to his business in biological tourism. Joep is equipped to take his guests into the field on land or water nearly wherever they want to go. He has been interested in aroids for many years and has made many discoveries of new species including a new species of *Monstera* (Croat, Moonen & Poncy, 2005) and two new species of *Philodendron* (Croat & Yu, 2006). He is a keen observer and has managed to discover

several hybrids of *Philodendron* in the wild (Croat & Moonen, 2007). Joep and I have been friends and research partners for many years. He lives with his wife, Marijke at Emerald Jungle Village where he grows and studies many aroids. He discovered seven new Bromeliaceae and *Aechmea moonenii* Gouda as well as the aroid, *Anthurium moonenii* Croat & Gonçalves and

### ☀ Daniel Mount:



An employee of the Milwaukee Museum of Natural History at the time, Dan wrote to ask if he could volunteer to work on some project for the summer months. He devoted much of his summer in 1987 to research with the Araceae of Paraguay (Croat & Mount, 1988). He obtained his B.S. at the University of Wisconsin in Milwaukee and later moved to the Seattle area where he was involved with Garden designs in Germany and Italy. Now Dan is the manager of a private estate, volunteers at the University of Washington determining plants from the western USA and writes a bimonthly column in Fine Gardening. He is also doing floristic studies in an area in the Snoqualmie Valley east of Seattle as well as doing a checklist of his 7-acre property. Dan is already up to 1700

### ☀ Allen Niedermann:



Allen was a teacher from McKinley High School in St. Louis who worked for much of the summer of 2011 on a Revision of the Araceae of the Bellavista Cloud Forest Reserve in Ecuador. He is still working for the St. Louis Public School District at McKinley High School. Allen has a B.S. in Entomology and a B.S. in Forestry from Iowa State University.

### ☀ Anne Nothdurft:



Anne was a science teacher at Mehlville Senior High where she met her husband, Edwin. She studied botany both as an undergraduate and for her Master's Degree under David Dunn at the University of Missouri and even taught in his laboratories so she came well-prepared to work with plants. She described several new species of *Rhodospatha* from South America (Croat & Nothdurft, in prep.). Edwin got his doctorate in physics and then taught at Rockwood. They live in Afton, not far from the Garden but will soon move to Ballwin to be nearer to grandchildren. They have two well-educated sons and two grandchildren. We will never forget Anne. She gave us two magnetic rulers that are now essential for obtaining accurate coordinates on our big life zone maps we use to look up the life zone ecology of our collections.

### ☀ Rebekah Outman:

While a student at Washington University, Rebekah came regularly each week to describe plants and was very productive. She published new species from Venezuela and the Guianas (Croat, Outman & Kostelac, 2010).

### ☀ David Scherberich:



From his position as Supervisor of Living Collections at the Lyon Botanical Garden in France, David is in the enviable position of seeing many living aroids every day. He has his own website devoted to aroids and it is regularly questioned about the determination of aroids by people throughout the world. Certainly, he is one of the most knowledgeable horticulturists in the study of aroid taxonomy that we have. David has been a collaborator with me for many years and has spent time in the field with me on two separate occasions working in both Colombia and Ecuador. Together we have described several new Araceae and are working on many more (Croat, Scherberich & Ferry, 2005; Croat, Scherberich, Ferry & Mora, 2012). David is an excellent photographer and I often use his photos in other publications. He was born and raised in Colmar, in Alsace Province, attended the School of Horticulture and Landscape of Roville-aux-Chênes and speaks several foreign languages fluently. He has botanized also in China and in Madagascar. *Philodendron scherberichii* Croat & Mora is named in his honor. Because of David's experience and knowledge, I have named him the Head of Scientific Affairs representing Lyon Botanical Garden in the Aroid Research Group.

### ☀ Tatiana Simon:

Tatiana was a Russian immigrant who volunteered briefly in our program before she got a job with Washington University. Still she did a very good job with the species she described, several new species of *Anthurium* sect. *Belolochium* and two of these species are being published as new (Croat & Simon, in prep).

### ☀ Jocelyn Tsai:

A student from Washington University at the time, Jocelyn spent most of the summer sorting out massive numbers of undetermined species of *Anthurium* sect. *Porphyrochitonium*. This group is one of the most species-rich and poorly known of all sections. Many of the species that she separated have proven to be new species and have been subsequently described. Jocelyn Tsai will be co-author of a large preliminary revision of sect. *Porphyrochitonium* (Croat et al., in press).

### ☀ Jay Vannini:



The newest member of our group is an old friend and plantsman who is familiar with a great deal of the Neotropics. Jay spent much of his adult life in Guatemala (39 years from 1975 till 2014) where he was in the business of procuring money for businesses. In his spare time, he traveled the jungles of Guatemala and adjacent countries. His wife works for the State Department; she and Jay now live in Redwood Shores near San Francisco where Jay has a plant business. Jay is one of the best naturalists in Central America, familiar with both plants and animals, especially in Guatemala. He was active in Guatemalan natural resources conservation from 1986 through 1994, co-founder of the Guatemalan Conservation Trust (FCG) in 1990, and published a number of articles on biodiversity and management of tropical agroecosystems. Together with Croat, he published a study of the Araceae of Guatemala (Croat & Vannini, 2012). Again, in collaboration they have published papers on several species (Croat, Castillo-Mont & Vannini, 2007; Croat & Vannini, 2010). As a collector, grower and breeder of aroids from many areas he benefitted by his knowledge of Central American aroids that was both broad and deep. His website, <http://www.exoticaesotERICA.com>, frequently posts articles on a variety of tropical natural history themed subjects as well as on Neotropical aroids in nature and in advanced cultivation and is a popular reference source for many in the aroid community. He grows many of the aroids that we are studying and because of his extensive living collection, he often knows more about the biology of the plants than anyone else does. Jay and I regularly discuss and publish new species. Jay participates by contributing material, specimens and information about Araceae, most recently information about new species from Guatemala and information about other species from Central America.

### ☀ **Gregory Ward:**

Greg is a public horticulturist/arborist and an aroid enthusiast who has trained and worked at Longwood Gardens, PA. He has been an active IAS member since 2013 and has served on the Board of Directors of the IAS, serving also as the organizer for Saturday Afternoon Speaker Series at Fairchild Gardens, FL, during the IAS Show and Sale in Miami. Greg described a number of new species of *Philodendron* (Croat & Ward, in prep.). He works in the St. Louis area as grounds supervisor to the University of Missouri-St. Louis where he manages over 200 acres.

### ☀ **Jonathan Watt:**



As a former Garden employee and a skilled horticulturist, Jonathan had special talents, already understanding the morphological characters of plants and the natural variations between species so he was easy to train as a Plant Descriptor. Jonathan is working with me on a Revision of *Anthurium* sect. *Xialophyllum* and had made significant contributions in describing *Anthurium* before moving to the Houston area to be with his family. His work is memorialized by *Anthurium wattii* Croat & D. C. Bay. Jonathan was ground superintendent at a Boeing facility in north St. Louis and his wife, Jennifer was an artist who graduated from Fontbonne College in St. Louis. He was one of the very few volunteers (the other being Xavier Delannay) who participated with me in the field, going with me to Panamá and Colombia in January and February of 1990, working primarily at the rich lowland site of Bajo Calima.

### ☀ **David Weber:**

A retired biologist from Granite City, IL, and former employee of the Public Health Service, David was engaged in research of sea grasses which protect the erosion of our seashores. He retired in 1995 as a Commander. He served as a Research Biologist and Senior Scientist, in Gulf Breeze, FL, Program Coordinator for Ecological Effects with the U.S. Environmental Protection Agency in Washington, D.C., a Plant Pathologist with the Environmental Protection Agency in Corvallis, OR, in addition to Raleigh, NC. He graduated from Eastern Illinois University and from North Carolina State University with a Ph.D. in Plant Pathology. After moving back to St. Louis, he became a volunteer at the Missouri Botanical Garden serving in various departments. In our program, Dr. Weber described new species in *Anthurium* and *Philodendron*. David was suffering from Hodgkins Disease even while he was working with me. He came to work even after treatment of chemotherapy and was seemingly unaffected by this usually crippling treatment. It finally took his life on March 31, 2007. David is honored by *Anthurium davidweberi* Croat.

### ☀ **Edward Wilhelm:**

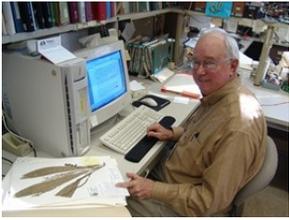


Ed worked on describing new species of *Philodendron* in 2014. He volunteered to work for us during his free time because he loves plants. Ed has his PhD in plant genetics and did his PhD research at the National Institute of Agricultural Botany in the United Kingdom. He now lives in

### ☀ **Whitney Wodstrchill:**

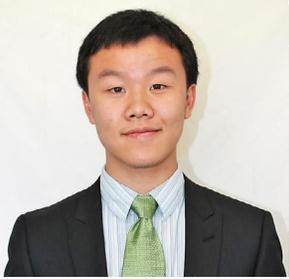
During the summer of 2010, Whitney was working on *Anthurium* descriptions with sect. *Cardiolonchium*, as was Keith Lee so they co-published a paper together (Croat, Lee, Wodstrchill & Kostelac, 2011).

## ☀ David Wolfersberger:



David, a native of Ferguson near St. Louis, spent his entire career as a Chemical Engineer, working for DuPont, Mallinckrodt, and for 25 years with Monsanto. He worked for us for only about a year but he was very productive and published a paper with nine new species of *Anthurium* (Croat, Wolfersberger & Kostelac, 2008). David and his wife, Kathleen are retired and living in Ocala, Florida, where he works on his stamp collecting and wood carving.

## ☀ Jason Zhang:



This young man is the son of one of our staff members, Libing Zhang, who is a fern specialist. Jason was a high school student at the time and wanted to do a project during his vacation period. He turned out to be so brilliant that my project to describe a few new species of 3-lobed *Philodendron* species from the area around Iquitos turned into a revision of 62 species of 3-lobed species from throughout the Neotropics, 34 of which are new to science (Croat, Zhang & Mora, in prep.). Jason has subsequently gone on to finish his Bachelor's Degree at Harvard University. Currently Jason is working with companies in a variety of industries including FinTech, software, internet, consumer, and retail.



## Tropicos Data Entry

The Tropicos Database is now the world's largest plant database website and is used throughout the world. Tropicos (as of April 2020) has 1.33 million plant names represented by 4.87 million herbarium specimens as well as 685,000 digital images as well as 150,000 references from 52,600 different publications. It is an essential reference tool for scientists and the general public worldwide. Much of the work of volunteers affects this database and it is an essential process that must be done any time a name is changed. In addition to adding new determinations, it is also necessary to enter new names into the Tropicos database. Volunteers who have worked on this huge project include:

## ☀ Dianne Grubbs, Marika Jakbovska, Ryan Ann Mertz, Denise Morgan, Torban Pace and Linda Rigger.

Denise Morgan later joined the crew mounting plants.

## ☀ Ken and Sharon Clemens:

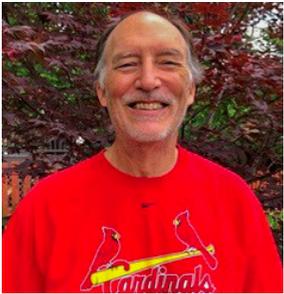


This husband and wife team worked on data entry in Tropicos and always arrived very early so we had to have work assignments ready for them the day before. Sharon was a very fast typist and knew the Tropicos program well, so was responsible for specimens that required the use of a special bar code scanner. She entered much data, especially for the Sidney McDaniel Project in which thousands of specimens were donated to the Garden. Ken made a huge contribution by scanning type specimens from the herbarium and spent a lot of time searching for missing specimens in the herbarium that were part of an overdue loan.

### ☀ **Jim Miller:**

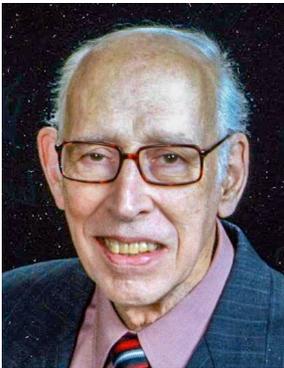
Jim was an Industrial Psychologist working for Southwestern Bell and was recruited by Bob Hormell. He is responsible for entering all new determinations into Tropicos each week. Jim also enters data from images of herbarium specimens acquired from other institutions.

### ☀ **John Roman:**



John has taken over the role of “name cop” after the death of Al Rossel. This involves dealing with all newly proposed names and newly published names. He adds each new diagnosis to the New Species to be Described document for all new species names being generated in our program as well as those of other botanists throughout the world. This involves adding to the List of Diagnoses, entering the new name and its section into Tropicos and adding the new name to the respective spreadsheet of the genus involved. These measures, in addition to those of Barbara Altenbernd who works with filing hard copy diagnoses to a card file along with images of the type specimens, insures that we are not duplicating new scientific names.

### ☀ **Allan J. Rossel:**



The late Al Rossel was a lifelong employee of IBM and initially volunteered for us to do data entry so we had him learn to use the Tropicos records system and to enter new determinations. We soon learned that we did not really need to get IT involved with our computer problems because Al always had the solution. He soon learned how to use Lucid, our program with which we determine species in large genera like Anthurium and Philodendron. He downloaded a copy of the program, learned all about it and was soon able to help us with problems we had with its use. He learned how to download descriptions, then wrote a program to clean up the downloads and make them more presentable. Finally, he came to be the “name cop” who was responsible for making sure that all new names were entered into Tropicos and that there were no duplications. He also monitored the removal of names no longer considered good or names that we converted to still other new names. It was a large and complex responsibility since there are hundreds of new names involved. Al and his wife Joyce (also a MBG volunteer in the library) lived in Waterloo, Illinois and had two daughters living in other cities. After 4 years on the job, Al developed cancer and though he continued for about a year, he eventually succumbed to the disease on Aug. 21, 2016. *Anthurium rosselianum* Croat (Croat, 2018) is named in his honor.

### ☀ **Jocelyn Tsai:**

A student from Washington University at the time, Jocelyn spent most of the summer sorting out massive numbers of undetermined species of *Anthurium* sect. *Porphyrochitonium*. This group is one of the most species-rich and poorly known of all sections. Many of the species that she separated have proven to be new species and have been subsequently described. Jocelyn Tsai will be co-author of a large preliminary revision of sect. *Porphyrochitonium* (Croat et al., in press).

### ☀ **Robyn Wilkerson:**

A resident of nearby Fenton, Robyn proved to be a very good editor, spent a lot of time editing the *Monstera* of Central America treatment, and took on the detailed job of going through the entire *Philodendron* Revision of Central America that we lost but regained only from a scanned version of the revision. Since the scanned version had many errors, this was a tedious but essential job. Robyn worked at Logan College of Chiropractic Medicine for 27 years and had her own practice. There she edited the College Academic Catalog, Student Handbook and Faculty Handbook so she already had a lot of experience with editing. Having grown up among farmers, she had a keen interest in gardening and after retiring; she began volunteering and opted to work with us in the Aroid Research Group. She is still involved with the Rose Society of Greater St. Louis, gardening at her home and enjoying her family and her three grandchildren.



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## **Greenhouse Operations**

Work in the Aroid Greenhouse is varied with some volunteers helping with the care of the plants, watering, weeding and repotting of plants, while others are more associated with direct research on the plants. Edwina Medlock, mentioned below performed research with cross-pollination of *Anthurium* while others photographed plants during their flowering phase to document flowering behavior and phenology. Our research collection is under the care of Emily Colletti who has worked a total of 20 years with the aroid collection. For a number of years when Emily was raising her family, the Greenhouse was under the control of Petra Schmidt, Kathy Upton and Cheryl Newman. Petra moved from the Greenhouse to work directly for me as my Research Assistant for a number of years and then left the Garden to work for Tony Avent at the Juniper Level Botanical Garden.

### ☀ **Cynthia Baudendistel:**

One of the Master Gardeners, Cynthia began volunteering in December 2019 and helps Emily keep the Greenhouse functioning properly and efficiently.

### ☀ **Rudy Bodenschatz:**

A retired industrial worker, Rudy worked two days a week in the Greenhouse doing many tasks, removing dead or cut parts to the compost heap or the trash dumpster, weeding and preening plant collections, scraping dirty pots before delivering them to the pot shed, watering plants regularly and did general cleaning. He was devoted to his work and was very reliable for 9 years before moving to Jackson, Missouri near Cape Girardeau.

### ☀ **Erin Garner:**

Erin was a college student that took photos and made vouchers of the plants she photographed. While she worked for only about 6 months, she did a very good job and took many pictures.

### ☀ **Pamela Hardy:**

Another of the photographers, Pam worked for us for more than a year and took excellent pictures.

### ☀ **Larrie Jankowski:**



Larrie along with her husband Chet both volunteer for the Aroid Research Group. Larrie has worked on a big photograph-labeling mission as a part of the OPUS project and is currently the plant photographer in the Aroid Greenhouse.

### ☀ **Edwina Medlock:**

A retired high school science teacher, Edwina spent countless hours in the Greenhouse pollinating *Anthurium*. Initially she was interested in the phytotaxy of leaves, especially if they unrolled to the left or to the right when it was emerging from bud, but we eventually came to realize there was no consistency at all. Since I was very interested in getting fruit development on new species so that we would know the characteristics of the berry (color, shape, number of seeds), I asked her to always look for possible plants which we could use for pollination. Edwina kept excellent records and later we were able to use her research to study the outcome of this breeding program. In conjunction with Dr. Richard Sheffer at the University of Indiana, Gary, IN who had a significant number of duplicates from the MO collections. He had also been carrying out breeding studies so we concluded that most species within a given section were capable of cross-pollinating but that this rarely ever happened when cross-pollinating plants in different sections. We also discovered that *Anthurium* sect. *Pachyneurium* from Central America would cross as would those of South America but it was difficult to make crosses between those of Central America and South America even when they closely resembled each other.

### ☀ **Kay Mattingly:**

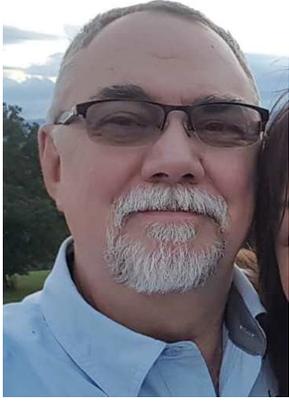


Kay was one of the photographers who came each week to take pictures and to make herbarium vouchers in the Greenhouses. She valiantly continued to work even after suffering from breast cancer. She eventually died from this disease.

### ☀ **Spencer Miller:**

Spencer was a young man who was very devoted to the study of aroids and helped Emily Colletti, the Greenhouse Manager for a few months before moving on.

### ☀ **Randy Headrick:**



Randy was particularly ambitious and took thousands of pictures. He downloaded his images onto the H-drive in the Lehmann Building and often consulted with me to find out more about collections. He was even responsible for discovering a new species in the Greenhouse (or at least making it available to me so that I would realize it was new). While reviewing his images labeled *Anthurium dolichostachyum*, I realized that one of his plants possessed a red spadix and investigations proved this to be a new species. It will be named *Anthurium headrickii* Croat in his honor.

### ☀ **Rick Weaver:**

Rick regularly helps with the *Amorphophallus titanium* bloomings (along with several other docents that volunteer in Education) during those times when this exciting big flower emerges and attracts thousands of visitors.

### ☀ **Cheryl Erman:**

Another of the Master Gardeners who volunteered in 2019 and helps Emily (along with her friend Cynthia Baudendistel) with general maintenance of the Greenhouse.

### ☀ **Robbie Wild:**

Robbie was a high school student who volunteered one summer, working mostly in the Greenhouse but also with some clerical work in the office.

### ☀ **Amanda Colletti and Andrea Glogovac:**

Both of these young women are Emily Colletti's daughters and work at each big flowering event for *Amorphophallus titanium* when they bloom. Emily has been very successful in recent years to get these big smelly brutes to do their astounding



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**Special Projects:** Some projects are special and of limited duration.

## **Separation of the IBE Herbarium Collections**

One such project was the dispersing of the Sidney McDaniel Herbarium from the Institute of Botanical Exploration (IBE) in Starkville, Mississippi. Sidney McDaniel had a large storage building full of unmounted specimens and eventually took up my offer to help him distribute the duplicates after having a stroke. I rented trucks and in three separate loads transported

### ☀ **Gene De Bolt:**

Gene was one of earliest of the volunteers who worked with the separation of the McDaniel Herbarium.

### ☀ **Cathie Stricker:**

Cathie worked on the distribution of the McDaniel Herbarium.

### ☀ **Alexander Zhloznyak:**

Alex was one of the volunteers involved with this big distribution of McDaniel Herbarium material. Alex works in the Optical Radiology Laboratory at Washington University and has worked at the university since 1980.

# Labelling of Digitized Images of Seattle Filmworks Pictures

This project was a major undertaking with the need to label more than 100 rolls of film, which had been processed as slides and prints but later digitized. The digital images have the advantage of being instantly uploaded but only if they are first digitally labeled. This required sending the slides to volunteers and sending the accompanying notes for each slide. Volunteers then went through the slides and the digital images simultaneously to add the digital label. A number of individuals took part in this work.

☀ **Linda Heinicke, Harry Hendrix and Marni Portner**

all active in this labeling of digital images.



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