



Oh what a difference a year makes. In the fall of 2017, Dr. Donglin Zhang (UGA), Mark Weathington (JCRA Raleigh, NC) and I found ourselves hiking through one of the richest valleys any of us had ever been in. So it stands to reason that we would want to return after seeing so many “firsts” in fruit while we had been there the year before. One year later, we found ourselves bound for Moon Valley once again, seething with anticipation. We arrived at the entrance to the valley just at dusk. Before long, Sun and Little Sun (our host and his younger relative) came bouncing up the road in their work truck to greet us. After a brief welcome, we followed close behind as they lead us deep into the valley to their home. This was the same road we used last year to access the valley, but something was different. The road follows the river drainage all the way up the valley, but where there was a raging river last year was now a dry river bed. When we arrived at the small farm that we would call home for the next few days, the couple told Donglin that not only had there been a very late spring freeze in the valley, but they had very little rain all season which had caused the river to almost run dry. Not good. It was too late for us to even begin to assess the situation that evening so we retired to our rooms and began to prepare for our outing the next day.



In the morning, the weather seemed nice and we all had high hopes of hiking into the valley and finding areas that had perhaps been protected from the frost or had received enough moisture during the rainy season to produce viable seed. However, it was not to be. The seed / fruit was so scarce that we all began to wonder how the animals in the forest could survive on so little when the perfect storm of late frost and drought curse the land. As we hiked we saw a multitude of genus that were as diverse as they were interesting ranging from the towering Aesculus to the small, but sturdy Orchids that dotted the understory. Many of which we had not stopped to notice last year, perhaps because we were so focused upon moving from one fruiting / flowering plant to the next, we simply skipped over anything that didn't catch our eye. The previous fall (2017) had spoiled us for sure. This year, we were able to find seed on only a handful of interesting plants that managed to withstand the harsh conditions.



Cypripedium sp.



Epipactis mairei

Our original plan was to hike into the valley and spend either one or two nights camping inside depending on how good the collecting was. After hiking for 8 or 9 hours and making less than a dozen solid collections, we were having second thoughts about spending too much time in this area. I think what sealed the deal for all of us is when we arrived at the home (hut) that we were to sleep in for the night. As always, our hosts were incredibly hospitable making a hot meal and tea for us after our long

hike. It had started to rain and we had no tents it turned out....the plan was to stay with these kind folks for a night or two while we surveyed the area. I've stayed in some filthy places in my day, but had we stayed there for the night, it would have shot straight to the top of the list of the filthiest. It was only the second time I have actually seen the old pig sty under the outhouse set up, but there it was. Something you just can't get used to I wouldn't think. As we were mulling around after we finished eating, I noticed Mark looking at his watch, and I hoped he was thinking the same thing I was. Indeed, we were both in favor of hiking back the way we came at a quick pace in order not to burn another day in an area with no seed (and to avoid the nearly 100% chance of getting body lice so soon in the trip). After a very long, nearly 14 mile round trip hike that day, we made it back to our hotel. We all agreed that exhaustion was a small price to pay for being able to sleep in a dry, clean bed. While we had not done all that well with regards to numbers of collections on our first outing, we had made a good decision in leaving Moon Valley early which allowed us to get on the road the next morning in hopes of finding a more suitable location.



Mountains on the border of Gansu and Shaanxi



Exfoliating bark of *Pinus bungeana*

Our next stop was only about a half day drive away as we continued our circuit around the beautiful northwest region of China. Before we left Gansu and as we headed back east into Shaanxi, we wanted to stop along the way and investigate what appeared to be a large forest of *Pinus bungeana*. Unfortunately, we were not there at a good time for collecting ripe seed / cones, but we did get the unique opportunity to hike through an area with some very large Lacebark Pines growing in the wild. Definitely a bucket list moment. We spent the next couple of days in an area called the Liping National Forest Park in the southwest corner of Shaanxi. The weather cooperated perfectly while we walked through the rare and colorful natural diversity that occurs there. Not only was the geography / geology all throughout the park jawdropping, we found ourselves wandering past specimens of *Acer tsinglingense*, *Stewartia shensiensis*, *Rhododendron hypoglaucum*, *Acer robustum* and *Enkianthus* to name a few.



Liping National Forest Park, Shaanxi



Acer tsinglingense



Rhododendron hypoglaucum



Stewartia shensiensis



***Ilex fargesii* (very narrow form)**



Cremastra appendiculata

We finished up our hike in this remarkable park with a rejuvenated sense of hope and accomplishment. Having made good collections in this area, we now needed to move on if we were going to see yet another location in southern Shaanxi before having to head back to Xi'an. This time we would drive a full day to our next stop called the Tianshu Canyon located in the Daba mountain chain.



Side valley late in the day in the Daba mountains.



Epimedium aff. *wushanensis*



Liparis sp.

After our long drive, we finally reached a small town very nearby the mountain we wanted to visit. Since we started early that morning, we arrived at our hotel by 3 pm and decided to use the rest of the afternoon to try and scout out a good location or two for the next day. Very quickly we saw that while there were beautiful mountains all around us, they had been completely clear cut not so long ago. The locals insisted that the area was untouched with virgin forest all around, but we could easily see otherwise. The sun was still up, so we pressed on. After 30-45 minutes of driving we finally were able to get out of the valley that was so badly deforested and begin to see glimpses of very nice patches of forest. We decided to just choose a side road that looked like it led somewhere interesting to pull off and have a look. We drove down the dirt road as far as we could, then we walked. Around the first corner we encountered a construction crew that was trying to rebuild a concrete road that had completely washed out only weeks before. There were still sections of thick mud on some parts of the road somehow left intact. We carefully walked on the wooden boards along the edge of the road making sure not to step into the freshly poured concrete. Work came to a screeching halt while we walked through while everyone stared and, I'm sure, wondered what in the world we were doing way out there. Before the sun set on us that afternoon, we were rewarded for our persistence in finding quite a few interesting herbaceous plants in seed. Two worth mentioning were a very large and spiny foliated *Epimedium* that closely resembles *E. wushanense* (but Darrell Probst, Epi Guru, says no) and a nice looking terrestrial orchid genus called *Liparis* (not sure of the species yet). All in all, it was a very nice afternoon. One which we all hoped was a sign of positive things to come



Fall color beginning to appear in the Tianshu Canyon.

The next morning, we arrived at the official entrance to Tianshu Canyon just as it was opening. It was a little chilly that morning and there were only a handful of people milling around the visitor center trying to decide if they wanted to brave the open-air bus ride into the canyon. Since this was our only option if we wanted to see what was inside (they would not let us just walk in), our small group hopped on the bus and took off. We rode the bus to the end of the line which was deep inside the park where they let us out, and we were allowed to basically walk back. We were the only ones on the bus, so we exited and began our slow march through this beautiful area. Immediately, we began seeing interesting plants such as *Aucuba* aff. *albopunctifolia*, *Paris*, *Paeonia*, *Arisaema*, multiple terrestrial orchid species, *Asarum*, *Rhododendron* and *Dysosma* were all over the surrounding cliffs.



***Paeonia* sp.**



***Asarum* sp.**



Aucuba* aff. *albopunctifolia



After spending a few days in the Tianshu Canyon, it was time for Mark and I to fly back to Shanghai while Donglin took the train to Hunan to visit with his mother for a few days. Mark and I only had about 4 days left in China, but we wanted to make a quick visit down to the Tianmu Mountains in Zhejiang province. Upon our arrival into Shanghai, we were picked up by our old friend Liu Gang who is a nurseryman in the area, but he also works very closely with Chenshan Botanical Garden as well as Shanghai Botanical Garden. The plan was to pick up another friend

from the Shanghai Botanical Garden who specializes in Iris breeding, Dr. Xiao, and her student, Yu. Once we were all together, we made the 4 hour drive south to one of the highest points in the Tianmu Mountains. There is a very rare Iris that occurs only in the Tianmu range called Iris proantha and that is what we hoped to find on our quick trip down south.

Liu said he had arranged accommodations for us through a friend of his who had just built a hotel high in the mountains. Having traveled with Liu on several occasions, we knew Liu's taste in hotels did not always jive with our own, so we were skeptical what sort of place he had found for us. However, upon arrival, we were relieved to see that the place was very comfortable, and the owner knew a great deal about the surrounding mountains and the plants that grew in them. After dropping our bags in our rooms and a quick cup of tea, we set off on foot to see what we could find while there was still daylight. Within just a few minutes, Liu's friend had taken us directly to a spot where there were many Iris proantha thriving on a dry shaded slope underneath a thicket of timber bamboo. Dr. Xiao had mentioned that she and her team has had a very difficult time growing this plant in cultivation and seeing it in the wild gave her an idea as to why they were so unsuccessful. They were growing it in wet conditions, which it does not like apparently. The Iris actually looks nothing like an Iris at all, but rather some sort of evergreen grass. Even after being shown the plant several times, I still was having trouble identifying it as such. At this point in time, I still have not seen the plant bloom for myself, and I am just hoping Dr. Xiao knows what she is talking about. Time will tell.



Bamboo forest where Iris proantha was growing.



I. proantha (we think???)

Mark, Yu and I continued to walk the road up further into the mountains for the next couple of hours. The forest above us was thick, and we were lamenting the fact that we did not have enough time left in the area to explore it properly. However, when time is short and if there is a road that cuts through the forest, sticking to the road can often be very productive. By cutting into the forest to make the road, sunlight is allowed in which helps to encourage flowering and fruiting while the plants are still part of the understory. Hiking through an old forest with an intact canopy is an amazingly surreal experience, but you cannot see the flowers nor the fruit of these majestic trees because they have shot up toward the sun. So, we decided to follow the road up as far as we could with the light we had left. Along the way we saw more than enough

interesting plants to make us want to visit this area again, perhaps in the spring next time to get an even better idea of what rarities are hiding in those mountains. We saw things such as Podophyllum, Polygonatum, Lithocarpus, Callicarpa, enormous Tricyrtis, Sassafras tzumu, Ilex pedunculosa, Cephalotaxus AND a couple of Green Temple Vipers. I don't mind snakes as long as I can see them before I am too close to them. The Green Temple Viper is bright green in color which makes it very easily seen when it is out in the open, but when it is in its native habitat of cane bamboo this reptile is basically invisible. I very nearly knelt on the one pictured not because he was camouflaged, but because I was so intent on getting a photograph of some plant behind the snake I didn't even see it until Yu screamed at me, nearly giving me a heart attack. We had just seen a smaller one about a half hour earlier that I almost stepped on while trying to look at some other plant, so I decided not to press my luck any further, and I just stuck to the road for the rest of the walk.



Lithocarpus sp.



Green Temple Viper



Yu with giant Tricyrtis.

Mark and I only had a couple of days in the beautiful Tianmushan area on this outing, but we saw many species we had not encountered on our previous trip to a similar area. This mountain range is not huge, but it is well protected with many rare treasures still thriving in their natural habitat. We will be back.

Part II. Hanoi and Dalat, Vietnam December 3-12, 2018



Local climber over 200' off the ground collecting cones of *Pinus krempfii* for us.

As I believe I have mentioned in a previous report, in late June of 2018 I was contacted by my friend and colleague Dr. Van Dzu Nguyen from the Institute of Ecology and Biological Resources (IEBR) branch of the Vietnam Academy of Science concerning a return trip to the Central Highlands area of Vietnam. We had traveled together to this area in the spring of 2018 to try and make contact with the forest rangers who were overseeing the national park that protected the ancient *Pinus krempfii* in Bidoup - Nui Ba National Park. Turns out the rangers were amenable to working with us to collect seed and attempt to establish it in a few botanical gardens in the US. So, we began communicating back and forth to try and

figure out the ideal time to visit these mammoth trees again during their cone producing season. It was decided that early December was the best time, and the tickets were booked. Not wanting to fly all that way just for a few days in the field to collect the Pine seed, I began to try and set up meetings with our friends at Flora and Fauna International (FFI), so we could continue to work out a plan for collaborative efforts of conservation Vietnam. Somewhere along the way, we began to realize that there were a staggering number of rare and endangered orchid species in or near the very same locations we were prioritizing as hot spots for diversity which meant they needed further exploration. While ABG does have the largest documented collection of species Orchids in the world, I myself know very little about them. I decided to invite Dr. Peter Zale from Longwood Gardens along for these meetings since he had mentioned several times that he was interested in working in Vietnam, and I already knew he was a very keen plantsman with a special interest in Orchids. With Peter on the team, I felt like we were ready to have serious discussions about conservation and collaboration in the field with FFI and IEBR. And that's exactly what we did.

It was a fast and furious trip, but Peter and I arrived at nearly the same time into Hanoi so we were able to easily gather our gear and head into town to meet Dzu. That very afternoon, Dzu was picking up our signed permits which allowed us to work and collect seed down south in Dalat where the *Pinus krempfii* are located. He had suggested to me a week earlier that a good bottle of whiskey never hurts when it comes time to seal the deal, so I needed to meet up with him to hand that off, and we would be ready to fly down south in two days. We first needed to meet with our friends at FFI and then the director of IEBR to ensure we were all on the same page with regards to collecting and sharing material and information with all parties involved. The next morning, we had a remarkably productive and positive meeting with the country director of FFI for Vietnam as well as two of their researchers who are working in the areas we have shown interest in helping to protect. As it turns out, the three locations we have identified in the north are very near areas where FFI is already working to protect the Snub Nosed Gibbon and its habitat. In this meeting, it was decided that we were all in agreement as to what needs to be done and that a memorandum of understanding would be created between the five parties (FFI, IEBR, Global Trees Campaign, ABG and Longwood).

After our morning / lunch meeting with FFI, we went straight over to IEBR to meet the director of the department. The objective of this meeting was to discuss the possibilities of us obtaining CITES level collection and export permits in order to put the most endangered material in ex-situ collections outside of Vietnam as a safeguard. For a preliminary meeting, it went very well. It takes time to develop solid relationships anywhere, but especially in Asia. By the end of the meeting, we had all agreed on some basic collaborative issues, and we have another meeting set up for April 2019 to further discuss how we should proceed with regard to both in-situ and ex-situ conservation. While there is a basic nursery infrastructure in place within the Academy of Science just north of Hanoi, we will need to make some changes / upgrades (installation of a small tissue culture lab, soilless growing media, sufficient shade structures) before we can begin to bring plants down from the northern border areas. Much of this will be discussed and worked through during the next meeting in April. Now that the business side of our trip was successfully behind us it was time to fly down to Dalat to try and fulfill the second goal of our trip...to come home with viable seed of *Pinus krempfii*. The next morning, Peter and I were picked up

and shuttled off to the airport by Dzu and a new friend that I had asked to join us, Dr. Vu Quang Nam who is an expert in Magnoliaceae from the Vietnam National University of Forestry. The hunt was on.

The city of Dalat has become an over-built tourist spot in what is known as the Central Highlands. The weather is absolutely ideal with it never becoming too hot or too cold, so both agriculture and floriculture have seriously set up shop there. We stayed at one of the many small, boutique hotels close to the center of town. There was a lot going on with restaurants, bars and shops of all kinds lining the streets. The next morning we drove through and out of town, then up through the cultivated areas and finally to the protected forest that is home to *Pinus krempfii*. I was once again amazed at just how many cold frames, hot houses, shade structures, etc. are in operation there. There was a small town up in the hills where we pulled over and picked a local guy up. Then we took a few turns and picked up another local guy. These two were to be our climbers for the day. We loaded everyone in, stopped off at the ranger station to pick up our friend from our April scouting trip and continued driving up into the hills until we reached an area we could hike in to find accessible and climbable trees.



Impatiens eberhardtii



***Rhodoleia* sp.**



Nam showing us how to identify *Magnolia bidoupensis*.

The Bidoup Nui Ba Nature Preserve was established in 2004 and is one of the largest in Vietnam. While much of the surrounding area has been cut over and farmed to death, the forest in this park has been well preserved and is remarkably diverse. In 2009 (last IUCN update in this area), the park had 62 vascular plants on the IUCN Red List and was found to be home to 15 of the 33 known conifer species in Vietnam. The park is located in southern Vietnam and quite near the coast, but mountainous surroundings protect the area from temperature extremes. It is named after the two highest peaks around Bidoup (2,287m) and Nui Ba (2,167m). I knew this was a rich area from my previous trip, but I was not expecting to see so many things in flower so late in the season....multiple species of Impatiens, Orchids (both terrestrial and epiphytic), large Rhodoleias, and we had just missed the last of the Magnolias. After a short hike, we began to see the enormous trunks of the trees that we had come to collect. The *Pinus krempfii* in this park have been around for nearly 2,000 years and some have reached a towering 200 feet tall. As with most Pines, the cones are not produced close to the ground or even close to the trunk. Someone was going to have to climb up these trees (whose lowest limbs were 100' off the ground) and shinny out on to the branches so a smaller limb with cones could be cut with a machete and dropped down. This is why we brought our local guys with us, but even they were scratching their heads as to how they should get started. After seeing the trees, they told me it would be 500,000 Vietnamese Dong (~\$20USD) per tree he climbed. I agreed, they were ecstatic, and the climbing ropes came out. First, they tried to climb up a tree with a bare trunk using a rope in hopes they could get to the lowest limb and tie off, but the tree was too large and the distance too great for him to go very far. Then they tried to climb a smaller tree growing next to the Pine thinking that they could then somehow transfer from one to the other at some point, but that proved too dangerous they said. Although considering what these guys were about to do, none of us had seen dangerous yet. Finally, they decided on a tree that had a very old vine growing up the side. One of the climbers had the rope tied to his waist and then used the vine to get footholds as he worked his way up the trunk of the tree. Within minutes, he was up in the canopy. I could not believe his agility while up there. Once he had tied himself off, he began walking out on the biggest branches and cutting off small branches with cones. We were a little late and could tell that the majority of the cones had already opened allowing the seed to be blown out. However, between this tree and one other, our climber was able to get us about 18 green cones before the rain started. After Peter and I manually pried open the cones by hand and extracted any seed there was, we had about 65 that looked good. Once we did the float test, we determined that only 3 of those sank and since then only one has germinated. We have that one small seedling at ABG now, and we're still hopeful that Peter will get germination at Longwood. If not, the harder job of creating the relationship is done. All we have to do is go back and get more seed.



Negotiating the climb.



The first attempt.



Successful attempt. Climber can be seen working his way up in the center of the photo.



Our climber in the canopy of *P.krempfii*. Notice all of the other species growing epiphytically.



Big tree, small cones.



Flattened, mature foliage with cone attached.