White-Flowering *Leuenbergeria lychnidiflora,* Manzanote Cactus Tree

Rarest Mutant Cactus Tree of all Guatemala, Aldea Agua Caliente, Rio Tambor, Zacapa, Guatemala

Photographs by Nicholas Hellmuth and Edwin Solares, FLAAR Mesoamerica, June 21, June 28, July 6, July 7, 2023

FLAAR Reports, FLAAR (USA) and FLAAR Mesoamerica (Guatemala)

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Introduction

The present FLAAR Reports is to show lots of the close-up photos of the white flowers of the two rare *Leuenbergeria lychnidiflora* manzanote mutants on the top of the steep cliff overlooking the Rio Tambor. In 2023, most botanical databases still used the earlier accepted name *Pereskia lychnidiflora.*

These photos were taken by Nicholas Hellmuth with his iPhone 14 Pro Max on June 28, 2023 and on July 6 and 7, 2023. Although the manzanote trees can continue to bloom into August, it is late June and early July that seem to have the most flowers. On our May 19-May 20 field trip of 2025 only 1% of orange-flowering manzanote trees had flowers. Curiously, both of the white-flowering cactus trees had flowers on May 20th. We show the year 2025 white flowers in a separate FLAAR Reports—the present FLAAR Reports is for June and July 2023.

The white flowers of both adjacent *Leuenbergeria lychnidiflora cactus* trees are staminate, suggested by the discovery of Laia Haurie in 2024. These white flowers attracted several different kinds of pollinators—more than just bees. We show these pollinators in a separate FLAAR Reports on wasp and bee pollinators of manzanote flowers.

Fig. 1.

Fig. 2.

An insect on one of the flowers. 10:50am is a good time of day if you want to see fresh flowers.

Notice how many unopened flower buds are growing. Plus you can see several dark, black, wilted flowers from previous days.

Fig. 3.

10:50am on July 7, 2023.

Lots of pollinators on these male flowers—both the two white-flowering *Leuenbergeria lychnidiflora* trees are male.

Fig. 4.

One flower is open and LOTS of other buds will open in following days.

Several wilted flowers from previous days are also visible.

10:38am, July 7, 2023.

Fig. 5.

10:37am

July 7, 2023.

LOTS of buds still to open later in July, plus there is a wilted flower from previous days.

Fig. 6, a and b.

10:37am for both photos.

Although obviously our goal was to photograph fully opened flowers, it is also helpful to photograph wilting flowers from previous days. Timelapse would be very helpful but that requires staying in front of one tree an entire day.

Fig. 7. 10:36am, July 7, 2023. A flower that wilted a day or so before we arrived.

Obviously we all photograph the flower when it is open, but it would be helpful to show the sequence from the wilting flower and gradual formation of the seed pod. But no seed pods on a male tree such as both white-flowering ones. Only a female tree will produce fruits that turn into seed pods. To show the sequence of wilting obviously would require several weeks of field work, but at least here you can see a wilted flower in the middle and several buds (upper right and lower right).

During their 3-week field trip in August 2024, Bunkenburg and Haurie observed that “At 5pm the flowers were already closed, even though there was still bright sun.” (2025: 56). You can see the dark rust-colored brown wilted flower in their Fig. 5.

Fig. 8.

Is this a flower that wilted the previous day?

To the right is another wilted flower of the same color.

I estimate that the “white” flowers gradually turn light brown as they age in the afternoon.

10:36am, July 7, 2023

Fig. 9.

10:36am.

If you want to do a timelapse of the opening of the flowers you should start at least by 8am. But it takes time to get from base camp to where the white flowering manzanote are ready to open.

Since we prefer to photograph the flower when it is “open” we tended to start at about 10:30am, and photograph to about 1:30pm. We bring our lunch with us in the 4x4 pickup. You can reach here in any size or shape of car but our field trip vehicle is a double-cabin VW Amarok. In previous years we would rent a Mazda or Mitsubishi double-cabin pickup truck from InterAmerican Car Rental, but it is significantly more comfortable to have a VW—since there is more space for passengers in the back seat. Plus automatic transmission is safer when you need to speed up quickly (not available in most pickup trucks from rental agencies). A nice advantage of renting from InterAmerican is that they would bring the pickup truck to your hotel or office (so you don’t have to go to the airport). And at the end of the field trip they come to get the pickup from your hotel, residence, or office.

Fig. 10.

In blooming season there are hundreds of buds on each manzanote tree.

It will be helpful to accomplish timelapse to show these buds as they start to open.

Fig. 11.

My hobby from 16 years of age and on was cactus plants. Every year I would see them all across Texas and northern Mexico as I headed by bus and train in the 1960's to Maya ruins in Chiapas, Yucatan, and Campeche. Then being in a 2nd class bus from Oaxaca to the Guatemalan border you can see lots more cacti south of Oaxaca.

I had seen manzanote cactus during the many months of many years driving from Guatemala City to map Yaxha and Nakum. But it was in 2019-2020 that I noticed that manzanote was a cactus tree--when we drove dozens of times to Rio Dulce and Puerto Barrios to accomplish flora, fauna and bio-diverse ecosystem field work in Izabal, the Caribbean area of Guatemala. No cactus there, but lots when you drive through Zacapa to reach Izabal..

Fig. 12.

At 2:42pm (July 6, 2023) you can see that this manzanote cactus flower is completely open.

What would be helpful to show by timelapse is not only how the flower opens, but how the flower slightly changes color as it gets ready to fold back up in the late afternoon. So we need to photograph the timelapse until at least after 4pm.

Fig. 13.

Fig. 14.

July 6, 2023.

The thick leaves are bright green many months of the year.

Fig. 15.

View from the side.

Lots of buds have black remains of wilted flowers. Lots of other buds will open all July and into August.

There are so many leaves that you don’t often see the long thin spines (at bottom left).

Fig. 16.

2:31pm, July 6, 2023.

Lots of buds will continue to produce flowers most of July. So would be helpful for a botanist to return in the last week of July.

Fig. 17.

Fig. 18.

Fig. 19.

The ring of bright white color is typical of these flowers of the two mutant manzanote trees.

All these photos are with an iPhone 14 Pro Max. With an iPhone you don’t need to set up a tripod for every photo. But to do timelapse sequence, you need a tripod.

Fig. 20.

Now you can see that some of the spines are very long. They stick out at all angles, but rarely straight upwards.

Fig. 21.

Closer view of these needle-sharp spines.

Fig. 22.

The black material is most likely rotten flowers.

The green pods will open in future days or weeks. The tiny pod at the lower right will open later.

The dirty-yellow pods—are these beginning to rot? Since this is a male tree there will not be any fruit produced. Only the female trees can do that, and both the mutant white-flowered manzanote trees are male. So you can only “reproduce them” with branches. Now that the larger of the two trees was blown down in a wind storm in mid-May, 2025, we brought lots of fallen twigs back to the Heloderma nature reserve area for Gilberto Salazar to plant them. We have two planted in the FLAAR Ethnobotanical Research Garden in Guatemala City. Both are still alive. We are curious whether they will sprout roots. We have several twigs to donate to the botanical garden.

Fig. 23.

2:33pm, July 6, 2023.

Hellmuth is standing up on a high ladder so he can look down so you can see the opened flowers. If you photograph the same part of the tree from the ground you would see the sides of the flowers—not inside.

All these photos are by Nicholas Hellmuth in 2023 with an iPhone 14 Pro Max. In 2025 we are using an iPhone 15 Pro Max. Next year we will use an iPhone 17 Pro Max.

FLAAR Digital Photo Archive of Flora, Fauna and Biodiverse Ecosystems of Guatemala.

We are preparing a separate FLAAR Reports on aerial views of the white manzanote cactus trees from drone photos by Haniel Lopez, using the FLAAR drone. So far we have found photos from July 6 and July 7, 2023. Haniel has sent us aerial photos from the drone on June 21, 2023 (the day of discovery of the white variant) so are publishing these. With over 30 TERAbytes of digital photos of flora, fauna and biodiverse ecosystems it's not easy to find folders from one day in one location.

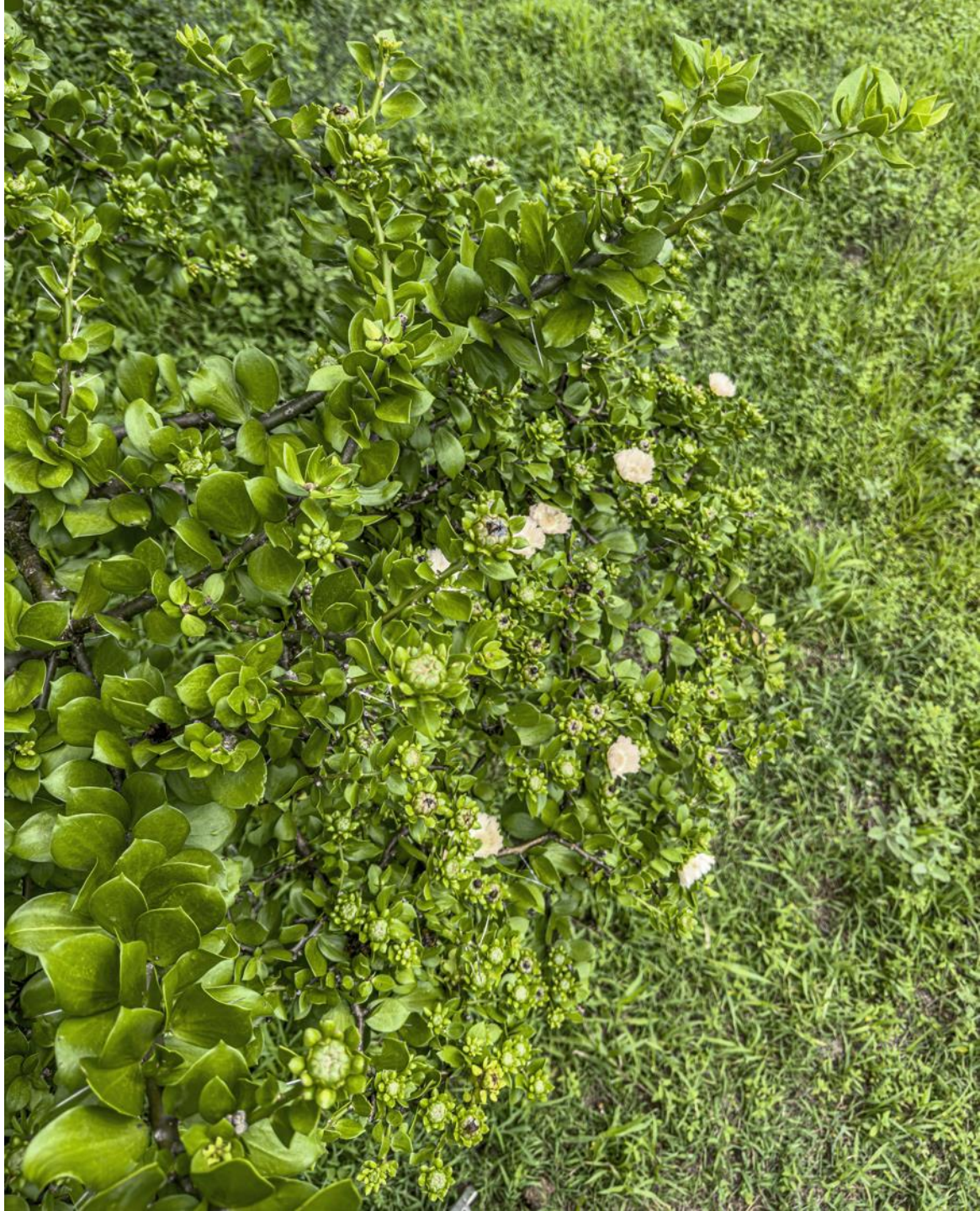

Fig. 24, a and b.

2:34pm at the right, 2:35pm at the left.

Notice the bright pure white in a circle but then the petals are off-white, faintly dusty pink or whitish brown color.

Would be interesting to count the petals and sepals (and see what color the sepals are).

Fig. 25.

2:21pm, July 6, photo by Edwin Solares.

Sony Alpha 1 camera with Sony lens: FE 90mm F2.8 Macro G OSS.

The pure white area remains pure white but the upper part of the petals are turning off-white light-brown.

Fig. 26.

2:18pm, July 6, 2023. From late June into first weeks of July I estimate that most manzanote trees of Zacapa are literally filled with flowers (even though each flower lasts only one day).

Fig. 27.

2:16 pm, July 6, 2023, photo by Edwin Solares.

Sony Alpha 1 camera with Sony lens: FE 90mm F2.8 Macro G OSS

Lots of unopened buds but lots of black wilting flower masses on top of the wilting former buds that had bloomed in previous days.

Fig. 28.

2:16 pm, July 6, 2023.

Fig. 29.

2:15 pm, July 6, 2023.

Fig. 30,a. Orange manzanote flower, 12:32pm, July 6, 2023.

Fig. 30, b. White flower of manzanote, 10:29am, July 7, 2023.

Both these flowers are male (based on discovery of Laia Haurie (Bunkenburg and Haurie 2025: Figures 3, 4 and 8).

Fig. 31.

1:49pm, July 6, 2023.

This flower’s petals are not as widely spread as other white manzanote flowers. But at 1:49pm it is unlikely that it is still opening—and also too early for it to be beginning to close.

Fig. 32.

Probably the same flower as on previous page, but at a different angle.

1:49pm, July 6, 2023.

Fig. 33.

At this angle of view the bright white ring of color is not as visible. Plus the right side of the flower is in the shade.

1:48pm, July 6, 2023.

Fig. 34.

Here you can see what I estimate are green sepals.

1:48pm, July 6, 2023.

This is a closeup view, the larger view is in the next photograph.

Fig. 35.

Lots of long needle-thin spines.

The leaves are bright green even at the height of the dry season.

But if I remember properly, there is a month or so with few or no leaves and you can see hundreds of fruits.

Bunkenburg and Haurie (2025: 55-56), citing Leuenberger (1986) reports that *L. lychnidiflora* flowers from June to October, bears fruit from September to January and is without leaves from January-February to April.

So would be great to drive through El Progreso and Zacapa to photograph areas with lots of manzanote without leaves but with lots of fruits. This could also document how many female trees exist, because so far the vast majority of flowers are of male trees (that do not produce fruits). Keeping in mind you would need to check whether Leuenberger (1986) was documenting the months for this cactus in Mexico or in Guatemala.

Gilberto Salazar was with us in May 2025 and also in summer 2023, and he recounted the history of how the FLAAR Mesoamerica team were the first in the world to notice a manzanote tree with white flowers. There are thousands of these trees in the bosque seco area of El Progreso, Zacapa, and Chiquimula (and outside Guatemala City and elsewhere)—but all have only orange flowersm plus elsewhere in Mesoamerica. To our knowledge, aldea Aqua Caliente, Rio Tambor, Zacapa, is the only area of manzanote trees yet documented with white flowers. Two of them are next to each other—the second tree has only tall branches so requires a drone or a tall ladder to see its white flowers.

Gilberto said that the FLAAR team of 2023 was piloting the drone from the concrete bridge across Rio Tambor. Gilberto said that they were focusing on photographing wild native white *Plumeria* flowers (flor de mayo, flor de la cruz, frangipani). Haniel Lopez was piloting the FLAAR drone, a Mavic 3 model—this was summer 2023. Haniel called out saying that he had found a white-flowering tree cactus. Gilberto Salazar correctly said "manzanote trees have orange flowers." So then we drove to the top of the hill where the village of Agua Caliente starts (the Rio Tambor, below the bridge, has an area of hot water, hence the name of the aldea "Water Hot"). We turned to the left on a dirt road with large rocks sticking up all over the place. We arrived at the tree and both Salazar and Hellmuth recognized that it was indeed a manzanote tree—but a unique variant that had white flowers. So we photographed as many of the flowers as possible. We posted snapshots on our network of websites, but since we had multiple flora and fauna research projects with CONAP in the Reserva de la Biosfera Maya, RBM, Peten, we did not have time to publish formal FLAAR Reports on this tree.

Then, in 2024, German cactus expert Alexander Bunkenburg and Spanish cactus expert Laia Haurie had Gilberto Salazar as their guide. Obviously Gilberrto took the cactus botanists to this rare white-flowering manzanote tree. As botanists they were very surprised. Gilberto told them a gringo researcher had documented these white flowers the year before. Indeed, Alexander sent emails to us in April 2025, since by then they had seen our posts on-line about this white flower. Then the botanists very kindly sent us their excellent year 2025 scientific article that documented the orange flowers were either male or female. So some trees had only male flowers and other trees had only female flowers. We had not noticed that in 2021 or 2023, nor had Salazar, nor had any cactus specialist that we are aware of.

Since it was Haniel Lopez, Gilberto Salazar, and Nicholas Hellmuth who were the first to find and notice the white-flowering manzanote, and since it was Hellmuth who first published it, we wanted to find and show all our year 2023 photos and make them available to cactus botanists in Guatemala, Mexico, plus other countries where the manzanote is native, and to cactus botanists around the world, especially Alexander Bunkenburg and Laia Haurie.

But, none of the iPhone 14 Pro Max photos from those recent years could be found in our over 30 TERAbytes of photos of flora, fauna and biodiverse ecosystems of Guatemala. The iPhone we had on the previous field trips was an iPhone 14 Pro Max—and we no longer had it in 2025. But on the day before we left on the May 2025 field trip to re-document the white-flowering manzanote cactus, Karla Cho Cu (FLAAR Mesoamerica field trip assistant for many years) found that the old year 2023 photos from previous years of previous iPhone models had actually been copied over to our current iPhone 15 Pro Max. We don't have the iPhone model 16 since it did not offer enough new features to warrant upgrading). That said, we will definitely be getting the iPhone 17 Pro Max when it is available this autumn. In June Norma Cho Cu (FLAAR Mesoamerica) found even more Hellmuth photos on his iPhone.

Now that the giant white-flowering manzanote tree has been blown over by a wind storm, we wanted to show this painful fact of life in a separate special FLAAR Reports and simultaneously prepare the present FLAAR Reports to show all our iPhone close-ups from year 2023.

On May 29, 2025, drone pilot Haniel Lopez, kindly sent his photos of the white-flowering manzanote tree from his aerial photography of July 6 and July 7, 2023 with the FLAAR drone, Mavic 3. We are publishing these photos as a separate FLAAR Reports since otherwise the present file would be too many MB or GB.

Incoming weeks we will also have FLAAR Reports on the orange-flowering manzanote trees. One volume will show a pale-orange variant (most manzanote trees have bright deep-orange flowers). But we have not noticed that one tree we photographed had pale-orange flowers. Is this a another variant?

Fig. 36.

There are flower buds all over the tree. Ten flowers are open on this day, July 6, 2023, at 1:56pm, so about 2 o’clock in the afternoon.

Fig. 37.

1:05 pm, June 28, 2023.

Photo by Edwin Solares, Sony Alpha 1, 90mm Sony macro lens.

Fig. 38.

1:15 pm, June 28, 2023.

Photo by Edwin Solares, Sony Alpha 1, 90mm Sony macro lens.

All these photos are in the FLAAR Digital Photo Archive of Flora, Fauna and Biodiverse Ecosystems of Guatemala.

Fig. 39.

1:16 pm, June 28, 2023.

Photo by Edwin Solares, Sony Alpha 1, 90mm Sony macro lens.

The last week in June was a great time to see tons of manzanote trees in full-flowering mode. Plus when we returned on July 6 and July 7, there were still flowers everywhere.

Would be interesting to see how many flowers were still opening later in July. Bunkenburg and Haurie found some trees still flowering in August 2024, but seemingly more cloud cover in August. The manzanote cactus tree prefers pure sun so the flowers can open and be ready to pose for photographers at 10:30am. We found that earlier in the morning the flowers were not open enough to make good photographs.

Fig. 40.

1:16 pm, June 28, 2023.

Photo by Edwin Solares, Sony Alpha 1, 90mm Sony macro lens.

Fig. 41.

1:04 pm, June 28, 2023.

Photo by Edwin Solares, Sony Alpha 1, 90mm Sony macro lens.

Fig. 42.

Sony Alpha 1 with Sony 200-600 telephoto zoom lens. If you photograph flowers on high branches from the ground you can see only the sides. To see the center you need a drone, or a ladder so you can use a 90mm lens instead of 600mm lens—and you can see the fully-open flower.

Photographed by Edwin Solares, June 21, 2023, 3:35pm.

Fig. 43

Fig. 44. It is now 3:38pm, so it appears that the flower has already begun to close.

June 21, 2023. This was the day that Hanel Lopez, Gilberto Salazar and Nicholas Hellmuth first noticed that this white-flowering tree was a manzanote mutant or variant (with white flowers).

Long thin spines sticking out at many different angles.

Fig. 45. Since this has a straight tree trunk and lots of limbs and branches, I always considered this a tree. But it would help to have 3-dimensional line drawings to show how some vertical sprouts grow straight up—and not out like a branch. So would help for a student to do a thesis on the aspects of this *Leuenbergeria lychnidiflora* cactus that are different than the other native trees that are not cactus.

With respect to the straight thick trunk, in this bosque seco area of Guatemala you can find lots of giant Opuntia and Nopalea cactus plants that have thick trunks. Plus there are giant *Stenocereus pruinosus* cactus all over the fields and slopes—many have thick trunks like a tree—but *Stenocereus pruinosus* don't have diagonal and horizontal limbs and branches that are common on the *Leuenbergeria lychnidiflora*, manzanote cactus tree.

We found an area that had hundreds and hundreds and hundreds of *Leuenbergeria lychnidiflora*, manzanote cactus trees—so there are areas of the bosque seco of Guatemala with *Leuenbergeria lychnidiflora* being the most common tree in that area. I estimate there were almost 600 manzanote cactus on both sides of the highway (mostly on the south side) for many kilometers. With a multi-spectral camera and software on a special multi-spectral drone you could literally map this area and count whether there are 200, 400, or my suggested 600 manzanote trees.

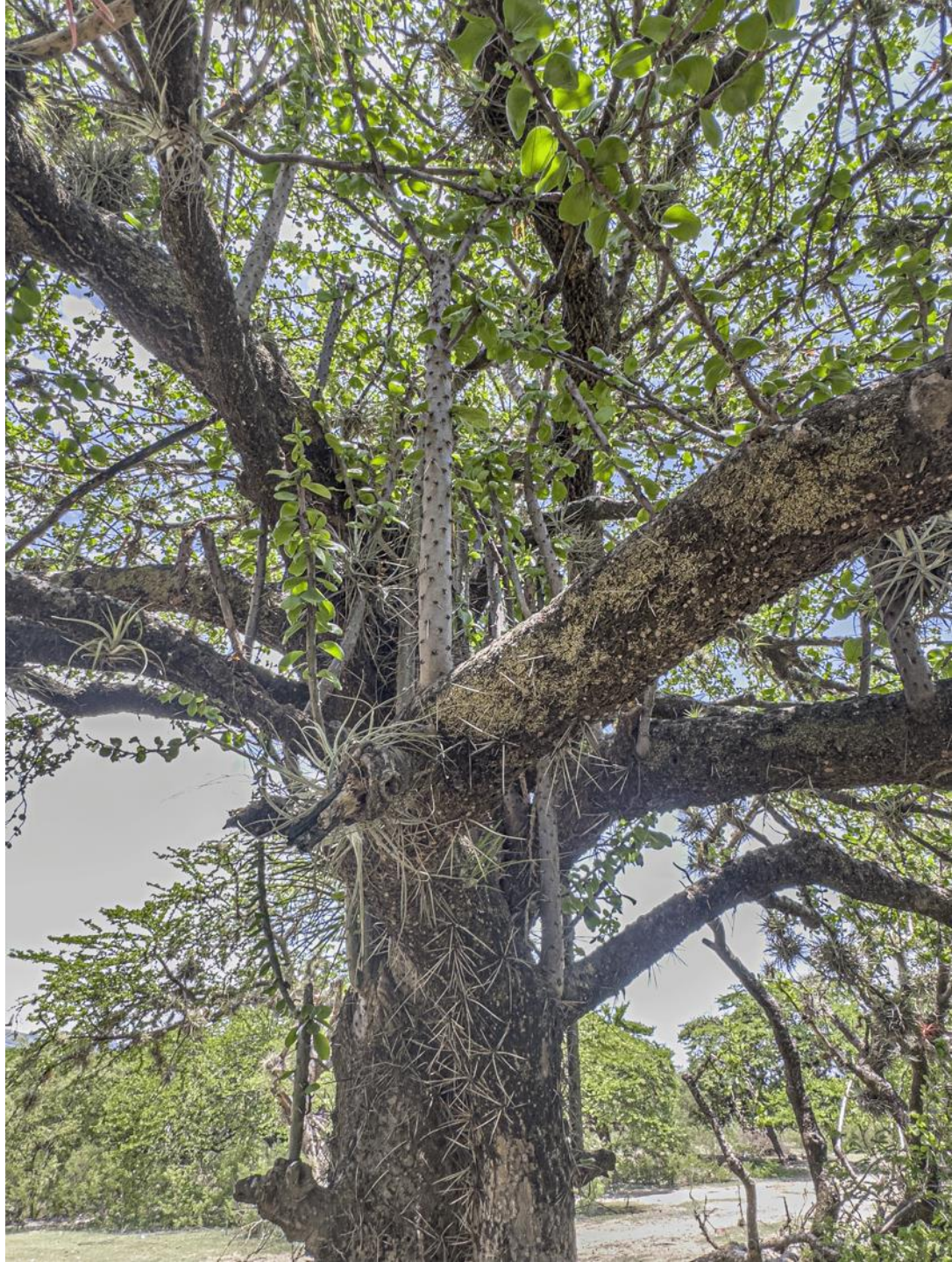

Fig 46, a and b.

The trunk at the right and the fresh green sprout are totally covered with clusters of spines.

A mass of epiphytes is at the left.

July 7, 2023.

Fig. 47, a and b.

Epiphytes in the photo at the left.

Lots of long thin spines, at many angles.

July 7, 2023.

Fig. 48, a and b.

Limbs and branches and twigs all over the place.

The photo at the right shows epiphytes growing directly on the top of the sides of the long needle-like thorns.

July 7, 2023, 11:52am.

Fig. 49, a and b.

Beautiful red topped bromeliads are very happy growing on the branches of this manzanote cactus tree.

Fig. 51. July 6, 2023. This is one of the two mature manzanote cactus trees with white flowers. They are about 15 meters from each other.

If you look carefully you can see abundant white flowers. We bring a folding ladder over 3-meters high so if you stand on the upper step you can have your camera at 4-meters above ground level.

You can also see our drone to the right of the upper part of the tree. If you have a telephoto lens on a tripod on the ground you can only see the side profile of flowers in the upper part of the tree. But if you have an aerial camera on a good-quality drone, you can have the camera looking straight down at the top of the *Leuenbergeria lychnidiflora* flowers.

The photo here was taken from ground level with the iPhone 14 Pro Max that was available in year 2023. In that year almost all botanical databases used the name *Pereskia lychnidiflora*.

This manzanote is growing on the edge of a cattle field. It is very nice that the owner has not chopped down these rare white-flowering cactus trees.

Still Need to Accomplish additional Field Work and Botanical Analysis

If there are two white-flowering *Leuenbergeria lychnidiflora* cactus trees within a few meters of each other, surely more can be found. But the entire area is a cleared cattle field on one side, and a sheer cliff down to the Rio Tambor on the other side. Plus the aldea of Agua Caliente means there is not much original forest remaining on that side.

To scout the whole area you will need the new DJI Mavic 4 Pro, that was released in May 2025. You can order these and get them in Guatemala with the license already approved. Naturally you need to register your drone and ask for permission of park administrators. There are plenty of professional drone pilots that are all experienced aerial photographers. We can share their name(s) and contact info for other botanists and biologists.

I would not recommend trying to bring your own drone into Guatemala because of the cost and time for the paperwork.

Be sure you have LOTS of extra batteries since the hot sun in the May-June-July flowering season literally roasts the drone batteries. We have nine batteries for our Mavic 3 and will be upgrading to the Mavic 4 Pro when funds become available.

I am not a specialist in how an orange flowering can mutate into a white flowering variety, but that definitely needs to be studied. And why this off-white color? Why not red instead of orange, or some other color? Plus, what are the chances that other white-flowering manzanote cactus trees can be found? I estimate that both of the two overlooking the Rio Tambor are male—so they can't reproduce! So how did the second tree evolve? Since the entire adjacent forest was cut down in past decades, the probable "parent tree" is no longer present.

Most of the traditional orange-flowering *Leuenbergeria lychnidiflora* cactus trees are staminate (male). Only a few are pistillate (female). Both are shown in Bunkenburg and Haurie 2025: Figs. 3 and 4.

Introductory Bibliography on the Manzanote Tree, *Leuenbergeria lychnidiflora* (DC.) Lodé especially the unexpected discovery of White Flowers

https://flaar-mesoamerica.org/tag/lychnidiflora/. Blog info on Manzanote cactus from year 2021.

https://flaar-mesoamerica.org/2021/01/22/manzanote-a-special-cacti-from-the-dry-forest/. Photo of trunk, of leaves, of spines on trunk; has 3-item bibliography.

https://www.tiktok.com/foryou. FLAAR Mesoamerica video of a few seconds.

https://www.instagram.com/reel/Cu2mI8ptq3q/. FLAAR Mesoamerica, same video as on TikTok of the orange flowers.

https://www.instagram.com/flaarmesoamerica/reel/Cwlp8MlPJeL/ Posted August 30, 2023, with photos and video by Edwin Solares, FLAAR Mesoamerica. Shows the white flowers discovered by FLAAR in summer 2023. Videos in this Instagram post show the pollinators at work.

https://www.digital-photography.org/digital-camera-vs-iPhone-14-Pro-Max-review/iPhone-14-Pro-Max-macro-mode.php. Posted July 14, 2023, shows the white flower variant with a bee ready to pollinate it. So Hellmuth published the white flowers already in summer of 2023.

Later in June we will also be posting our complete photo corpus of aerial photos of the white-flowering manzanote tree as we found it in summer 2023.

BUNKENBURG, Alexander and Laia HAURIE

2025 The discovery of dioecious *Leuenbergeria lychnidiflora* (DC.) Lodé (Cactaceae) in Guatemala. *Bradleya* 43/2025, pages 54-60.
Article kindly sent to FLAAR by Bunkenburg. In the article they document their botanical discovery (by Laia Haurie) that this species is also dioecious. Also has helpful References Cited. The park ranger of the Heloderma reserve took Bunkenburg and Haurie to the same white-flowering manzanote tree in their visit of 2024 that the FLAAR Mesoamerica team had discovered in 2023 and that Hellmuth already published.

HURTADO, Vivian and Nicholas HELLMUTH

2023 FLAAR Annual Report, For Year 2023. 69 pages.
The back cover shows a green-colored bee popping back out of the white manzanote flower. Page 35 shows this bee before it dives down into the center of the flower.

Additional Reading

We have a more complete bibliography in other FLAAR Reports but here are two essential research reports on cacti of genus *Pereskia*.

LEUENBERGER, Beat Ernst

1986 Pereskia. *Memoirs of the New York Botanical Garden 41*: 1–140.

LEUENBERGER, Beat Ernst

2008 Pereskia, Maihuenia, and Blossfeldia—taxonomic history, updates, and notes. *Haseltonia* 14: 54–93.

We do not have funding to buy articles or monographs so would greatly appreciate if a kind botanist could send us a PDF of each of these essential publications. Our email is: NHellmuth@FLAAR.org