

Photogenic wild Morning Glory Flowers of Nakum and Yaxha areas of PNYNN



Volume 8 for Series:

Flowers worth experiencing at Parque Nacional Yaxha, Nakum and Naranjo, PNYNN
Reserva de la Biosfera Maya, RBM, Peten, Guatemala

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CONTENTS

Introduction to Colorful, Wild Morning Glory Flowers and Vines, Genera <i>Ipomoea</i> and <i>Aniseia</i> .	1
Chapter 1 Similar to <i>Ipomoea pandurata</i> , Wild Sweet Potato, Now named <i>Ipomoea lindenii</i>	2
Chapter 2 <i>Aniseia martinicensis</i> (Jacq.) Choisy, morning glory family, Convolvulaceae, Savanna East of Nakum, PNYNN, RBM, Peten	10
Chapter 3 White Morning Glory Vines and Flowers around the Savanna East of Nakum, PNYNN.	16
Chapter 4 <i>Ipomoea alba</i> , used by the Olmec and Maya for thousands of years	26
Chapter 5 Purple Morning Glory between Lake Yaxha and Laguna Sacnab, PNYNN	37
Chapter 6 Pink-Lavender Morning Glory, Rio Ixtinto, Lake Yaxha, PNYNN	42
Chapter 7 Deep Purple wild Morning Glory, and Lilac wild Morning Glorym Both inland from west side of Rio Ixtinto, PNYNN.	45
Chapter 8 Yellow Leaf (not Yellow Flowers) in same area as Deep Purple wild Morning Glory and Pink wild Morning Glory. Both inland from west side of Rio Ixtinto, PNYNN	62
Chapter 9 Morning Glory Vine Flowers of Various Colors at West End of Lake Yaxha, PNYNN.	67
Chapter 10 We discuss and illustrate the bright yellow flowers of Genus <i>Merremia</i> , morning glory family Convolvulaceae, in a separate FLAAR Reports.	77
Chapter 11 What species of <i>Ipomoea</i> are listed for Peten, Belize, Chiapas, Tabasco, Campeche and Quintana Roo	79
References Cited and additional Suggested Reading	81
Appreciation and Acknowledgements	82



Photographs by Nicholas Hellmuth, Maria Alejandra Gutierrez and Elena Siekavizza

Introduction to Colorful, Wild Morning Glory Flowers and Vines, Genera *Ipomoea* and *Aniseia*

You can find brightly flowering morning glory vines all over the world. In front of the houses adjacent to the FLAAR Mesoamerica office resident there are several morning glory vines so happy that they grow over a meter long each week. But not many people have seen WILD morning glory flowers and vines in remote areas of Guatemala. But there are so many species of wild morning glory vines native to Guatemala and adjacent countries that we are now preparing two volumes: the present volume is for Genus *Ipomoea* and Genus *Aniseia*. The morning glory plants of Genus *Merremia* have so many uses for the Classic Maya people over a thousand years ago that we will have a special volume on the beautiful yellow flowers of species of genus *Merremia* of Yaxha and Nakum areas of PNYNN.

The white-flowering *Ipomoea alba* has the key chemical to mix with the latex of *Castilla elastica* to create rubber. *Ipomoea alba* also has edible parts, so for several reasons we have a separate chapter on *Ipomoea alba*. Indeed several other (but NOT all) *Ipomoea* have edible parts (more than just the healthy sweet potato, *Ipomoea batatas*).

What is wonderful about coming to Yaxha is that there are so many different wild species of morning glory that you see every shade of pink to purple, magenta to lilac—plus white. And lots of bright yellow species of Genus *Merremia* that we show in a separate FLAAR Reports.

In the final chapter I list about 25 different species of *Ipomoea* that have been found in Peten—and this does not include other morning glory species that are in different genera. So definitely a great thesis or PhD dissertation topic: Ethnobotany and Ecology of *Ipomoea* in Peten. Nowadays you don't need the tons of camera lenses, tripods, lighting, accessories, etc—a Google Pixel 10 XL or an iPhone 17 Pro Max can nowadays even accomplish telephoto photos.

If you try to compare photos with photos on-line you quickly realize that lots of species can appear in various colors—and—lots of species are misidentified on-line. So other than a few examples, I have not attempted to put a species name—that is best accomplished by a botanist who specializes in *Ipomoea*—and this botanist can be co-author of a revised, updated edition.

Chapter 1

Similar to *Ipomoea pandurata*, Wild Sweet Potato Now named *Ipomoea lindenii*

Portal de Biodiversidad de Guatemala does not lists one occurrence of *Ipomoea pandurata* in Guatemala. Nor does the checklist of plants of Belize. So either our photos show a different species, or we are the first to find *Ipomoea pandurata* in Peten, since there are no gardens near the Savanna East of Nakum from where it could have escaped.

But...every several years botanists update the nomenclature, and today the correct, accepted name is *Ipomoea lindenii* so searching for this name you find it in Guatemala for several areas of Guatemala—but, not for Peten or adjacent Alta Verapaz. The most recent botanical description is in Wood et al. 2020: 710ff.

A majority of essential botanical monographs have only line drawings—no full-color photos. Our goal is to provide full-color photos, both from the top and from the side, when possible.

If botanists suggest that the *Ipomoea* here is different than I suggest, that will be appreciated. No *Ipomoea lindenii* has been reported for Peten. And this species is also not in the list for Belize by Balick, Nee and Atha (2000).





Ipomoea
possibly
pandurate.

Savanna
East of
Nakum,
Mar. 28,
2019, NH
with 60mm
Nikkon lens
on Nikon
D810.



We found and photographed these morning glory flowers after a 25-minute hike. These morning glory vines were around a seasonally dried aguada. Feb. 19, 2019.

Although *Ipomoea pandurata* is not listed for Peten or Belize, that is my initial guestimate. Best if a botanist with decades of experience with *Ipomoea* and their relatives can provide an identification.

But in the meantime, we wish to have these photos available to scholars, students and the interested general public. So far, we have no reports of any botanist having accomplished botanical research hiking out from the Nakum base camp.

Plus our goal is to make these photos available to IDAEH and CONAP who are the co-administrators of Parque Nacional Yaxha, Nakum and Naranjo.





We found and photographed these morning glory flowers after a 25-minute hike. These morning glory vines were around a seasonally dried aguada not far from Nakum. Feb. 19, 2019.

I like to photograph flowers from several different angles, keeping in mind that since these vines are high above ground level, it was not realistic to photograph down inside from the top. But that view is visible on our first page for this species.

Leaf-cutting ants have cut off segments of the flower, plus chewed off segments of leaves in the background.

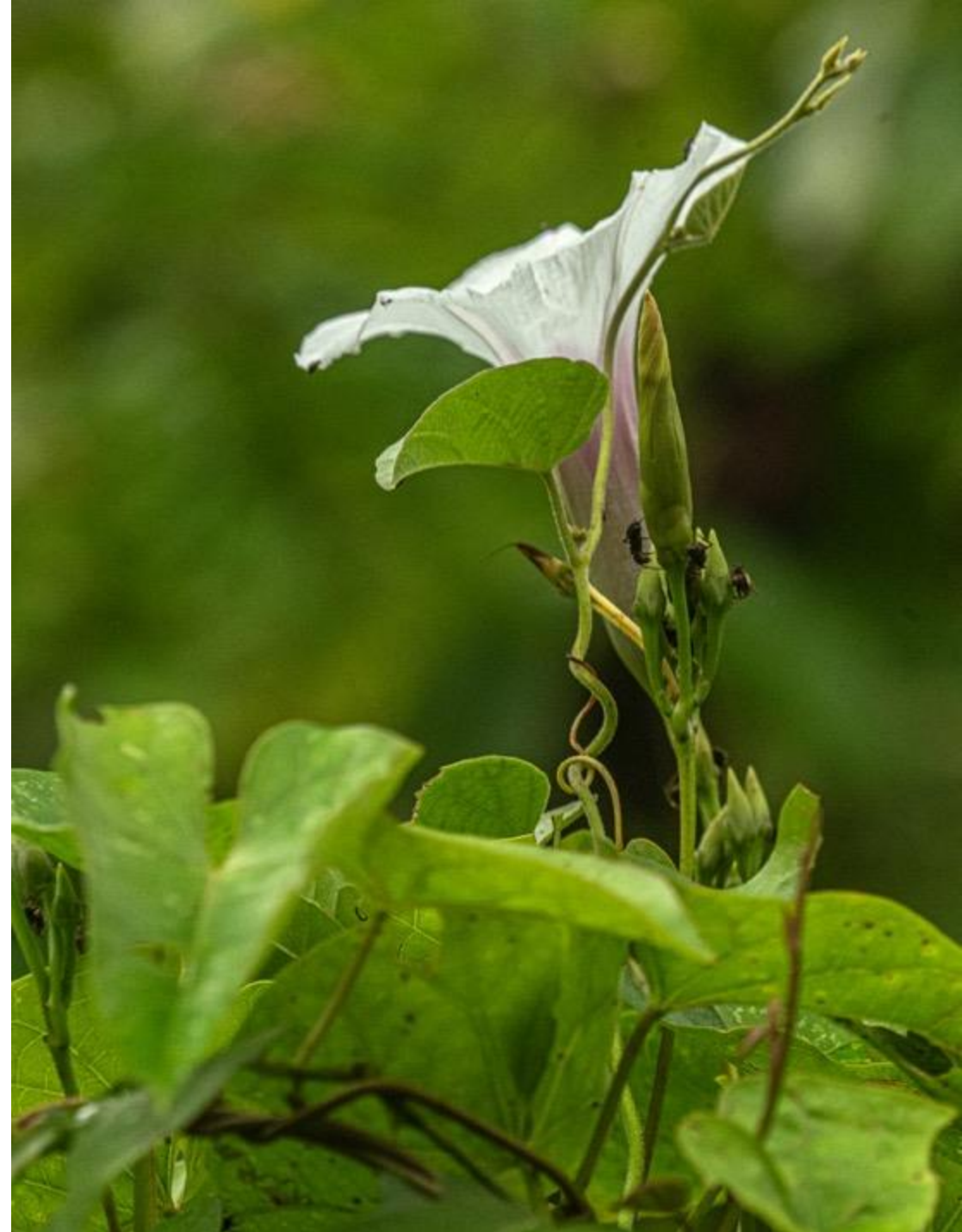
But this view from above allows you to see down into the dark purple or lavender interior.

This seasonally inundated aguada is filled with plants in the dry season that then survive being flooded in the rainy season. This aguada is near the camp ground at Nakum.



The vine and leaves cover the purple area that is inside the lower 70% of the flower.

Aguada near the camp ground at Nakum, PNYNN, RBM, Peten.



Several of the nearby leaves have been chewed off by leaf-cutting ants.

Aguada near the camp ground at Nakum, PNYNN, RBM, Peten. Feb. 18, 2019.



Several of the nearby leaves have been chewed off by leaf-cutting ants.

Aguada near the camp ground at Nakum, PNYNN, RBM, Peten. Fen. 18, 2019.

Since the aguada has standing water in the rainy season its soil holds moisture during parts of the dry season, so lots of plants like to grow here.



Chapter 2

***Aniseia martinicensis* (Jacq.) Choisy, morning glory family, Convolvulaceae, Savanna East of Nakum, PNYNN, RBM, Peten**

Hellmuth found a large savanna on satellite views on-line and aerial photos of IGN. We hiked several kilometers from the base camp of IDAEH-CONAP park rangers who protect Nakum. The hike is up and down lots of hills. There is a remarkable geological fault with a narrow chasm “that leads down to Xibalba.”

Once we figured out a way to cross the geological fault at the upper side of the hill, we could see a huge open grassland with the Neotropical sun shining off the grasses, sedges and other ground covers. To have hiked through the seasonal rain forest and then to see an open savanna was emotional—so emotional that I literally cried with joy all the way down the steep hill to the “ring of moist area” that encircles most of the savannas of PNYNN. Then we hiked out into the savanna to document the tasiste palms, the *Crescentia cujete* calabash trees (jicaro, morro), and some Nance trees. The palm and calabash trees are the “logo trees” for what defines a seasonally inundated savanna in PNYNN and PNLT. There are no large savannas in PANAT and we have not had funding to study remote biodiverse ecosystems in Parque Nacional Sierra del Lacandon, PNSL, to the west (bordering on the Peten-Chiapas border).

While hiking into this Savanna East of Nakum we noticed several vines, including *Passiflora* and other vines of the Morning Glory family, Convolvulaceae. The present chapter is on these white flowers. I prefer the name Bejuco de Pescado and not *Ipomea Blanca*. The name Bejuco de Pescado in El Salvador, “the tough stems being used there for stringing fish.” (Standley and Williams 1970: 7).

We show dozens of other plants from this savanna in Hellmuth 2021.



If we are correct in suggesting that these white flowers are of *Aniseia martinicensis*, then we are among the first botanical research team to document these in-depth, because in Portal de Biodiversidad de Guatemala, there is one lonely mention for this plant and nowhere near Peten.

Goodwin et al. 2013 list *A. martinicensis* as in Vegetation Type: savanna (page 38).

Curiously, the excellent botanical and ethnobotanical monograph by Balick, Nee and Atha list no edible uses, no medicinal uses of *Aniseia martinicensis*. But in my research notes: Are any parts of *Aniseia martinicensis* edible?

Aniseia martinicensis is listed as edible in Malaysia listed in the book on Edible Leaves of the Tropics by Martin and Roberts (1975: 189).

Aniseia martinicensis is listed in Food Plants International (a list on the Internet, <https://foodplantsinternational.com/>).

Google AI lists (but provides no citations whatsoever):

Culinary uses

Leaves: The leaves of the plant are gathered and eaten as a supplementary vegetable.

Whole plant: In certain regions, the entire plant, including the stems, has been cooked and consumed.

Soup ingredient: The leaves can be eaten raw or cooked in soups.

Medicinal uses

Seeds: The seeds of *A. martinicensis* are used in traditional medicine systems.

General medicine: The plant is used as a medicine in its native range of tropical America.



The leaves and stems of this plant have erect fuzzy borders—I estimate these are to keep insects away.

These initial four pages of photos are by Elena Siekavizza, FLAAR Mesoamerica.



Although I like 4-petalled flowers because this 4-part geometric design is common in Maya art, I also like the 5-petalled motif. In the 1970's we found a Maya plate with 5-petalled geometric design, that has been on exhibit in the Yaxha museum. But lots of other flowers have 5-petals.





The thick vegetation in the background is the base of the hill that rises above the north side of the Savanna East of Nakum.

We show lots of photos of all the different plants that like to grow in this savanna in Hellmuth's 2021 report.



**Suggested Reading that on *Aniseia martinicensis* that is pertinent for Guatemala,
selected from <https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:30070865-2>**

AUSTIN, D. F.
1999 The genus *Aniseia* (Convolvulaceae). Systematic Botany 23: 411-420.

BALICK, M.J., NEE, M.H. and D. E. ATHA
2000 Checklist of the Vascular Plants of Belize with Common Names and Uses: i-x, 1-246. New York Botanic Garden Press.

STANDLEY, Paul C.
1938 Convolvulaceae. Publications of Field Museum of Natural History, Botanical Series 18(3): 960-974.

Additional Reading on *Aniseia martinicensis* suggested by Hellmuth:

GOODWIN, Zoë A.; LOPEZ, German N.; STUART, Neil; BRIDGEWATER, Samuel G. M.; HASTON, Elspeth M.; CAMERON, Iain D.; MICHELAKIS, Dimitris; RATTER, James A.; FURLEY, Peter A.; KAY, Elma; WHITEFOORD, Caroline; SOLOMON, James; LLOYD, Adam J. and David J. HARRIS
2013. A checklist of the vascular plants of the lowland savannas of Belize, Central America. *Phytotaxa* 101. 119 pages.

HELLMUTH, Nicholas
2021 Savanna East of Nakum, Savanna of Multiple & Biodiverse Micro-Ecosystems, Parque Nacional Yaxha, Nakum y Naranjo (PNYNN). FLAAR (USA) and FLAAR Mesoamerica (Guatemala). 95 pages in the downloadable PDF.
<https://flaar-mesoamerica.org/wp-content/uploads/2022/10/savanna-east-of-Nakum-text-for-PDF-edit-VD-sept-2021-AG.pdf>

McDONALD, Andrew
1993. Flora de Veracruz. Convolvulaceae I. Fascículo 73. Instituto de Ecología, A.C. Xalapa, Ver. University of California, Riverside, CA. 50 pages. Available online: www1.inecol.edu.mx/publicaciones/resumeness/FLOVER/73-McDonald_I.pdf

MARTIN, Franklin W. and Ruth M. ROBERTS
1975. Edible Leaves of the Tropics. AID, Department of State, and the Agricultural Research Service, U.S. Department of Agriculture. 235 pages.

STANDLEY, Paul C. and Louis O. WILLIAMS
1970 Flora of Guatemala. *Fieldiana: Botany*, Vol. 24, Part IX, Numbers 1 and 2. Field Museum of Natural History.

VILLASEÑOR, José Luis
2016 Checklist of the native vascular plants of Mexico. *Revista mexicana de biodiversidad*, Vol. 87, pages 559-902.

White Morning Glory Vines and Flowers around the Savanna East of Nakum, PNYNN

The entire Savanna East of Nakum is ringed by trees. At the north side there is a steep hill.

All the photos on the present and following pages are by Maria Alejandra Gutierrez with a Canon EF24-105mm f/4L IS USM lens on a Canon EOS-1D X Mark II camera, March 28, 2019, at 10:52am.

Most of the plants that grow wild in this pristine savanna are edible, the most obvious ones being *Crescentia cujete*, tasiste palm, Nance and more. I was very and pleasantly surprised to learn from library research that the leaves of *Aniseia martinicensis* are used as food in several countries around the world, so would have been edible for the Classic Maya (even if no longer eaten in Peten or Belize today). If you Google the plant name and the word uses, you get lots of results of which

<https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:30070865-2/general-information> is helpful since Kew Gardens is a respected botanical research garden.







These flowers survive even though they are not at the top of the vegetation. Evidently enough sunlight passes through the grasses and sedges to satisfy this species of morning glory.



Here you can see the fuzz rising off both sides of the leaf and also on the stem leading up to the flower.

All the photos on the present and previous pages are by Maria Alejandra Gutierrez with a Canon EF24-105mm f/4L IS USM lens on a Canon EOS-1D X Mark II camera, March 28, 2019, at 10:52am.

Merremia aegyptia is another white morning glory flower that is native to Peten (see our separate FLAAR Reports on *Merremia* species). So need to take photos of the leaves of the white morning glory in the savannas of PNYNN to double-check what genus and what species.

Merremia cissoides is another morning glory, with a white flower, native to Peten.





Savanna
East of
Nakum,
PNYNN.

March 28,
2019.

If you Google
Savanna
East of
Nakum,
Hellmuth,
FLAAR you
will find lots
of our
reports to
download,
including
aerial
photos from
our drone
camera. The
phone on
the present
pages is with
a Nikon.



Savanna East of Nakum, PNYNN.

March 28, 2019.



Savanna East
of Nakum,
PNYNN.

March 28,
2019.

The gray
clouds
suggest that it
will rain this
evening, even
though March
is in the “dry
season”.



Savanna East of
Nakum, PNYNN.

March 28, 2019.



In which States of Mexico is *Aniseia martinicensis* listed by Villaseñor

Aniseia martinicensis (Jacq.) Choisy CAM, CHIS, GRO, OAX, QROO, TAB, VER, YUC (Villaseñor 2016: 701)

So *Aniseia martinicensis* occurs all around Peten: Chiapas, Tabasco, Campeche, Quintana Roo (and up in Yucatan).

Shore of Lake Yaxha, Dec. 22, 2018.



Chapter 4

***Ipomoea alba*, used by the Olmec and Maya for thousands of years**

Cropped to enlarge the flower so you can see the details more easily.

I have studied *Ipomoea alba* in-depth since it is the main plant used by the Olmec, the Maya, and other Mesoamerican people to vulcanize the latex of *Castilla elastica* to make rubber (over a thousand years before Goodyear used other process) (Hellmuth 2023). We raised *Ipomoea alba* in the FLAAR Ethnobotanical Research Garden (until the trees grew so high they shaded out all the vines). But now I have noticed that *Ipomoea alba* itself is edible:

Edible Uses

Young leaves and fleshy calyces - cooked. Steamed and eaten as a vegetable or used in curries, soups, stews etc. They can also be dried for later use. Seed - eaten when young (citing Facciola 1990).



Along the road between Lake Yaxha and
Laguna Sacnab, PNYNN, Nov. 26, 2018.

We estimate that this may be *Ipomoea alba*.

The bright yellow color are leaves.



Ipomoea alba is found in Belize,
Reg Use: FIBR, MED, OIL, BEV
(Balick, Nee and Atha
2000). Should add a special
note, that *Ipomoea alba* is used
to vulcanize *Castilla elastica* to
make Maya rubber.

Portal de Biodiversidad de
Guatemala lists *Ipomoea alba* in
several places in Peten, not far
from Flores. So if found on the
NW shore of Lake Peten Itza, it
would be likely to find it along
the shores of Lake Yaxha and
Laguna Sacnab.

But would help to find a fully
opened flower so we can
document whether the wilted
flowers are really *Ipomoea alba*.





In several FLAAR Reports by Hellmuth we show *Ipomoea alba* flowers from the FLAAR Ethnobotanical Research Garden. But all the photos here are from Parque Nacional Yaxha, PNYNN, Reserva de la Biosfera Maya, RBM, Peten.



South shore
of Lake
Yaxha not
far from
hotel El
Sombrero
Ecolodge.
Dec. 22,
2018.

Most years,
instead of
taking a
vacation on
Christmas
week, I
accomplish
a field trip
to find and
document
plants that
deserve
study and
publication.





Every plant has to do what it can to find a place to grow, and especially, to get as much sunshine as possible.



As you can see,
these morning
glory vines
grow up from
the shore.

Note that only
one or two
flowers are
open at the
same time.





The vines of morning glory species have to compete with other energetic vines.



Chapter 5

Purple Morning Glory between Lake Yaxha and Laguna Sacnab, PNYNN

Lots of droplets of water. The common purple morning glory is listed for Guatemala on the Internet but is nowhere in Portal de Diversidad de Guatemala for Peten, nor in the Belize list by Balick, Nee and Atha (2000).

Portal de Diversidad de Guatemala lists *Ipomoea purpurea* primarily for the Maya Highlands—not for Peten.

Would help if a botanist who specializes in *Ipomoea* could suggest what species this is. A bit more of the leaves are shown on the following page.







Pink, lavender morning glory at PNYNN. So this is probably a different species.

On the shore below the IDAEH camp. Nov. 27, 2018.





Chapter 6

Pink-Lavender Morning Glory, Rio Ixtinto, Lake Yaxha, PNYNN

Rio Ixtinto flows on the west side of Topoxte Island to enter Lake Yaxha, PNYNN. The banks of this stream are filled with different flowers each month.

The river is transitable about 1 kilometer and arrives at a tinal area—pure palo de tinto trees (*Haematoxylum campechianum*). In the dry months the river level is low so fallen trees will damage the motor blades—but even in the dry season you can go about one or two football field lengths upstream to see all the flowers on both sides of the river.

Since the Rio Ixtinto flows past Isla Topoxte, you can stop here to hike into the Post Classic temples and small pyramids, and then go back to the lancha to take you up the Rio Ixtinto. Just be sure to tell the lanchero (boat capitan) in advance that you want to go up the stream in addition to seeing the ruins of Topoxte.



Four of these pink lavender morning glory flowers are inland from the edge of the Rio Ixtinto.

Since 2024 all this area has been underwater, since Lake Yaxha has risen several meters high due to heavy rains in the rainy season. This photo is from June 5, 2019, in a decade with less rain.

All these photos are by Maria Alejandra Gutierrez.





Centimeter ruler to show the size of the flower.

At the right is a bud that will scroll open tomorrow.



Chapter 7

**Deep Purple wild Morning Glory,
and Lilac wild Morning Glory
Both inland from west side of
Rio Ixtinto, PNYNN**

Most of these morning glory flowers are deep pink (lilac), but some could be considered as shades of purple (on the following page). Magenta could be another color designation.





Deep purple wild morning glory flower with its large leaves, inland from west side of Rio Ixtinto, PNYNN.

Deep pink wild morning glory in the same area.

I estimate that these are two different species.

Jan. 22, 2019.





These pink morning glory flowers co-exist with lots of other plants in the same area.





To identify the species it helps to have front-views of the flowers. But it's also essential to show the leaves.



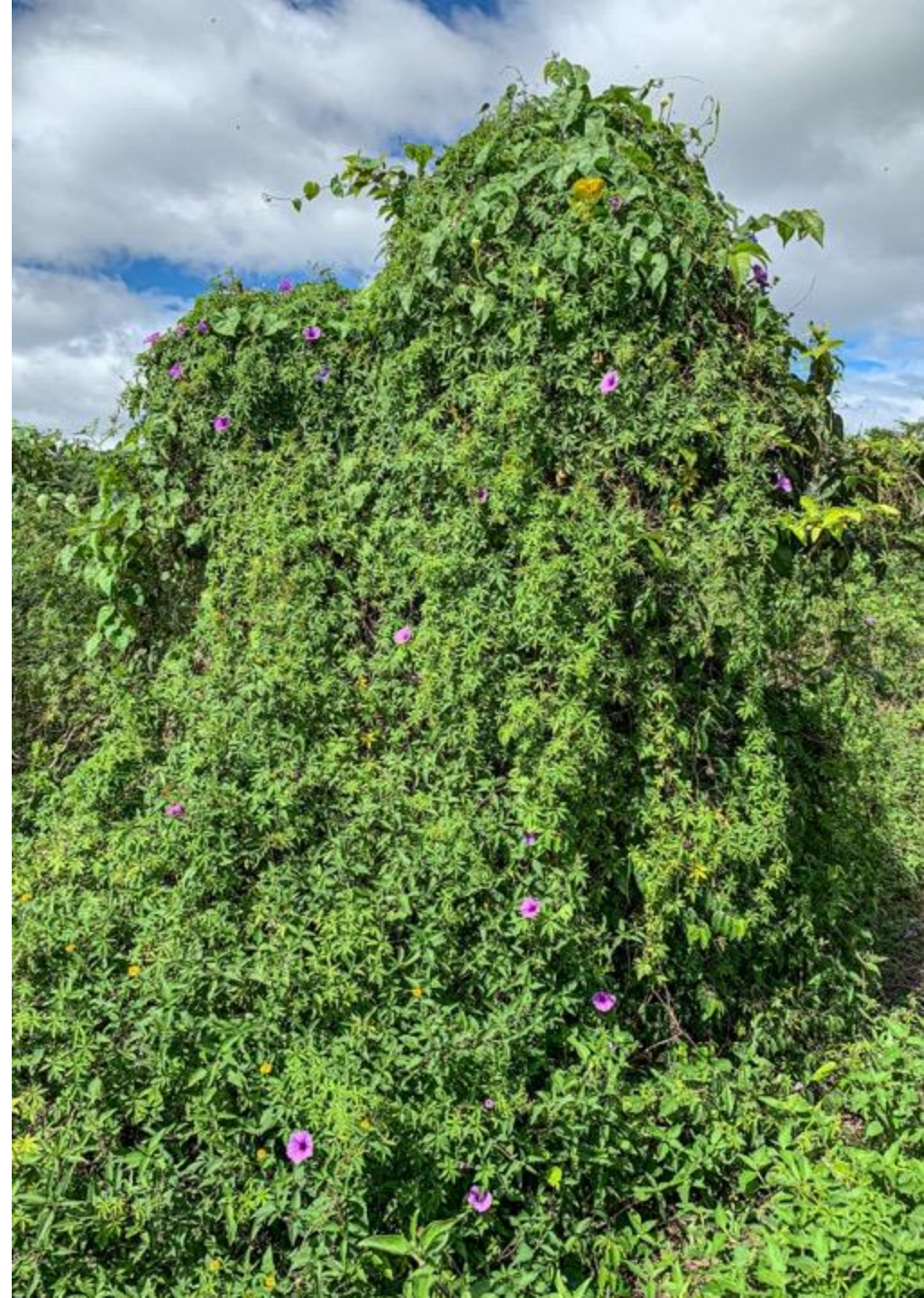
If you have 20:20 vision or good reading glasses, you can see the pink-lavender morning glory flowers. When there are trees or shrubs available the vines wander upwards—but they are not parasites.



Then a low tree or high shrub is available, the morning glory vines work hard to climb up. Although these morning glory vines are not parasites, they do smother the tree which means that tree no longer receives any sunlight.



At the left is the
purple species.





In this area
you can see
more of the
purple
species.





When you illuminate the upper flower with more light, you can notice that its interior is dark lavender.

And the inside of the lower flower is much lighter (pinkish white).

Thus I estimate that these are two different species of morning glory plants.



I estimate that these pink flowers are a different species of *Ipomoea* than the purple ones.



All the photos in this chapter are inland from the banks of Rio Ixtinto.









Since this area is seasonally inundated, and sometimes under water for several years, there are no bushes or trees.

So these morning glory vines have to wander around the ground—but at least here they get full-sun all day long.





Chapter 8

**Yellow Leaf (not Yellow Flowers) in same area as
Deep Purple wild Morning Glory and Pink wild Morning Glory
Both inland from west side of Rio Ixtinto, PNYNN**



Looks like lots of yellow flowers at the left.

These “yellow flowering” plants are in the same seasonally inundated flatland area as the purple morning glories at the right.





Now you can see that these are large yellow leaves, not yellow flowers.



Each kind of plant does what it can to survive.







Chapter 9

Morning Glory Vine Flowers of Various Colors at West End of Lake Yaxha, PNYNN

The colors vary depending on how much sun hits them. And each camera has slightly different color preferences—though our goal is to have a true actual color.





We show this photo twice so you can see more details and compare-and-contrast with other flowers in the same area.



The insides of this species is white, albeit tinged with the main color.

Gorgeous color of the flowers.

The vine heads up to find a support but since there is nothing up there, it has to turn around and search elsewhere.



The vine is constantly searching for where it can support itself and grow further up or outwards.

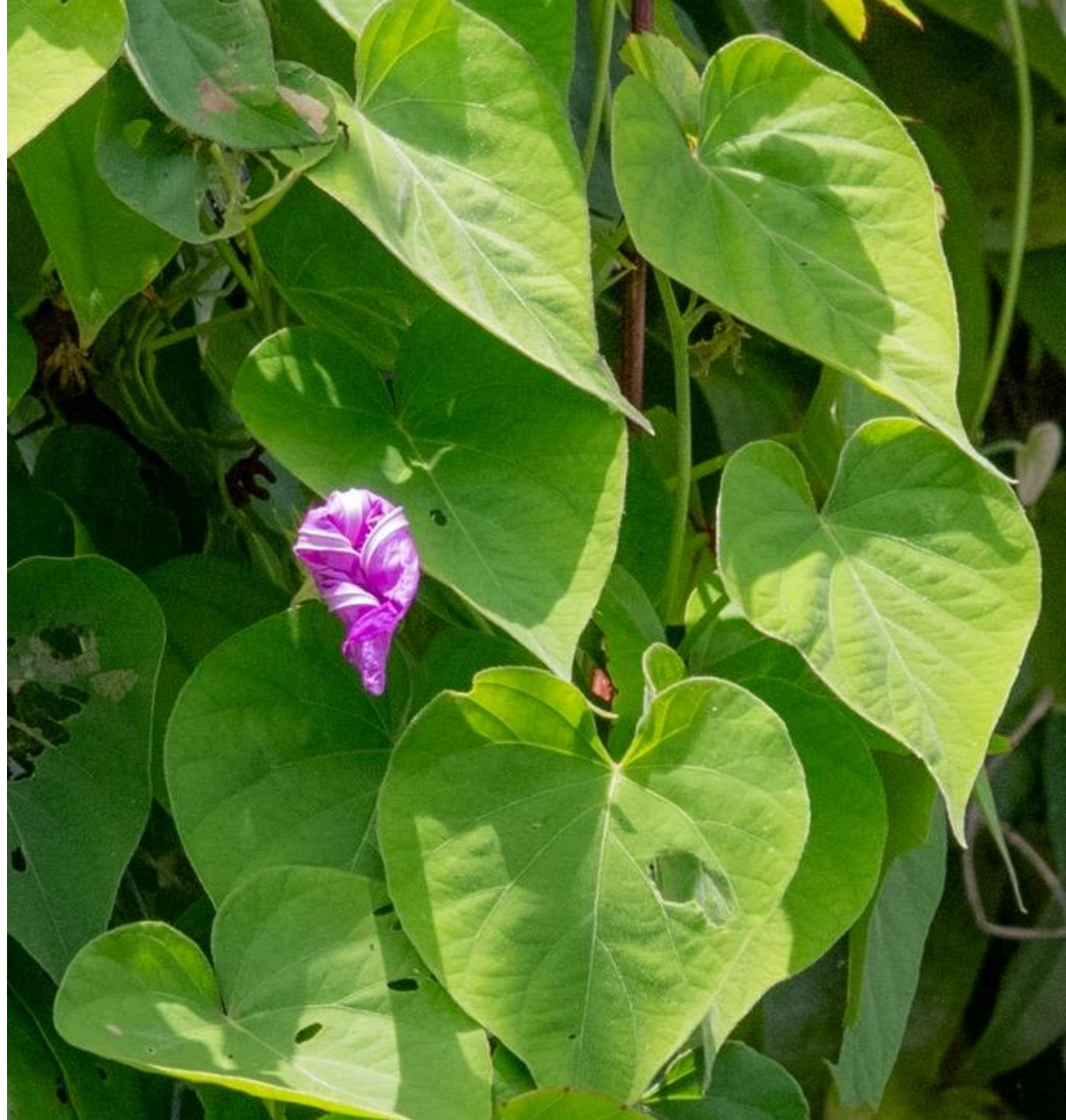






Lots of leaves to soak up the sun. Very few flowers for this wild morning glory.

Would be great if a student could accomplish videos that show each species opening in the morning and then closing.



Interesting to see, and learn, that the young leaves are a different color than the older leaves. Such color changes of leaves are common (such as the autumn changes into bright colors before the leaves fall off across the USA and Canada). But they are not as often documented for plants of the Maya areas.



Wandering morning glory vines grab onto everything that they can find.



Chapter 10

We discuss and illustrate the bright yellow flowers of Genus *Merremia*, morning glory family Convolvulaceae, in a separate FLAAR Reports

We first noticed bright yellow flowers of Genus *Merremia* while driving to Telemán, Alta Verapaz. Several of the helpful FLAAR Mesoamerica team are Q'eqchi' speaking Maya come from Senahu, north of Telemán. So, over many years we accomplished ethnobotanical research between the Río Polochic and Senahu and from there to Cahabón.



Genus *Merremia* is also part of the morning glory family, Convolvulaceae.

Merremia estimated to be *umbellata* flower, Savanna East of Nakum, March 28, 2019.

Photo by Nicholas Hellmuth with Nikon D810 with Nikkor 60mm lens.



Chapter 11

What species of *Ipomoea* are listed for Peten, Belize, Chiapas, Tabasco, Campeche and Quintana Roo

Portal de Biodiversidad de Guatemala

Ipomoea aculeatum: **Peten**, La Libertad, La Joyanca.

Ipomoea acuminata: **Peten**, near Flores; Tikal

Ipomoea alba: **Peten**, near Flores, Saepuy; NW shore Lake Peten Itza.

Ipomoea anisomeres: **Peten**, Tikal airfield

Ipomoea aquatica: **Peten**, sitio arqueológico El Tintal

Ipomoea batatas: **Peten**, Tikal near airfield; NW shore Lake Peten Itza; road to La Libertad, 5km from Santa Elena.

Ipomoea clavata: **Peten**, NW shore Lake Peten Itza, Uaxactun, Arroyo Paxcaman.

Ipomoea contrerasii: **Peten**, Uaxactun, Arroyo Paxcaman.

Ipomoea cordatotrilobax: **Peten**, road to Melchor.

Ipomoea crincalyx: **Peten**, Cuxu, 13 km from Santa Elena; Cadenas-Puerto Mendez, km 167; NW shore Lake Peten Itza

Ipomoea hederifolia: **Peten**, Sabana San Miguel, north of Lake Peten Itza; road to Santa Elena; Tikal; Rio Sarstun, corozal.

Ipomoea heterodoxa: **Peten**, Tikal, Temple in H Group; NW shore Lake Peten Itza; Dos Lagunas, 9km east.

Ipomoea indica: **Peten**, Biotopo El Zotz, cibal El Palmar; Tikal; NW shore Lake Peten Itza.

Ipomoea nil: **Peten**, Cuxu, 13 km from Santa Elena; Tikal

Ipomoea peteri: **Peten**, Tikal, around an aguada; NW shore Lake Peten Itza; Dos Lagunas, Ixcanrio trail; La Libertad; Dolores.

Ipomoea philomega: **Peten**, Los Arcos, Km. 144 on Cadenas road

Ipomoea ramosissima: **Peten**, La Cumbre, km. 145

Ipomoea sagittata: **Peten**

Ipomoea sepacuitensis: **Peten**, Tikal.

Ipomoea splendor-sylvae: **Peten**, near Flores, Saepuy

Ipomoea steerei: **Peten**, Tikal, Bajo de Santa Fe,

Ipomoea trifida: **Peten**, sabana; Tikal.

Ipomoea trilobax: **Peten**, Tikal, airfield

Ipomoea tuxtlensis: **Peten**, Tikal; Dolores, km 82; Bajo El Venado.

Ipomoea variabilis: **Peten**, west bank of Lake Peten Itza

Ipomoea wrightii: **Peten**, Tikal, Aguada Terminos.

Ipomoea aculeatum:

Ipomoea acuminata:

Ipomoea alba: Reg Use: FIBR, MED, OIL, BEV. Should add a special note, that *Ipomoea alba* is used to vulcanize Castilla elastica to make Maya rubber.

Ipomoea anisomeres:

Ipomoea aquatica: Belize

Ipomoea batatas: Reg Use: FOOD.

Ipomoea carnea Jacq. subsp. *fistulosa* (not in Guatemala list): Loc Use: MED, ORN. — Reg Use: MED.

Ipomoea clavata: Loc Use: MED.

Ipomoea contrerasii:

Ipomoea cordatotrilobax:

Ipomoea crincalyx: Belize

Ipomoea hederifolia: Reg Use: MED.

Ipomoea heterodoxa: Reg Use: MED.

Ipomoea imperati: (not in Guatemala list)

Ipomoea indica: Reg Use: MED.

Ipomoea mauritiana: (not in Guatemala list)

Ipomoea meyeri: (not in Guatemala list)

Ipomoea minutiflora: (not in Guatemala list)

Ipomoea nil: Reg Use: MED.

Ipomoea pes-caprae: Loc Use: DYE, MED. — Reg Use: FORG, MED, PRD.

Ipomoea peteri: (not in Guatemala list)

Ipomoea philomega: Belize

Ipomoea quamoclit: Reg Use: MED.

Ipomoea ramosissima: Belize

Ipomoea sagittata: Belize

Ipomoea sepacuitensis: Belize

Ipomoea setifera: (not in Guatemala list)

Ipomoea setosa: (not in Guatemala list)

Ipomoea splendor-sylvae:

Ipomoea squamosa: (not in Guatemala list)

Ipomoea steerei:

So about 9 species listed for Peten are not in the Balick, Nee and Atha list for Belize. And about a dozen species are in Belize but not listed for Peten.

Their helpful list shows how many *Ipomoea* species are used for Medicine, plus one for Dye. I do not list forage, since that is for animals not people. I am curious whether *Ipomoea batatas*, sweet potato, are escaped from kitchen gardens or whether they are really wild.

Ipomoea tiliacea: Reg Use: MED.

Ipomoea trifida: Belize

Ipomoea triloba: Belize

Ipomoea tuxtlensis: Belize

Ipomoea umbraticola: Belize

Ipomoea variabilis:

Ipomoea violacea: Belize

Ipomoea wrightii:

Balick, Nee and Atha 2000

References Cited and additional Suggested Reading

Since there are scores of *Ipomoea* species and other relatives, there are thousands of articles, chapters, theses, and lots of monographs on plants of the Convolvulaceae family. You can find tons of research material on-line and in the bibliography of the 823-page botanical monograph on *Ipomoea* by Wood et al. 2020. On the present page I show what I use since I have to study dozens, scores, hundreds of different plants.

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HELLMUTH, Nicholas

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Biolg. Ana Lorena Lobos Morales (CONAP)

INITIATION AND COORDINATION OF THE PROJECT OF COOPERATION FOR 2021-2026

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Marla Mercedes Bolvito Jerónimo, Unidad de Cooperación Nacional e Internacional de la Secretaría Ejecutiva de CONAP

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Lic. Apolinario Córdova, CONAP Petén (in initial years)

FOR COOPERATION, HOSPITALITY, AND ASSISTANCE AT PNYNN WE THANK

all the helpful and knowledgeable guides of IDAEH CONAP at PNYNN who accompanied us each day. It is essential to have either an IDAEH and/or CONAP guardabosque or comparable when doing flora and fauna research in a national park. Plus we appreciate the assistance of the military at the Yaxha park entrance to help us on field trips to find and document the far-away Savanna of 3 Fern Species at the west end of PNYNN.

ASSISTANCE FOR KNOWLEDGE OF PLANTS AND ANIMALS OF PNYNN

Teco, Moises Daniel Perez Diaz, park ranger, PNYNN

We sincerely thank Juan Manuel Segovia of Lonas Segovia for donating several giant tarps that are essential for our field trips to remote areas.

TENTS AND COOKING EQUIPMENT AT NAKUM CAMP, PNYNN

Manola Margot Lima Diaz owner of Restaurante El Portal de Yaxha, La Maquina

FLAAR was formed in 1969 to map Yaxha (and nearby Topoxte Island and Nakum) and we worked with the then president of Guatemala and the head of FYDEP to initiate protection of this area as a national park. Other conservationists added the Naranjo segment. Recently we were asked to return for flora, fauna, and biosphere field work from August 2018 to July 2019. This project was successful and as a result we were asked by CONAP to return for five more years, 2021-2026, of coordination and cooperation with them, both in the Yaxha, Nakum and Naranjo national park plus all the rest of the Reserva de la Biosfera Maya (RBM), Peten, Guatemala.

Base Camp Assistance at Naranjo-Sa'al

We thank Arqueologa Vilma Fialko and Arquitecto. Raul Noriega for hospitality and place to stay and kitchen while doing field work in flora, fauna and wetlands ecosystems in the Naranjo-Sa'al area of PNYNN. We thank Horacio Palacios who assisted as a guide for how to reach the amazing Savanna West of Naranjo-Sa'al.

Base Camp Assistance at Yaxha

We thank Biologist Lorena Lobos and both co-administrators of PNYNN (Arq. Jose Leonel Ziesse (IDAEH) and Lic. Jorge Mario Vazquez (CONAP) for providing a place to stay for the photographers, biologists, and assistants of the FLAAR Mesoamerica team of flora and fauna during the 1-week-a-month field trips August 2018 through July 2019.

In turn FLAAR purchased and donated a cooking stove when the original one no longer functioned, plus we have photographed and documented many tree and insect species that we found around this camp.

Ecolodge El Sombrero

I thank Gabriella Moretti, owner of Ecolodge El Sombrero, for providing hotel room and meals while we have been doing field work at Parque Nacional Yaxha Nakum Naranjo. We also appreciate the hospitality of her sons Sebastian de la Hoz and Juan Carlo de la Hoz. Every workday is exhausting because we are carrying and then using very heavy cameras, super-telephoto lenses, sturdy tripods, large gimbals or ball tripod heads. Thus it is crucial for my health to be able to rest and totally recuperate every night in order to be ready for the following day of botanical and zoological adventures in Parque Nacional Yaxha, Nakum and Naranjo.

Equally crucial is having a place to charge the batteries of the computers, or all the cameras, and of the cell phones. Solar power is great, but it lasts only an hour, or less, if you plug in multiple computers and cameras and flash batteries to charge. So a place with enough electricity to charge the entire mass of essential field work equipment is essential and thus very much appreciated.

In order to post photographs on botanical and zoological websites, you can't do this if there is either no Internet or weak Internet. Thus it is very helpful that when we are provided rooms and meals, that Internet is also provided by the Ecolodge El Sombrero.

Contact Info: +502 5460 2934, VentasElSombrero@gmail.com or WhatsApp.

Donations make our Field Trips and Research and Publications Possible

We appreciate a donation during November 2021 to help cover the costs of FLAAR research projects specifically to assist and support the current FLAAR project of flora and fauna in the Reserva de la Biosfera Maya (RBM). This donation also assisted the FLAAR (USA) and FLAAR Mesoamerica (Guatemala) research project in the Municipio de Livingston area of the departamento of Izabal, Guatemala.

In a subsequent year we received an additional helpful donation from this family to help fund the field work and research and publications on flora, fauna and biodiverse ecosystems of PNYNN and surrounding RBM of Peten, Guatemala.

These donations are from a family in Chicago in honor and memory of botanist Dr John D. Dwyer, who worked in many areas of Mesoamerica, including in the Yaxha area in the 1970's while the site was being mapped by FLAAR.

These donations are also in recognition of the urgency and need for conservation of both wildlife and rare plants in the bio-diverse ecosystems of the Reserva de la Biosfera Maya (RBM) of Guatemala. Parque Nacional Yaxha, Nakum and Naranjo (PNYNN) is one part of the over 5 million acres of the RBM.

FLAAR is a non-profit research institute, tax exempt in USA.



HOW TO GET TO YAXHA?

MAP SYMBOLS



Archaeological sites



Airports



Dirt or gravel road



Road with deep ruts & mud



Highway





Go to the Mundo Maya airport in Santa Elena and then you will find a services of tourist vehicles to go to the archaeological site. If you want to go by car from Guatemala City, take the following route: Río Dulce - Poptún-Flores. At the junction further on you will find on the left the route to Tikal. Go straight on to the right towards Yaxha (towards Melchor de Mencos). In km. 521 at the village La Maquina, turn left to the site. Ecolodge El Sombrero is 50 meters before the entrance to National Park Yaxha - Nakum - Naranjo.

The following four pages Show the Front Covers of the first fifteen FLAAR Reports on Flowers of PNYNN worth Seeing and Learning About

The front covers are not yet hot links because we are still finishing these reports. But by end of October 2025, all fifteen will be on-line on www.Maya-ethnobotany.org and on other of our web sites.

We are also preparing FLAAR Reports on orchids and bromeliads of PNYNN.

FLAAR Reports on "How to Recognize which Tree Genus and Species by the Pattern, Color, or other Features of the Bark on their Trunk"

FLAAR Reports on edible insects of PNYNN. There are over 500 edible insects across Mexico, so we are looking for samples at PNYNN.

FLAAR Reports on waterbirds of PNYNN, published as part of a project of coordination and cooperation with FUNDAECO.

Bright Orange Flowers of *Cordia dodecandra*, Nakum Area of PNYNN, Peten, Guatemala



Volume 1 for Series:
Flowers worth experiencing at Parque Nacional Yaxha, Nakum and Naranjo, PNYNN
Reserva de la Biosfera Maya, RBM, Peten, Guatemala

Nicholas Hellmuth, FLAAR Reports, FLAAR (USA) and FLAAR Mesoamerica (Guatemala)
October 2025

4-Petalled Flowers of River Banks, Lake Shores, and Seasonally inundated Savannas

Ludwigia octovalvis



Volume 2 for Series:
Flowers worth experiencing at Parque Nacional Yaxha, Nakum and Naranjo, PNYNN
Reserva de la Biosfera Maya, RBM, Peten, Guatemala

Masses of Yellow Flowers, Genus *Combretum*, along road between Yaxha and Nakum, PNYNN



Volume 3 for Series:
Flowers worth experiencing at Parque Nacional Yaxha, Nakum and Naranjo, PNYNN
Reserva de la Biosfera Maya, RBM, Peten, Guatemala

Text and Photographs: Nicholas Hellmuth, FLAAR Reports, FLAAR (USA) and FLAAR Mesoamerica (Guatemala)
October 2025

Flowers and bizarre Bracts of *Calathea lutea*,
relative of *Heliconia* and of Banana
Naranjo-Sa'al and Savanna of 3 Fern Species
areas of Parque Nacional Yaxha, Nakum and
Naranjo (PNYNN)

Fresh Green Leaves of *Calathea lutea*
are a great Alternative to Plastic

Volume 4 for Series:
Flowers worth experiencing at Parque
Nacional Yaxha, Nakum and Naranjo,
PNYNN
Reserva de la Biosfera Maya, RBM, Peten,
Guatemala

Nicholas Hellmuth, FLAAR Reports, FLAAR (USA)
and FLAAR Mesoamerica (Guatemala),
October 2025



Costus pictus, Medicinal Flowers,
Yaxha and Naranjo-Sa'al Areas of PNYNN



Volume 5 for Series:
Flowers worth experiencing at Parque Nacional Yaxha, Nakum and Naranjo, PNYNN
Reserva de la Biosfera Maya, RBM,
Peten, Guatemala

Nicholas Hellmuth, FLAAR Reports,
FLAAR (USA) and FLAAR Mesoamerica
(Guatemala), October 2025

Piscidia piscipula, Jabin, Dogwood, with Hummingbird Pollinator
Yaxha and Nakum areas of Parque Nacional Yaxha, Nakum and Naranjo



Volume 6 for Series:
Flowers worth experiencing at Parque Nacional Yaxha, Nakum and Naranjo, PNYNN
Reserva de la Biosfera Maya, RBM, Peten, Guatemala
Nicholas Hellmuth, FLAAR Reports, FLAAR (USA) and FLAAR Mesoamerica (Guatemala), October 2025

A beautiful Red Flower, a Hibiscus Relative, but the Petals and Sepals never open
Malvaviscus arboreus, Sleeping Hibiscus



Volume 7 for Series:
Flowers worth experiencing at Parque Nacional Yaxha, Nakum and Naranjo, PNYNN
Reserva de la Biosfera Maya, RBM, Peten, Guatemala

Nicholas Hellmuth, FLAAR Reports, FLAAR (USA) and FLAAR Mesoamerica (Guatemala), October 2025

Photogenic wild Morning Glory Flowers of Nakum and Yaxha areas of PNYNN



Volume 8 for Series:
Flowers worth experiencing at Parque Nacional Yaxha, Nakum and Naranjo, PNYNN
Reserva de la Biosfera Maya, RBM, Peten, Guatemala

Nicholas Hellmuth, FLAAR Reports, FLAAR (USA) and FLAAR Mesoamerica (Guatemala), October 2025

Photogenic Bright Yellow Morning Glory Flowers of Genus *Merremia*

Nakum and Yaxha areas of PNYNN



Volume 9 for Series:

Flowers worth experiencing at Parque Nacional Yaxha, Nakum and Naranjo, PNYNN
Reserva de la Biosfera Maya, RBM, Peten, Guatemala

Nicholas Hellmuth, FLAAR Reports, FLAAR (USA) and FLAAR Mesoamerica (Guatemala), October 2025

Yellow Flower Paradise, Yellow Flowers Covering the Tree Canopy

Nakum, East of Savanna Bajo, PNYNN



Volume 10 for Series:

Flowers worth experiencing at Parque Nacional Yaxha, Nakum and Naranjo, PNYNN
Reserva de la Biosfera Maya, RBM, Peten, Guatemala

Nicholas Hellmuth, FLAAR Reports, FLAAR (USA) and FLAAR Mesoamerica (Guatemala), October 2025

Yellow Flowers & Fruits of Wild Undomesticated Squash Vines,
Cucurbita lundelliana

Along the Shores of Lakes and Rivers in Parque Nacional Yaxha, Nakum and Naranjo



Volume 11 for Series:

Flowers worth experiencing at
Parque Nacional Yaxha,
Nakum and Naranjo, PNYNN
Reserva de la Biosfera Maya,
RBM, Peten, Guatemala



Nicholas Hellmuth, FLAAR Reports, FLAAR (USA) and FLAAR Mesoamerica (Guatemala)
October 2025

Orange Masses of Flowers of Parasitic Vine (but does not kill the host)
Genus *Psittacanthus*, Yaxha, Blom Sacbe and adjacent Grupo Maler



Volume 12 for Series:

Flowers worth experiencing at Parque Nacional Yaxha, Nakum and Naranjo, PNYNN
Reserva de la Biosfera Maya, RBM, Peten, Guatemala

Text and Photographs: Nicholas Hellmuth
FLAAR Reports, FLAAR (USA) and FLAAR Mesoamerica (Guatemala)
October 2025

**Yellow-Orange Flowers of Trees of the *Caesalpinia* species,
Fabaceae family**

Bajo La Justa, between Yaxha and Nakum, PNYNN



Volume 13 for Series:

Flowers worth experiencing at Parque Nacional Yaxha, Nakum and Naranjo, PNYNN
Reserva de la Biosfera Maya, RBM, Peten, Guatemala

Nicholas Hellmuth, FLAAR Reports, FLAAR (USA) and FLAAR Mesoamerica (Guatemala), October 2025

**Gorgeous Yellow Masses of Flowers of
Haematoxylum campechianum
at Parque Nacional Yaxha, Nakum and Naranjo**

Volume 14 for Series:

**Flowers worth experiencing at Parque Nacional Yaxha,
Nakum and Naranjo, PNYNN**
Reserva de la Biosfera Maya, RBM, Peten, Guatemala

Nicholas Hellmuth

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

October 2025



**Flowers of
Orchids on Trees**
surrounding the Maya Ruins
of Yaxha, PNYNN

Vol 15 for Series:

**Flowers worth experiencing
at Parque Nacional
Yaxha, Nakum and Naranjo
(PNYNN)**

Reserva de la Biosfera Maya
RBM
Peten, Guatemala

Nicholas Hellmuth

October 2025



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