

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



A close-up photograph of a Calathea lutea flower. The flower is partially open, showing a bright yellow petal. The surrounding bracts are large, papery, and have a reddish-brown color with some brown, dried edges. The background is a soft, out-of-focus green.

**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)**

Volume 4 for Series:

CONTENTS

Introduction to <i>Calathea</i> Bracts, Flowers and Giant Leaves	1
Chapter 1	
Photographs of <i>Calathea lutea</i> , mashan, flowers (bracts) and leaves	2
Chapter 2	
<i>Calathea lutea</i> in the swamp vegetation of the Savanna of 3 Fern Species	12
Chapter 3	
Learning about using LEAVES to wrap food instead of using PLASTIC: <i>Calathea lutea</i>	18
Chapter 4	
<i>Calathea crotalifera</i>	22
Chapter 5	
Learning about other EDIBLE species of genus <i>Calathea</i>	23
References Cited and Additional Suggested Reading on <i>Calathea</i>	25



Introduction to *Calathea* Bracts, Flowers and Giant Leaves

Genus *Calathea* are in plant family Marantiaceae which includes *Thalia geniculata*. The Savanna East of Nakum has a literal island of thousands of *Thalia geniculata* plants, plus that plant in other areas.

The leaves and aspects of the bracts of *Calathea* remind me of *Heliconia* bracts—but all the many native species of *Heliconia* are in the Heliconiaceae family and related to bananas—both are in the plant order Zingiberales (bananas are not native to the Americas and are another family but very similar long leaves). *Calathea* are in the same plant order, Zingiberales, as *Heliconia* and bananas, but *Calathea* bracts remind me more of *Heliconia*.

Heliconia bourgaeana has edible and medicinal parts (Balic, Nee and Atha 2000), but research it first, since parts can be poisonous (ibid.).

Chufle has edible flowers, is native to Guatemala, and should be added to our list of edible flowers available to the Classic Maya. But *Calathea macrosepala* is not yet found in Peten. So our focus for the present FLAAR Reports is *Calathea lutea*, the most common species of genus *Calathea* in Peten and found by the FLAAR teams in several areas of Parque Nacional Yaxha Nakum and Naranjo, PNYNN, Reserva de la Biosfera Maya, RBM, departamento of Peten, Guatemala.

Calathea lutea, Savanna of 3 Fern Species, PNYNN





Chapter 1

Photographs of
Calathea lutea,
mashan, flowers
(bracts) and leaves

Calathea lutea rowing
happily surrounded by
corozo palms in corozera
habitat surrounding
Naranjo-Sa'al area of
PNYNN.

July 9, 2019, photos by
Nicholas Hellmuth with
iPhone Xs.



It's the green leaves that you use to wrap tamales or wrap other foods. *Heliconia* (many species native to Guatemala) and banana (not native but in thousands of home gardens around houses of Maya people) have similar LOOOONG tall leaves pointing upwards.

Just like banana tree leaves, the leaves of Calathea plants turn brown as they wither and die.

On the following page you can see more of the corozo palms that are the dominant tree in a corozera (an island of hundreds of corozera palms with other palm species but most are cohune (another word for corozo)).







The tall red-brown towers are bracts. Although we all love FLOWERS, it helps to see and experience the BRACTS (what supports the flowers).

I enjoy seeing and studying and learning about bracts. The bracts of *Heliconia* are very bright colors (to attract pollinators). And even though the towering bracts of these *Calathea* plants are not pure bright orange—they are more eye catching than the tiny flowers that we show on the following page.

The bright red bracts of poinsettias are of course usually misunderstood as the petals (poinsettias are native to the Highlands of Guatemala and elsewhere in Mexico).







More views of these bracts—I estimate that 90% of the people have never seen this plant part up-close and in-person.

At the left a tiny flower is rising out of the open hollow space of the bract.



A closer view of the bract, from above, helps you see where the yellow flowers sprout out of.

The photos on the previous page were taken with an iPhone Xs—the photos on the present page and following were taken with a Nikon camera.





Tiny little yellow flower segments peek out of the bract.

Parque Nacional Yaxha, Nakum and Naranjo has impressive Maya architecture, but also plants that you can photograph with your telephone, post on-line and take home to show to your family and friends



The FLAAR
Photo Archive
of Flora, Fauna
and Biodiverse
Ecosystems of
Guatemala is
one of the
larger
databases on
plants of
Guatemala in
the world.

Calathea lutea,
Naranjo-Sa'al
area of
PNYNN.
Photos by
Nicholas
Hellmuth.





Amazing how over millennia this plant evolved such a shape of bracts.

A great PhD dissertation would be comparing bracts of *Calathea* with bracts of *Heliconia*.

Calathea lutea,
Naranjo-Sa'al
area of PNYNN.
Photos by
Nicholas
Hellmuth.



Chapter 2

Calathea lutea in the swamp vegetation of the Savanna of 3 Fern Species



Of the more than two-dozen savannas that we have documented in PNLT and the several in PNYNN, this Savanna of 3 Fern Species is the most unusual, with plants that are totally unexpected. We have several FLAAR publications that show the different areas. What you see here is the western side—here is the tallest vegetation.

Park ranger Teco at the left (Moises Daniel Perez Diaz). Nicholas Hellmuth deep into the ferns at the right.

Teco is taking snapshots of the bracts and flowers of the tall *Calathea lutea*.

Lots of savannas in the RBM have a ring of ferns around the edges of the savanna because most of these savannas have a ring-of-water. At the height of the dry season many savanna rings-of-water have no standing water, but are moist more of the year than the inside of the savanna. So ferns love to grow around the edges of savannas. Poza Maya (a Maya-made area now a savanna) is ringed by giant ferns which are edible. The ferns here west then north of the end of the Lake Yaxha are a different, smaller species.





Banana trees also have lots of brown leaves that have wilted and turn downwards. Fresh young green leaves grow Upwards.

These red-orange, brown-red towers of bracts attract the most attention.

The *Heliconia* bracts are equally amazing, but there are not many *Heliconia* in PNYNN—but there are thousands in Izabal and lots in Alta Verapaz and other parts of Guatemala.



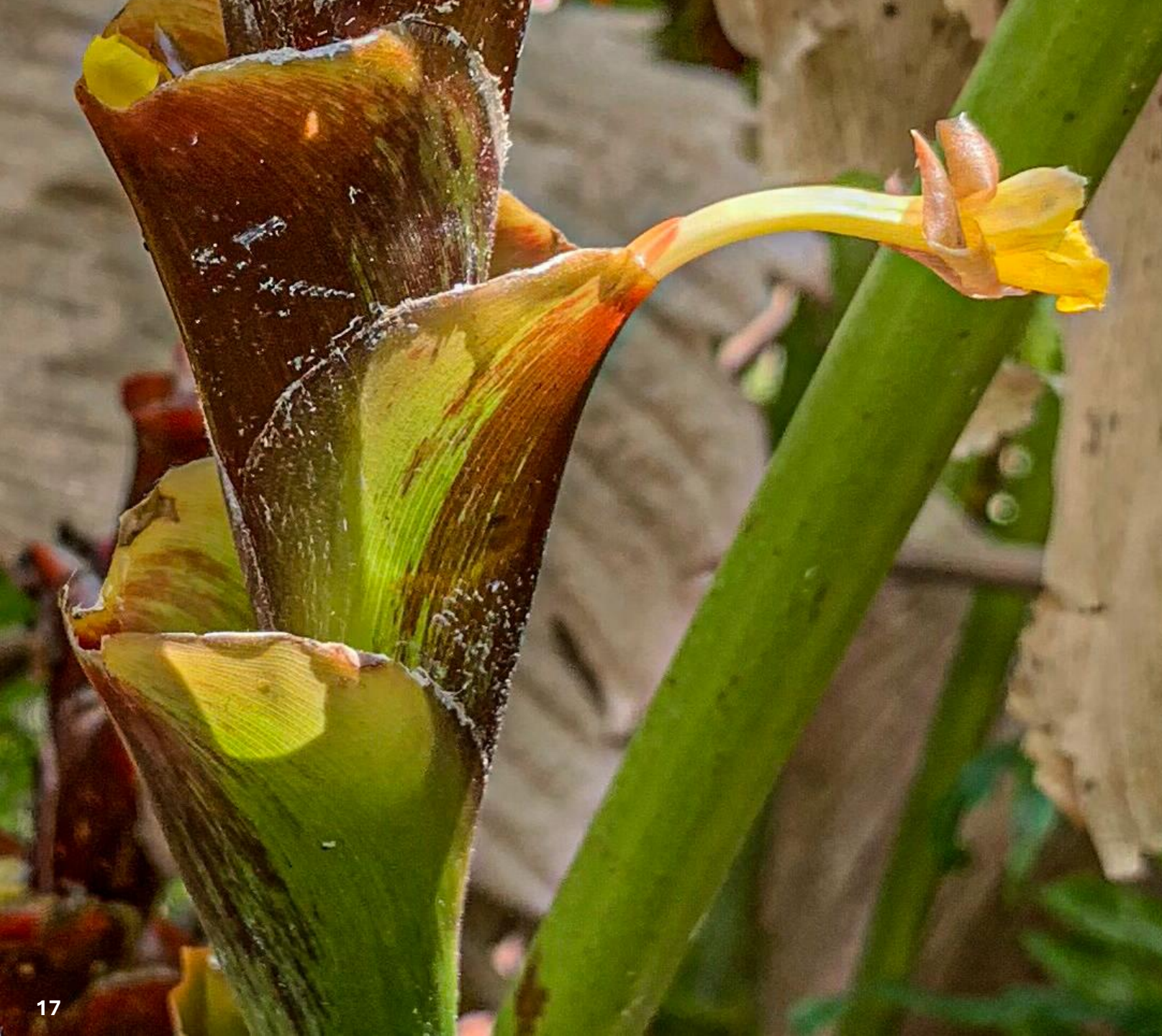


Bracts have open spaces where the flowers issue out upwards.

These bracts seem to have evolved to have flowers issue outwards in all directions—to be sure to attract pollinators.

“While orchid bees are believed to be the main pollinators of *C. lutea*, butterflies have been observed to steal nectar without pollinating the flowers... hummingbird...*T. ruckeri* does not pollinate these flowers, but acts as a nectar robber. The hummingbird pierces the sides of the corollae of fresh flowers with its beak and subsequently removes all nectar without touching the reproductive parts of the flowers.” (Etl et al. 2019: 183).





Now you can see the yellow flower arching out of the inside of the bract.

Amazing that even an early iPhone Xs (from many years ago) was capable of taking photos (with no tripod to hold it stable) that a segment of a large photo (on previous page) can be enlarged to show the yellow flower on the present page.

Today, the Google Pixel 10XL and the iPhone 17 ProMax are significantly better and we will be taking both to Yaxha for our next year 2025 field trip to PNYNN.

Chapter 3

Learning about using LEAVES to wrap food instead of using PLASTIC: *Calathea lutea*

Calathea lutea (Aubl.) G. F. W. Meyer, Prim. Fl. Esseq. 10. 1818. *Maranta lutea* Aubl. Pl. Guian. 3. 1775. *C. discolor* G. F. W. Meyer, op. cit. 7. Hoja de sal; Maxan, Moxan (Quecchi and Maya); Hoja de cuero; Platanillo.

Wet forest or open or forested swamps and marshes, 300 meters or less, but often planted at higher elevations; Peten; Alta Verapaz; Izabal; Escuintla; Suchitepequez ; Retalhuleu; Quiche; probably in all the Pacific coast departments. Southern Mexico; British Honduras to Panama; southward to Peru; West Indies.

Plants large and coarse, often 3 meters high or more; leaves large, on very long petioles, the callus often 13 cm. long, glabrous; leaf blades often more than a meter long and 60 cm. wide but mostly smaller, elliptic or oval, usually rounded and apiculate at the apex, rounded at the base, thick and stiff, glabrous, pruinose beneath but the pale coat often deciduous in large sheets; scapes bearing one or more leaves, the spikes slightly compressed, numerous, often 20 cm. long; bracts numerous, mostly dark reddish brown, broad, 4 cm. long, coriaceous and very hard, distichous, glabrous or nearly so; ovary villous at the base; sepals linear, obtuse, 1 cm. long; corolla pale yellow, the tube almost 3 cm. long, the lobes elliptic, 1.5 cm. long, sericeous; outer staminode pale yellow, obovate, 2 cm. long; capsule usually 1-seeded; seed 8 mm. long, grayish castaneous, the aril white.

Called "bijao" in Honduras. Although growing most often in open swamps, this plant grows perfectly well in well drained soil, and sometimes grows naturally on open hillsides in regions of heavy and continuous rainfall. It is of great economic importance in Guatemala, especially along the Pacific foothills, where it often is planted on a large scale. In some places from Retalhuleu to Escuintla there are good-sized fields, with the plants set in rows. Great

quantities of the leaves are gathered, piled flat, and tied in large bunches, which are transported to all parts of the country, and are to be seen in almost all the markets. They serve in place of paper for wrapping all kinds of articles, especially salt and soap. Banana leaves when green are much used as temporary wrappers but when dry they are altogether useless. *Calathea* leaves are tough, and serve very well for this purpose. They are much used, too, as thatch on small temporary structures.

(Standley and Steyermark 1952: 212-214).

These are the leaves of *Calathea lutea* that can be used to wrap food in markets.

It's well known that lots of different leaves are used to wrap tamales and corn bread (tamale with no meat), that I ate for Christmas meal in the Q'eqchi' Maya home of Senaida Ba in Chipemech, Alta Verapaz, several years ago).

But if you dedicate years of field work to rural areas of Guatemala, you see markets where lots of the products are wrapped in leaves and not in plastic.



Introduction to the potential of eco-friendly leaves

Around the world people are working to find substitutes for plastic. Already several thousand years ago the Classic Maya used leaves of several species of plant family Marantaceae to wrap tamales and other things. Heliconia leaves have also been used for thousands of years to wrap materials (plant family Heliconiaceae, native relative of banana which is not native). I have even seen Mayan markets in rural areas with modern products wrapped in Heliconia leaves or banana leaves. Helpful information on Q'eqchi' Mayan use of plant leaves is now available from Abigail Cabnal (Senahu, Alta Verapaz) and Senaida Ba (Senahu and Chipemech, Alta Verapaz).

Three species of large-leaf plants of family Marantaceae have been located and photographed at Yaxha (PNYNN). I am checking to see whether a fourth species, *Calathea crotalifera* S.Watson, was also found and photographed in this national park (so far it is not listed for Peten).

We at FLAAR Mesoamerica (Guatemala) and FLAAR (USA) are inspired to do research and field work to find native plants of Guatemala that can be reinstated into the modern world to replace chemical, plastic, and factory-produced modern eco-unfriendly products (plastic being the most eco-damaging).

By finding plants within Parque Nacional Yaxha Nakum Naranjo that have utilitarian benefits and are also biodegradable, we can do further research to learn where these plants can be planted outside the park to help local people earn income to support their families. There are several companies around the world making plates and plate-like objects by pressing or heat-pressing leaves. I am curious whether any of the leaves of plants of the family Marantaceae and Heliconia can become known in Peten for these biodegradable ecofriendly uses.

Three species of Heliconia are along the Arroyo Petexbatun near Sayaxche (we found these in a single day in mid-October). Plant lists for Tikal list eight species (Neotropical Flora web site). So we estimate that we can find several more species of Heliconia within the diverse ecosystems of PNYNN. So far we have not noticed many in bloom, but with more field work surely we will find more Heliconia in PNYNN if eight are between Remate and Uaxactun (including Tikal).

Utilitarian plants of Family Marantaceae located and photographed in Parque Nacional Yaxha Nakum Naranjo	
Common names	Marantaceae
Hoja de sal, Rattle Snake Plant,	<i>Calathea crotalifera</i> S.Watson
Hoja de sal, bijao, maxan	<i>Calathea lutea</i> (Aubl.) E.Mey ex Schult.
Arrowroot, edible flour, maranta	<i>Maranta arundinacea</i> L.
bent alligator-flag, arrowroot, or fire-flag	<i>Thalia geniculata</i> L.

Date photographed	Genus species	Location
26 mar 2019	<i>Calathea lutea</i>	Laguna la Perdida
4 jun 2019	<i>Calathea lutea</i>	Laguna la Perdida
9 jul 2019	<i>Calathea lutea</i>	Isla de Topoxte

Photographs of *Calathea lutea*

We found more areas with *Calathea lutea* than any other of the family Marantaceae, probably because this is one of the tallest plants of the family and has inflorescences of photogenic shape.

This plant clearly likes the ground to be wet many months of the year.

Calathea lutea (Aubl.) G. Mey. —**Loc Use:** FOOD, MED. — **Reg Use:** FOOD, PRD. — **Nv:** hoja del sal, mu-shan, wahá, waha leaf. (Balick, Nee and Atha 2000: 178).

Calathea lutea Schult. CAM, CHIS, OAX, QROO, TAB, VER (Villasenor 798).

Chapter 4

Calathea crotalifera

***Calalea crotalifera* is found in Izabal, Alta Verapaz, and Belize**

This large-leaf heliconia-like plant is found in humid areas of Mesoamerica. Standley and Steyermark list where they knew of it in 1952 (page 212). Peten is not in their list.

Suzanne Cook lists *Calathea crotalifera* for the Lacandon area of Chiapas (2016: 168), but gives no use for it. Surely other authors list it for Tabasco.

Lundell lists only *Calathea lutea* in his book on The Vegetation of Peten (1937: 56, 107, 163).

FLAAR team has photographed *Calathea crotalifera* in Izabal and in Alta Verapaz

Norma photographed a stand of *Calathea crotalifera* near her home in Alta Verapaz. We also found and photographed *Calathea crotalifera* in Macho Creek area of Izabal. For illustrations the focus in the present FLAAR Reports are examples of the only species of *Calathea* that we have found, so far, from PNYNN, RBM, Peten– *Calathea lutea*. But we highly recommend that an energetic student consider a PhD dissertation on all the *Calathea* species of Guatemala.

Chapter 5

Learning about other EDIBLE species of genus *Calathea*

Calathea allouia is nowadays considered a synonym of accepted name *Goeppertia allouia*. BUT... lots of botanical databases show only *Calathea allouia*. Although *Calathea allouia* is not yet documented for Peten, it is found in the Maya Highlands so was available to the Maya as food that does not require slash-and-burn milpa deforestation.

Calathea Allouia (Aubl.) Lindl. Bot. Reg. 14: sub pi. 1210. 1828. *Maranta Allouia* Aubl. PL Guian. 3. 1775. *C. macrosepala* Schum. Pflanzenreich IV. 48: 83. 1902. *Phrynium violaceum* Roscoe, Monandr. PL pi. 37. 1828. *C. violacea* Lindl. Bot. Reg. 11: sub pi. 932. 1825. *C. Allouia* var. *violacea* Woodson, Ann. Mo. Bot. Gard. 29 : 332. 1942. Mox, Max (Coban, Quecchi); Chufle; Platanillo.

Moist or wet, mixed forest, 1,400 meters or less, most frequent at low elevations; Izabal; Zacapa; Santa Rosa; Escuintla; Sacatepequez; Suchitepequez; Huehuetenango. Southern Mexico; British Honduras to Panama; West Indies; northern South America.

Plants large and coarse, 1-1.5 meters high, glabrous, the slender roots terminating in small tubers; radical leaves long-petiolate, the petioles slender, the callus 2 cm. long, puberulent above or glabrous; leaf blades oblong or ovate-oblong, somewhat inequilateral, short-acuminate, as much as 60 cm. long and 20 cm. wide, rounded at the base, thin, slightly paler beneath; scape bearing a single leaf similar to the basal ones and long-petiolate; flower spike ellipsoid, 5-10 cm. long, longpedunculate, the peduncles short-pilose; bracts green, membranaceous, numerous, spirally arranged, 2 cm. long, rounded at the apex, glabrous or sparsely appressedhirtellous; bractlets 12 mm. long, lanceolate; ovary villous at the apex; sepals lanceolate, obtuse, 8 mm. long; corolla pale yellow or whitish, the tube 2.5 cm. long, hirsute, the lobes oblong-lanceolate, 1 cm. long; outer staminode white, 12 mm. long, obovate, 2-lobate; capsule turbinate, 8 mm. long, stramineous, the exocarp crustaceous; seeds trigonous, sulcate, grayish yellow.

The young tender flower spikes are cooked and eaten commonly in Guatemala as well as in other parts of Central America. They are seen frequently in the lowland markets. It is reported that in the West Indies the tubers borne on the roots are cooked and eaten, but we have no data to the effect that they are utilized in Central America. About Coban and elsewhere the leaves are much used for wrapping tamales and other foods. The nerves of the leaves leave their impression upon the tamalitos, and this pattern is much admired. The leaves remain soft and pliable, unlike those of some other species, and have no unpleasant flavor. In some localities of the Pacific bocacosta the cultivation of this and other *Calatheas* for their leaves is an agricultural operation second only to the growing of maize. In Salvador the plant is sometimes called "macus." Var. *violacea* is a form differing only in its purplish corollas. It is common in Panama but probably does not extend so far north as Guatemala. (Standley and Steyermark 1952: 209).

Balick, Nee and Atha list two species of genus *Calathea* as edible and as medicine:

Calathea crotalifera S. Watson — **Syn:** *Calathea insignis* Petersen — **Loc Use:** MED, FOOD. — **Nv:** wah, wahá, waha-leaf. — **Habit:** Herb.

Calathea inocephala (Kuntze) H.A. Kennedy & Nicolson — **Habit:** Herb. — **Note:** *Calathea altissima* (Poepp. & Endl.) Körn., misapplied.

Calathea lutea (Aubl.) G. Mey. — **Loc Use:** FOOD, MED. — **Reg Use:** FOOD, PRD. — **Nv:** hoja del sal, mu-shan, wahá, waha leaf. — **Habit:** Herb.

Calathea macrosepala K. Schum. var. ***macrosepala*** — **Habit:** Herb. — **Note:** *Calathea allouia* (Aubl.) Lindl., misapplied.

Calathea marantifolia Standl. — **Nv:** waha-leaf. — **Habit:** Herb.

Calathea micans (Mathieu) Körn. — **Habit:** Herb. — **Note:** *Calathea microcephala* (Poepp. & Endl.) Körn., misapplied.

These six species are in Belize. There are 15 species listed for Mexico (Villaseñor 2016: 798). Portal de Biodiversidad de Guatemala lists the following six species for Guatemala:

Calathea crotalifera, Alta Verapaz, El Quiche, Escuintla, Huehuetenango, Izabal, Retalhuleu, Solola, Suchitepéquez

Calathea insignis, Alta Verapaz, Chiquimula, Huehuetenango

Calathea lutea, Peten, Alta Verapaz, Escuintla, Izabal

Calathea macrosepala var. *macrosepala*, Suchitepéquez

Calathea oscariana, Alta Verapaz, Chiquimula, Quetzaltenango

Calathea sclerobractea, Chiquimula

So, *Calathea crotalifera* is not listed for Peten (but there are other herbaria databases that also need to be checked). Lundell lists *Calathea lutea* for Tikal (1937: 56). Since the leaves of *C. lutea* are used to wrap tamales, they are often planted in kitchen gardens (so not wild in that area, and then they often escape). Standley and Steyermark list other names because lots of old names are now just synonyms.

References Cited and Additional Suggested Reading on *Calathea*

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.

BREEDLOVE, D. E.

1986 Flora de Chiapas. *Listados Floríst. México* 4: i–v, 1–246.

COOK, Suzanne

2016 The Forest of the Lacandon Maya: An Ethnobotanical Guide. Springer. XXVII and 379 pages.

COWAN, C. P.

1983 Flora de Tabasco. *Listados Floríst. México* 1: 1–123.

ETL, Florian BRANDAUER, S. Sophie; BRANDAUER, Philipp; PRADER, Sigrid; NEIER, Valerie; DÖTTERL, Stefan and Jürg SCHÖNENBERGER

2019 Flower visitors of *Calathea lutea* (Marantaceae): The role of the hummingbird *Threnetes ruckeri*. *Acta ZooBot Austria* 156, 2019, 183–196.

KENNEDY, Helen

1978 Systematics and Pollination of the "Closed Flowered" Species of *Calathea* (Marantaceae). University of California Press.

LUNDELL, Cyrus Longworth

1937 The Vegetation of Peten. *Carnegie Institution Washington Publication* No. 478. 244 pages.

STANDLEY, Paul C. and STEYERMARK

1952 Flora of Guatemala. Vol. 24, Part III. Chicago Natural History Museum. 431 pages.

VILLASEÑOR, José Luis

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

Acknowledgements and Appreciation

FOR COOPERATION, HOSPITALITY, AND ASSISTANCE AT PARQUE NACIONAL YAXHA, NAKUM AND NARANJO PROJECT (August 2018 through July 2019)

Ing. Jorge Mario Vásquez Kilkán (CONAP, Santa Elena, Peten)

Arq. Jose Leonel Ziesse Altán (IDAEH, Santa Elena, Peten)

Biolg. Ana Lorena Lobos Morales (CONAP)

INITIATION AND COORDINATION OF THE PROJECT OF COOPERATION FOR 2021-2025

Licda. Merle Fernandez, CONAP

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

Licda. Ana Luisa De León N., Directora de Educación para el Desarrollo Sostenible, CONAP

Ing. Sergio Alejandro Rolando Balan, Director Regional, CONAP, Peten

Ing. Jorge Mario Vásquez Kilkán (CONAP, Santa Elena, Peten)

Lic. Lester Ely García González, Coordinador Administrativo de Yaxhá para el Ministerio de Cultura y Deportes

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

FOR COOPERATION, HOSPITALITY, AND ASSISTANCE AT PARQUE NACIONAL YAXHA, 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.

ASSISTANCE FOR KNOWLEDGE OF PLANTS AND ANIMALS OF PNYNN

Teco, Moises Daniel Perez Diaz, park ranger, PNYNN

TARPS TO COVER AND PROTECT EQUIPMENT IN THE BACK OF OUR PICKUP TRUCK—AND TARPS TO COVER OUR TENT CAMPING AREA WHILE CAMPING IN REMOTE AREAS

We sincerely thank Mr. 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 during these years we worked with the 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, 2021-2025, 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.

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. www.elsombreroecolodge.com/en-us

Donations make our Field Trips and Research and Publications Possible

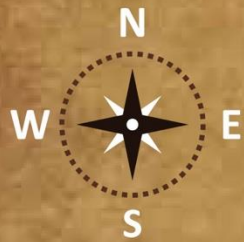
We appreciate a donation during November 2021 to help cover the costs of FLAAR research projects specifically to assist and support the current FLAAR project of flora and fauna in the Reserva de la Biosfera Maya (RBM). This donation also assisted the FLAAR (USA) and FLAAR Mesoamerica (Guatemala) research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



HOW TO GET TO YAXHA?

MAP SYMBOLS



Archaeological sites



Airports



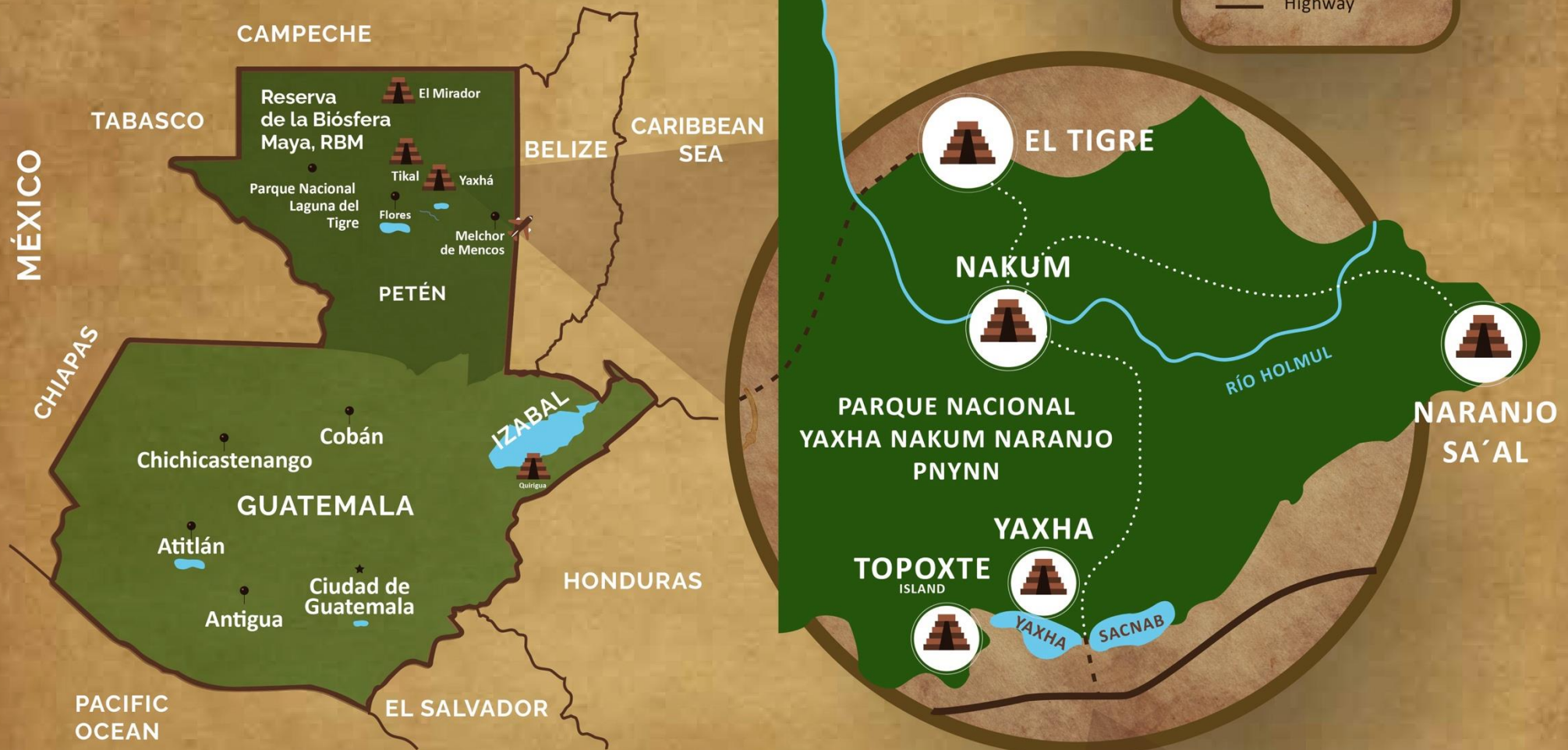
Dirt or gravel road



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.

Acknowledgements and Appreciation

The design of this FLAAR Reports is horizontal for several reasons: so horizontal photos can be shown at larger size so you can see the detail; and so we can put two vertical photos on the same page. A horizontal format is easier to look at on a computer monitor. Plus this PDF can be presented in a classroom at this helpful horizontal format. This original design is by Nicholas Hellmuth, additional design concepts are by Valeria Aviles Diaz (FLAAR Mesoamerica). The pages were numbered by student intern Maria Fernanda Solares Garrido and the front covers of the thirteen publications of the series were organized by her and fellow student interns.

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



FLAAR
MESOAMERICA



