



**FLAAR**  
MESOAMÉRICA

**WETLANDS #18**

# **ANONA DE MANGLAR**

— ALLIGATOR OR POND APPLE —

*Annona glabra*



**Caribbean Wetlands  
of Livingston**

**NICHOLAS HELLMUTH**

# ANONA DE MANGLAR

— ALLIGATOR OR POND APPLE —

*Annona glabra*

Municipio de Livingston,  
Izabal Guatemala

MARCH 2022



## CREDITS

The helpful individuals listed below are all part of the FLAAR Mesoamerica research and field work team. The office research team, webmaster, and web designers are additional individuals in the main office in Guatemala City. Since each report is a different plant or animal, the individuals who assist in preparing the bibliography, species identification and botanical information are not the same for each report.

### Authors

Nicholas Hellmuth  
Diana Sandoval

### Compilation of Basic Data From Earlier Botanists

Diana Sandoval

### Plant Identification Team

Victor Mendoza

### Photographers

Nicholas Hellmuth  
María Alejandra Guitiérrez

### Editors

Vivian Diaz  
Alejandra Valenzuela

### Manager of Design and Layout

Andrea Sánchez Díaz

### Layout of this English Edition

Heidy Galindo

## APPRECIATION

### Assistance for local Access, Municipio de Livingston

Daniel Esaú Pinto Peña, Alcalde of Livingston (Izabal, Guatemala).

### Initiation of the Project of Cooperation, February and March 2020

Edwin Marmol Quiñonez, Coordinator of Livingston Cooperation (Izabal, Guatemala).

### Lanchero and Guide

Keneth William De La Cruz.  
Omar Suchite.

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### FRONT COVER PHOTOGRAPH

#### *Annona glabra.*

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Jun. 19, 2021, 8:58 a.m. Rio Dulce, Livingston, Izabal. Camera: Nikon D5. Lens: Nikon AF-Micro-NIKKOR 200mm IF-ED Macro. Settings: 1/320 sec; f/14; ISO 2,000.

### TITLE PAGE PHOTOGRAPH

#### *Annona glabra.*

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Jun. 19, 2021, 2:18 p.m. Rio Dulce, Livingston, Izabal. Camera: iPhone 12 Pro Max.



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## Edible Wetlands Plants of Municipio de Livingston, Izabal

Wetland Series 1: from Swamps, Marshes and Seasonally Inundated Flatlands of Izabal



### Wetland Series 2: plants that grow along the beach shore of Amatique Bay



### Wetland Series 3: plants that grow alongside water: rivers, lagoons, swamps, or ocean





***Annona glabra.***

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Jun. 19, 2021, 8:58 a.m. Rio Dulce, Livingston, Izabal.  
Camera: Nikon D5. Lens: Nikon AF-Micro-NIKKOR 200mm IF-ED Macro. Settings: 1/320 sec; f/14; ISO 2,000.

## INTRODUCTION TO ***ANNONA GLABRA* OF GUATEMALA**

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*Annona glabra* fruits are edible. This tree grows in swamps, along the sides of rivers and creeks (especially with brackish water such as in the Municipio de Livingston, the east part of Izabal, Guatemala).

*Annona glabra* is also listed as growing in Campeche, Chiapas, Quintana Roo, Tabasco, and Yucatan (so all around Guatemala and Belize). Villaseñor also lists *Annona glabra* for COL, GRO, JAL, NAY, OAX, TAMS, VER (2016: 603).

*Annona glabra* is known to be edible but there are so many other species of *Annona* that have larger fruits that are more tasty, that *Annona glabra* does not get much attention. Yet, we found these trees in many locations of the east half of Izabal, Guatemala. Here are a few examples:

- Río Dulce, Jan 19, 2021, fruits
- Río Pajuil, El Golfete, Mar 25, 2021
- Playa Aldea Buena Vista, Tapón Creek, Apr 25, 2021
- Río Rosul, Río Dulce, Jun, 19 2021, fruits
- Playa Quehueche, facing Amatique Bay, July 20, 2021

These trees would have been available thousands of years ago for the Classic Maya to eat. And more importantly, available to the pre-Mayan people who lived along the coasts.



## MY PERSONAL EXPERIENCE **WITH *ANNONA GLABRA***

I know lots of other *Annona* fruits from exploring Mayan markets in small towns in remote areas of Guatemala. I have seen and photographed lots of other species of *Annona* fruits at Frutas del Mundo of Dwight Carter (Izabal, Guatemala). But I was not familiar with *Annona glabra* since my experience is primarily in Petén and all adjacent areas. I have not done work along the coasts prior to our year 2020-2021 field work project in the east part of the Municipio de Livingston, Izabal.

Once I began seeing the fruits on so many rivers and coastal areas, I realized this tree and its edible fruits deserved to be rescued from obscurity. So, in the present FLAAR report we show photographs and provide basic botanical and ethnobotanical documentation on *Annona glabra*.



***Annona glabra.***

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Jun. 19, 2021, 2:17 p.m. Rio Rosul, Rio Dulce, Livingston, Izabal. Camera: Nikon D5. Lens: Nikon AF-Micro-NIKKOR 200mm IF-ED Macro. Settings: 1/320 sec; f/13; ISO 3,200.

## FULL BOTANICAL NAME

- *Annona glabra* L.

## MAYAN NAMES FOR **ANNONA GLABRA**

- mak', mak'che' (maya yucateco)

## HERE ARE SYNONYMS **FOR ANNONA GLABRA**

*Annona australis* A.St.-Hil.

*Annona chrysocarpa* Lepr. ex Guill. & Perr.

*Annona chrysocarpa* Leprieur Ex Guillemet

*Annona klainei* Pierre ex Engl. & Diels

*Annona klainii* Pierre ex Engl. & Diels

*Annona klainii* var. *moandensis* De Wild.

*Annona laurifolia* Dunal

*Annona palustris* L. Synonym

*Annona palustris* var. *grandifolia* Mart.

*Annona peruviana* Humb. & Bonpl. ex Dunal

*Annona uliginosa* Kunth

*Asimina arborea* Raf.

*Guanabanus palustris* M. Gómez



### ***Annona glabra***.

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Jun. 19, 2021, 8:59 a.m. Rio Rosul, Rio Dulce, Livingston, Izabal. Camera: iPhone 12 Pro Max.

<http://www.theplantlist.org/>



*Annona glabra.*

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Jul. 19, 2021, 2:17 a.m. Playa Quehueche, Livingston, Izabal.  
Camera: Nikon D5. Lens: Nikon AF-Micro-NIKKOR 200mm IF-ED Macro. Settings: 1/320 sec; f/13; ISO 200.



***Annona glabra***. At the left side you can see the *Annona* tree with a fruit hanging. Also you can see the environment and other trees growing next to the river.

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Jun. 19, 2021, 8:59 a.m. Rio Rosul, Rio Dulce, Livingston, Izabal.  
Camera: iPhone 12 Pro Max.

## HOW MANY OTHER PLANTS OF GUATEMALA **HAVE THE SAME SPANISH NAME?**

Other species of *Annona* receive the same name

## HABITAT, IN WHAT ECOSYSTEM(S) CAN YOU **FIND NATIVE *ANNONA GLABRA*?**

Wetland vegetation, lowland evergreen forests floodable.

In floodable soils and riverbanks, it tolerates salinity. In warm weather.

[https://revivemx.org/Fototeca/Arboles/Annona\\_glabra/8\\_Fichas\\_de\\_venta/Anona\\_v2.pdf](https://revivemx.org/Fototeca/Arboles/Annona_glabra/8_Fichas_de_venta/Anona_v2.pdf)

## LOCAL NAMES FOR ***ANNONA GLABRA***

- Anona, Anonillo, Anona de manglar, palo de corcho

## **HABIT**

- Tree

## BOTANICAL DESCRIPTION OF *ANNONA GLABRA* IN STANDLEY AND CO-AUTHORS CHICAGO BOTANICAL MONOGRAPHS

***Annona glabra*** L. Sp. Pl. 537. 1753. *A. palustris* L. Sp. Pl. ed.  
2. 757. 1762. Anonillo (Izabal).

Wet thickets or usually in swamps, often in mangrove swamps, at or near sea level; Izabal. Southern Mexico to British Honduras and Panama; southern Florida; West Indies; widely distributed in South America; western Africa. A shrub or small tree, sometimes 10 meters tall, the trunk rarely 50 cm. in diameter, often somewhat enlarged or buttressed at the base, the bark thin, reddish brown; branchlets glabrous; leaves short-petiolate, papyraceous, bright green, ovate-elliptic to oblong-elliptic, 7-14 cm. long, 3-8 cm. wide, short-acute or sometimes obtuse, rounded or obtuse at the base, glabrous; flowers solitary, arising below the petioles, the pedicels 1.5-2 cm. long, glabrous, bracteolate above the base; sepals rounded, apiculate, glabrous, 3-5 mm. long; petals glabrous outside, the outer ones ovate, 2.5-3 cm. long, the inner ones somewhat smaller; fruit globose-ovoid, 5-12 cm. long, smooth, yellowish at maturity, the pulp cream colored. Names applied to the species in neighboring regions are "corkwood," "alligator apple," "bobwood" (British Honduras); "anona" (Honduras); "corcho" (Tabasco); "xmaac," "xmac" (Yucatan, Maya). The wood is brown, soft, and weak. It is often utilized along the Atlantic coast of Central America for bottle stoppers and floats for fishing nets and lines. The fruit is insipid and seldom eaten by people but there is a popular belief, perhaps correct, that it is eaten commonly by alligators.

(Standley and Steyermark 1958)

## BRIEF LIST OF *ANNONA GLABRA* FOR BELIZE BY STANDLEY AND RECORD (1936)

***Annona glabra*** L. Corkwood, Alligator Apple, Bobwood. Xmak (Yucatan, Maya). Widely distributed in tropical America; growing usually along streams, or often in coastal thickets. A small, glabrous tree; fruit small, ovoid, yellow at maturity. The fruit is scarcely edible.

(Standley and Record 1936: 135).

## ANNONA GLABRA IN BELIZE (BALICK, NEE AND ATHA 2000)

***Annona glabra* L.** — Ref: FG 4: 275. 1946. — Loc Use: CNST. — Reg Use: MED, PRD, FOOD, POIS. — Nv: alligator apple, bobwood, corkwood, yobapple. — Habit: Shrub or tree. — Voucher: Gentle 1931; Holmes 4640; Schipp 559.

(Balick, Nee and Atha 2000: 34)

## ANNONA GLABRA MENTIONED IN TREES AND SHRUBS OF MEXICO, STANDLEY

***Annona glabra* L.** Sp. Pl. 537. 1753. *Annona palnstris* L. Sp. Pl. ed. 2. 757. 1762. Veracruz and Guerrero, in wet soil; reported from Yucatan, Tabasco, and Oaxaca. Widely distributed in tropical America; type from the Bahamas. Shrub or tree, sometimes 12 meters high, the trunk as much as 50 cm. in diameter, often swollen or with buttresses at the base, the bark thin, reddish brown; leaves oval, oblong, or ovate, 6 to 15 cm. long, deep green, acute or acuminate; outer petals yellowish, with a deep red spot near the base; fruit 5 to 12 cm. long, ovoid, smooth, yellowish at maturity, with cream-colored pulp; wood brown, soft, weak, its specific gravity about 0.50. "Corcho" (Guerrero, Tabasco, Yucatan, Porto Rico); "árbol de corcho" (Veracruz); "palo de corcho" (Yucatan); "mag" (Yucatan. Maya); "cayur," "corazón cimarron," "guanabano cimarron," "anon" (Porto Rico); "bagfi," "palo bobo" (Cuba); "anonillo" (Guatemala, Honduras); "guanábano de corcho"(Santo Domingo), The tree often grows about salt water, associated with mangroves. Its English names are "pond-apple," "alligator-apple," and "monkey-apple." The fruit is insipid but is said to be eaten in some localities, while in others it is regarded as poisonous. It is said to be eaten by the alligators that frequent the banks where it grows, hence the name "alligator-apple." The very light wood is used to make bottle corks and floats for fish nets.

(Standley 1922: 281).



***Annona glabra.***

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Jun. 19, 2021, 8:58 a.m. Rio Dulce, Livingston, Izabal.  
Camera: Nikon D5. Lens: Nikon AF-Micro-NIKKOR 200mm IF-ED Macro. Settings: 1/320 sec; f/14; ISO 2,000.



***Annona glabra.***

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Jul. 19, 2021, 2:17 a.m. Playa Quehueche, Livingston, Izabal.  
Camera: Nikon D5. Lens: Nikon AF-Micro-NIKKOR 200mm IF-ED Macro. Settings: 1/320 sec; f/13; ISO 200.





***Annona glabra.***

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Jul. 19, 2021, 2:17 a.m. Playa Quehueche, Livingston, Izabal.  
Camera: Nikon D5. Lens: Nikon AF-Micro-NIKKOR 200mm IF-ED Macro. Settings: 1/320 sec; f/13; ISO 2000.

## WHERE HAS *ANNONA GLABRA* BEEN FOUND IN THE MUNICIPIO OF LIVINGSTON?

- > **Is *Annona glabra* listed for Biotopo Protegido Chocón Machacas, CECON/USAC?**  
Only the genus *Annona* is mentioned but no species is specified (PEREZ-Consuegra 2001: 88).
- > **Is *Annona glabra* listed for Tapón Creek Nature Reserve (including Taponcito Creek), FUNDAECO?**  
Not mentioned.
- > **Is *Annona glabra* listed for Buena Vista Nature Reserve?**  
Not mentioned.
- > **Is *Annona glabra* listed for Cerro San Gil (south side of Río Dulce)?**  
Only the species *Annona primigenia* is mentioned (Ruíz 2006: 159).
- > **Is *Annona glabra* listed for Ecoalbergue Lagunita Creek (Área de Usos Múltiples Río Sarstún)?**  
*Annona glabra* is mentioned in the list of flora of the area (CONAP 2003: 26).
- > **Is *Annona glabra* listed for Sarstoon-Temash National Park (northern side of Río Sarstún)?**  
Only other species of the genus *Annona* are mentioned (Meerman, Herrera and Howe 2003: 1).
- > **Is *Annona glabra* listed for Refugio de Vida Silvestre Punta de Manabique?**  
*Annona glabra* is mentioned in the list of flora of the area (FUNDARY 2007: 112).
- > **Is *Annona glabra* listed for Bocas de Polochic?**  
Only the genus *Annona* is mentioned but no species is specified (FUNDAECO 2007: 38).
- > **Is *Annona glabra* from the Highlands or from the Lowlands (or both)?**  
*Annona glabra* is from lowlands from 0 to 500 meters above sea level.

## WORLD RANGE FOR **ANNONA GLABRA**

Native to the extreme southeastern United States (Florida peninsula), Caribbean islands, Mexico, Central and South America; and even present in the extreme west of Africa.

<https://www.naturalista.mx/taxa/69972-Annona-glabra>

## DOES *ANNONA GLABRA* ALSO GROW IN HOME GARDENS?

*Annona glabra* is used for the elaboration of grafts as rootstock because it has resistance to frostbite

(Irigoyen 2004: 11).

## USES OF **ANNONA GLABRA**

Fruit tree. Its leaves are used in traditional medicine. The flowers can be used as dewormers. The fruits are edible and contain bioactive substances that inhibit the development of cancer cells, so have pharmaceutical potential. It provides habitat and food for wildlife and its presence contributes to conservation of wetlands.

[https://revivemx.org/Fototeca/Arboles/Annona\\_glabra/8\\_Fichas\\_de\\_venta/Anona\\_v2.pdf](https://revivemx.org/Fototeca/Arboles/Annona_glabra/8_Fichas_de_venta/Anona_v2.pdf)

## IS THERE POTENTIAL MEDICINAL USAGE OF ***ANNONA GLABRA*** BY LOCAL PEOPLE?

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Yes, it has been proven that the traditional use of *A. glabra* and the alcoholic seed extract is a potent source of anticancer compounds that could be used pharmaceutically.

(Cochrane, Nair, Melnick, Resek and Ramachandran, 2008)

## ARE ANY PARTS OF *ANNONA GLABRA* EATEN BY MAMMALS?

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The fruits and leaves of *Annona glabra* are edible, but there is no information on a specific predator.

## CLOSE RELATIVE(S) OF ***ANNONA GLABRA***

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The genus *Annona* is thought to contain over 100 species, all shrubs or small trees, most native to the American tropics, and a few native to tropical Africa. *Annona glabra* is a wild species related to several commercially grown *Annona* species, including *Annona cherimola* (cherimoya), *Annona muricata* (soursop), *Annona reticulata* (custard apple or bullock's heart) and *Annona squamosa* (sugar apple). However, caution should be used when dealing with common names, and many are liberally or inconsistently used between the species above.

<https://www.cabi.org/isc/datasheet/5811>



***Annona glabra.***

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Jun. 20, 2021, 10:24 a.m. La Esmeralda, Río Dulce, Livingston, Izabal.  
Camera: Nikon D5. Lens: Nikon AF-Micro-NIKKOR 200mm IF-ED Macro. Settings: 1/250 sec; f/11; ISO 2,500.

## CONCLUDING DISCUSSION AND **SUMMARY ON *ANNONA GLABRA***

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If you are a Maya family hundreds of years ago, living in the Río Dulce, El Golfete, Amatique Bay area of the Caribbean part of eastern Guatemala it helps if local wild native trees produce edible fruits and provide medicine. Our goal is to find as many wild plants of wetlands, that are native to Mesoamerica, that have edible parts. Ever since the 1960's, more and more archaeologists, ethnobotanists, and ecologists have estimated that the slash-and-burn milpa agriculture of the current century is not the way the significantly larger Classic Maya population obtained food. Most monographs on food resources of forest gardens are based on the Peten-Belize area: the core of the Maya Lowlands. Not much attention is paid to the edible plants within mangrove swamp forests since there are no mangrove swamps where most forest garden and kitchen garden projects are being studied (other than on Río San Pedro, west of Parque Nacional Laguna del Tigre). Thus, it is no surprise that in the helpful botanical and ethnobotanical monograph, "The Maya Forest Garden" there are six species of *Annona* in the list (Nigh and Ford 2015:189) but no *Annona glabra*.

There are mangrove swamps all the way around the Peninsula of Yucatan, Belize, and Izabal. So there should be more information on *Annona glabra* available. In the meantime, since most of us Mayanists are raised on CIW style monographs that focus on Yucatan peninsula and Petén, it is pure luck that our team was asked to accomplish field work in the wetlands, mangrove swamps, and other biodiverse ecosystems of the east part of Izabal, Guatemala. So, plant by plant we are rescuing documentation about wild edible plants that are missing from all the helpful popular books on "The Maya Civilization".

At college I was told that "archaeology is to help us understand how people lived." But within a year I found out that archaeology = artifacts, art, architecture. Obviously it's the monumental architecture of pyramid-temples, palaces, acropolises, ballcourts that impress and amaze us archaeologists (and the general public). So I too was led down the trail to art, artifacts and architecture for my Harvard undergraduate thesis on the architecture of the pyramid I worked on at Tikal and all the artifacts within the royal burial crypt that I discovered, the Tomb of the Jade Jaguar. Then I went deep into Teotihuacan influence (for my MA thesis) and deep into iconography of water-related symbolism for my PhD dissertation. But in the recent 20 years, I prefer to add documentation on the biodiverse ecosystems that surrounded these remarkable ancient cities.

Then I went deep into Teotihuacan influence (for my MA thesis) and deep into iconography of water-related symbolism for my PhD dissertation. But in the recent 20 years, I prefer to add documentation on the biodiverse ecosystems that surrounded these remarkable ancient cities. And with the material our team at FLAAR produces, I hope we can assist professors in the current generation to add more to “archaeology” than just artifacts, art, and architecture. And for edible food, lots more than maize-beans-and-squash (and more than root crops and ramón). That said, I eat ramón seed every morning as an ingredient in my breakfast cereal, together with amaranth seed: a super food of the Aztec and Maya Highlands.

On the subject of edible plants of mangrove swamps, at least two species of mangroves of the Maya Lowlands have edible parts: red mangrove, *Rhizophora mangle* L. and black mangrove, *Avicennia nitida*. We have found both these species along the Amatique Bay coast of the Municipio de Livingston, Izabal, Guatemala. Lots of red mangrove everywhere; black mangrove is not as common but with the help of local Q’eqchi’ Mayan plant scouts we also found *Avicennia nitida*. I have been focused on monumental Maya architecture since visiting Palenque at age 16, so my high school thesis was on temples, palaces, and the main acropolis there. Also, in 1962 the INAH team accepted my offer to help them carry supplies hiking to Bonampak. But 60 years later, I prefer to learn about edible plants that I was never taught about in university years and to visit, in-person, biodiverse ecosystems that are not featured in books on the remarkable Classic Maya civilization. So *Annona glabra* is just one of dozens of wild edible plants of the swamps, marshes, lagoons, and river sides of Izabal.

### **CREDITS FOR PHOTO ON PAGE 23.**

#### ***Annona glabra.***

Photo by: María Alejandra Gutiérrez, FLAAR Mesoamerica, Jun. 19, 2021, 8:58 a.m. Aldea Buena Vista, Tapón Creek, Livingston, Izabal. Camera: Canon EOS-1D X Mark II. Lens: Canon EF 100mm Macro USM.

Settings: 1/8000 sec; f/5.6; ISO 8,000.



***Annona glabra.***

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Apr. 25, 2021, 8:58 a.m. Playa Aldea Buena Vista, Tapón Creek, Livingston, Izabal.  
Camera: Nikon D5. Lens: Nikon AF-Micro-NIKKOR 200mm IF-ED Macro. Settings: 1/320 sec; f/14; ISO 2,000.







***Annona glabra.***

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Jun. 19, 2021, 8:59 a.m. Rio Rosul, Rio Dulce, Livingston, Izabal.  
Camera: iPhone 12 Pro Max.

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### **STANDLEY, Paul C. and Samuel J. RECORD**

1936 The Forests and Flora of British Honduras. Field Museum of Natural History. Publication 350, Botanical Series Volume XII. 432 pages plus photographs.

### **STANDLEY, Paul C.**

1922 Trees and Shrubs of Mexico. Contributions from the United States National Herbarium, Volume 23, Part 2. Smithsonian Institution.

In this one monograph the species are not listed in alphabetical order, so it's a mental adventure finding the species you are looking for.

All monographs by Standley and co-authors can be easily found and downloaded. I would recommend finding the .pdf versions as they are easier to store, easier to copy, and easier to share with students and colleagues.

### **VILLASEÑOR, José Luis**

2016 Checklist of the native vascular plants of Mexico. Catálogo de las plantas vasculares nativas de México. Revista Mexicana de Biodiversidad 87 (2016) 559–902.

## HELPFUL WEB SITES FOR **ANY AND ALL PLANTS**

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There are several web sites that are helpful even though not of a university or botanical garden or government institute.

However, most popular web sites are copy-and-paste (a polite way of saying that their authors do not work out in the field, or even in a botanical garden). Many of these web sites are click bait (they make money when you buy stuff in the advertisements that are all along the sides and in wide banners also. So we prefer to focus on web sites that have reliable information.

<https://serv.biokic.asu.edu/neotrop/plantae/>

Neotropical Flora database. To start your search click on this page:

<https://serv.biokic.asu.edu/neotrop/plantae/collections/harvestparams.php>

<http://legacy.tropicos.org/NameSearch.aspx?projectid=3>

This is the main SEARCH page.

<https://plantidtools.fieldmuseum.org/pt/rrc/5582>

SEARCH page, but only for collection of the Field Museum herbarium, Chicago.

<https://fieldguides.fieldmuseum.org/guides?category=37>

These field guides are very helpful. Put in the Country (Guatemala) and you get eight photo albums.

<http://enciclovida.mx>

CONABIO. The video they show on their home page shows a wide range of flowers, pollinators, a snake and other animals. The videos of the insects are great.

[www.kew.org/science/tropamerica/imagetatabase/index.html](http://www.kew.org/science/tropamerica/imagetatabase/index.html)

Kew gardens in the UK is one of several botanical gardens that I have visited (also New York Botanical Gardens and Missouri Botanical Gardens (MOBOT), in St Louis, the botanical garden in Singapore and El Jardín Botánico, the open forest botanical garden in Guatemala City).

[www.ThePlantList.org](http://www.ThePlantList.org)

This is the most reliable botanical web site to find synonyms. In the recent year, only one plant had more synonyms on another botanical web site.

## WEB SITES SPECIFICALLY ON **ANNONA GLABRA**

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<https://www.cabi.org/isc/datasheet/5811>

Information

<https://catalogofloravalleaburra.eia.edu.co/species/332>

Botanical information and photo

[www.cicy.mx/sitios/flora%20digital/ficha\\_virtual.php?especie=692](http://www.cicy.mx/sitios/flora%20digital/ficha_virtual.php?especie=692)

General information

[www.crbio.cr:8080/neoportal-web/species/Annona%20glabra](http://www.crbio.cr:8080/neoportal-web/species/Annona%20glabra)

Information

[http://www.hear.org/pier/species/annona\\_glabra.htm](http://www.hear.org/pier/species/annona_glabra.htm)

Information

[www.monaconatureencyclopedia.com/annona-glabra/?lang=es](http://www.monaconatureencyclopedia.com/annona-glabra/?lang=es)

Information

<https://www.naturalista.mx/taxa/69972-Annona-glabra>

Map distribution and photos

[https://revivemx.org/Fototeca/Arboles/Annona\\_glabra/8\\_Fichas\\_de\\_venta/Anona\\_v2.pdf](https://revivemx.org/Fototeca/Arboles/Annona_glabra/8_Fichas_de_venta/Anona_v2.pdf)

Information

<http://webserv.fq.edu.uy/tematres/index.php?tema=173>

Medicine use

## ACKNOWLEDGEMENTS TO FLAAR MESOAMÉRICA

The reports are a joint production between the field trip team and the in-house office team. So here we wish to cite the full team:

**Flor de María Setina** is the office manager, overseeing all the diverse projects around the world (including FLAAR-REPORTS research on advanced wide-format digital inkjet printers, a worldwide project for over 20 years). We also utilize the inkjet prints to produce educational banners to donate to schools.

**Vivian Díaz** environmental engineer, is project manager for flora and fauna projects (which includes field work and the resulting reports that can be helpful for botanists, zoologists and ecologists, and for university students). She also coordinates activities at MayanToons, a FLAAR division where educational material for kids is prepared.

**Victor Mendoza** identifies plants, mushrooms, lichen, insects, and arachnids. When his university schedule allows, he also likes to participate in field trips on flora and fauna research.

**Vivian Hurtado** nowadays is getting involved in the coordination and development of Flora and Fauna projects. She is studying environmental engineering from Universidad Rafael Landívar.

**Sergio Jerez** prepares the bibliography of each topic and download the pertinent research material for our electronic library on flora and fauna. We all use these two downloads plus our internal library on Mesoamerican flora and fauna (México through Guatemala to Costa Rica). He also does plant identification and works on the processing of GPS coordinates to create maps of the routes traveled during our expeditions.

**Andrea de la Paz** is a designer who helps prepare the master-plan for aspects of our publications. She is our editorial art director.

**Norma Estefany Cho Cu** helps with preparing the camera equipment for each field trip and helps in the office (and on field trips) as a cook.

**Jaqueline González** is a designer who puts together the text and photographs to create the actual reports (we have several designers at work since we have multiple reports to produce).

**Roxana Leal** is the Social Media Manager for flora and fauna research and publications, as well as for the MayanToons educational book projects

**María Alejandra Gutiérrez** is an experienced photographer, especially with the Canon EOS 1D X Mark II camera and 5x macro lens which are useful to photographing tiny insects, tiny flowers, and tiny mushrooms. She is also involved in work during and after a field trip, which includes photo sorting, naming and processing, as well as the consequent report preparation.

**David Arrivillaga** is an experienced photographer able to handle both Nikon and the newest Sony digital cameras. His work during and after a field trip also includes sorting, naming, and processing.

**Juan Carlos Hernández** takes the material that we write and places it into the pertinent modern Internet software to produce our web pages (total network is read by over half a million people around the world).

**Paulo Núñez** is a webmaster, overlooking the multitude of web sites. Internet SEO changes every year, so we work together to evolve the format of our web sites.

**Valeria Áviles** is an illustrator for MayanToons, the division in charge of educational materials for schools, especially the Q'eqchi' Mayan schools in Alta Verapaz, Q'eqchi' and Petén Itzá Maya in Petén, and the Q'eqchi' Mayan and Garifuna schools in the municipality of Livingston, Izabal.

**Josefina Sequén** an illustrator for MayanToons and also helps prepare illustrations for Social Media posts and for animated videos.

**Rosa Sequén** is also an illustrator for MayanToons and also helps prepare illustrations for Social Media posts and for animated videos.

**Laura Morales** is preparing animated videos in MayanToons style since animated videos are the best way to help school children understand how to protect the fragile ecosystems and endangered species.

**Heidy Alejandra Galindo Setina** joined our design team in August 2020. She likes photography, drawing, painting, and design.

**Maria José Rabanales** she is part of the design team, which does the editing of every photographic report and educational material of Flora and Fauna. She works together with the other members of the design team to prepare the finished PDF editions of the material of the Yaxha, Nakum and Naranjo Project.

**Alejandra Valenzuela** biology student who is now part of our Flora and Fauna photographic report and educational material editing team

**Alexander Gudiel** is a designer who joined the editorial design team on December 2020. He will combine the text, pictures and maps into the PDF according to the FLAAR Mesoamerica editorial criteria.

**Cristina Ríos** a graphic designer student who joined the editorial design team on December 2020. She will combine the text, pictures and maps into the PDF according to FLAAR Mesoamerica editorial criteria.

**Byron Pacay** handles GPS mapping of where we hike or go in the lancha (boat) on each field trip day. He also lists where we stop to take photos and what each one of us is photographing to then prepare tabulations with this information.



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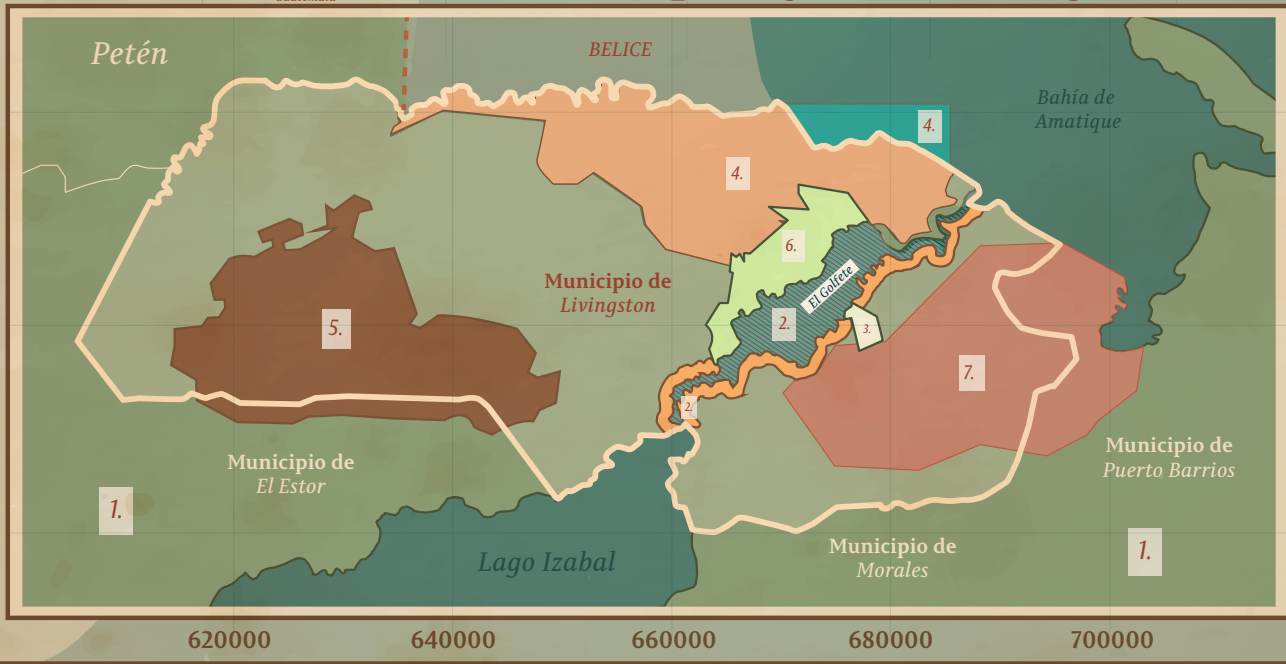
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### Áreas naturales protegidas de Livingston



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### Izabal

- 1. Área sin protección
- 2. Parque Nacional Río Dulce
- 3. El Higuerito
- 4. Área de Usos Múltiples Río Sarstún
- 5. Sierra de Santa Cruz
- 6. Biotopo Protegido Chocón Machacas
- 7. Reserva Protectora de Manantiales Cerro San Gil



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1748000



# Reserva Natural Tapón Creek, Livingston

## Bahía de Amatique

Área de Usos Múltiples  
Río Sarstún

Punta  
Cocolí

Aldea Buena  
Vista Tapon Creek

San Juan

Reserva Natural Tapón Creek  
Municipio de Livingston

Siete  
Altares

Finca  
Gangadiwali

Sarstún Creek

Taponcito  
Creek

El Rosario

San  
Martin

La Desmembración

Plan Grande  
Tatín

Área de Usos Múltiples  
Río Sarstún

Biotopo  
Chocón Machacas

El Golfete

Parque Nacional  
Río Dulce

Izabal



### Información de referencia:

- Límites departamentales de Guatemala. (IGN)
- Instituto Geográfico Nacional (IGN) (Hojas 2463 IV y 2463 III)
- Google Map data 2020. Shapes: Sistema Guatemalteco de Áreas Protegidas 2017.
- Cuerpos de agua. Ministerio de Agricultura Ganadería y Alimentación (MAGA)
- Dirección de Análisis Geoespacial del (CONAP), Marzo/2017.

Elaborado por: Andrea de la Paz; Amanda Estrada Rodas. FLAAR Mesoamerica 2020



## Edible Wetlands Plants of Municipio de Livingston, Izabal

Wetland Series 1: from Swamps, Marshes and Seasonally Inundated Flatlands of Izabal

<p><b>Cyperus esculentus</b></p> <p>Chufa, Yellow Nutsedge, Earth Almond</p> <p>MLW#1</p>	<p><b>Eleocharis geniculata</b> <b>Eleocharis caribaea</b></p> <p>Caribbean Spike-Rush</p> <p>MLW#2</p>	<p><b>Montrichardia arborescens</b></p> <p>Camotillo Water Chestnut</p> <p>MLW#3</p>	<p><b>Nymphoides indica</b></p> <p>Floating Heart Water Snowflake</p> <p>MLW#4</p>
<p><b>Pachira aquatica</b></p> <p>Zapoton</p> <p>MLW#5</p>	<p><b>Pontederia cordata</b></p> <p>Pickereel Weed</p> <p>MLW#6</p>	<p><b>Sagittaria latifolia</b></p> <p>Water Potatoes</p> <p>MLW#7</p>	<p><b>Typha dominguensis</b></p> <p>Cattail</p> <p>MLW#8</p>

Wetland Series 2: plants that grow along the beach shore of Amatique Bay

<p><b>Amphitecna latifolia</b></p> <p>Black calabash</p> <p>MLW#9</p>	<p><b>Coccoloba uvifera</b></p> <p>Uva del mar</p> <p>MLW#10</p>	<p><b>Manicaria saccifera</b></p> <p>Confra, Manaca</p> <p>MLW#11</p>	<p><b>Chrysobalanus icaco</b></p> <p>Coco Plum</p> <p>MLW#12</p>	<p><b>Avicennia germinans</b></p> <p>Black Mangrove</p> <p>MLW#13</p>	<p><b>Rhizophora mangle</b></p> <p>Red Mangrove</p> <p>MLW#14</p>
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Wetland Series 3: plants that grow alongside water: rivers, lagoons, swamps, or ocean

<p><b>Guadua longifolia</b></p> <p>Jimba</p> <p>MLW#15</p>	<p><b>Acoelorrhaphe wrightii</b></p> <p>Pimientillo, Tasiste, Palmetto Palm</p> <p>MLW#16</p>	<p><b>Acrostichum aureum</b></p> <p>Mangrove Fern</p> <p>MLW#17</p>	<p><b>Annona glabra</b></p> <p>Alligator Apple</p> <p>MLW#18</p>	<p><b>Bactris major</b></p> <p>Huiscoyol Palm</p> <p>MLW#19</p>	<p><b>Diospyros nigra</b></p> <p>Zapote negro</p> <p>MLW#20</p>
<p><b>Grias cauliflora</b></p> <p>Palo de Jawuilla</p> <p>MLW#21</p>	<p><b>Inga vera</b> <b>Inga multijuga</b> <b>Inga thibaudiana</b></p> <p>River Koko</p> <p>MLW#22</p>	<p><b>Pithecellobium lanceolatum</b></p> <p>Bastard Bully Tree Chucum Red Fowl</p> <p>MLW#23</p>	<p><b>Coccoloba belizensis</b></p> <p>Papaturro</p> <p>MLW#24</p>	<p><b>Symphonia globulifera</b></p> <p>Barillo</p> <p>MLW#25</p>	<p><b>Lacmellea standleyi</b></p> <p>Lechemiel</p> <p>MLW#26</p>

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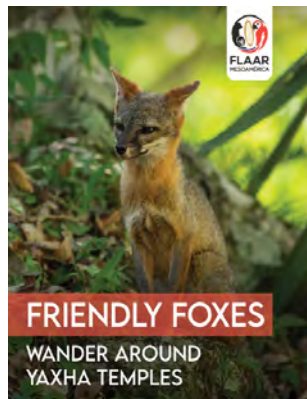
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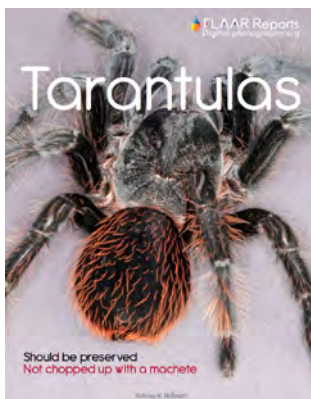
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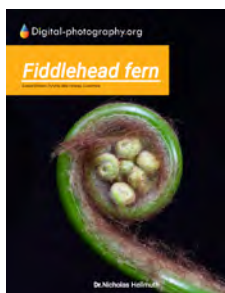
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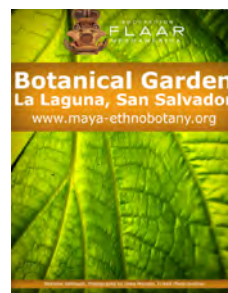
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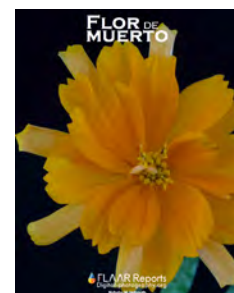
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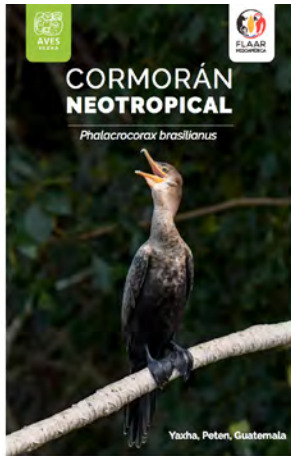
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DR. NICHOLAS HELLMUTH

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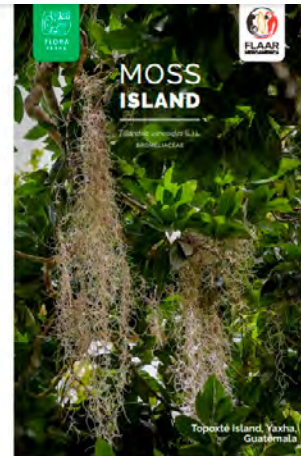
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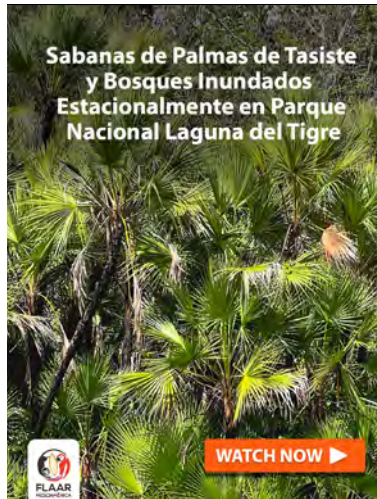
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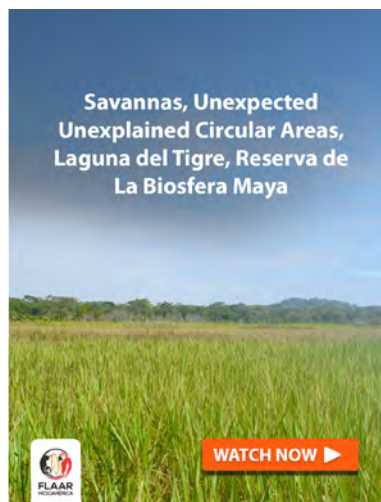
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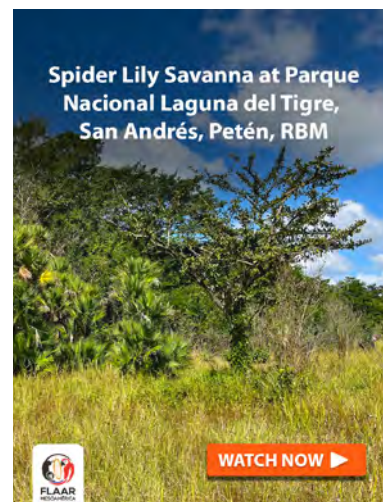
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**Savannas, Unexpected Unexplained Circular Areas, Laguna del Tigre, Reserva de la Biosfera Maya**

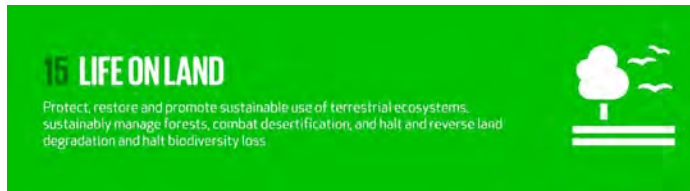
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**Spider Lily Savanna at Parque Nacional Laguna del Tigre, San Andrés, Petén, Reserva de la Biosfera Maya**

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The current Alcalde of Livingston, Mr. Daniel Pinto, together with his team on the Division of International Cooperation, has set the goal of achieving the municipality development in the years 2020-2024 based on the goals and indicators proposed by the 2030 Agenda for Sustainable Development. In this regard, bot FLAAR (USA) and FLAAR Mesoamerica (Guatemala) will collaborate whit this Municipality achieve the Sustainable Development Goal (SDG), number 15 "Life on Land".

Throughout this cooperation project, different materials will be and publishes prepared, as this Photo Essay. These will help to collect information on species, different ecosystems (terrestrial, wetlands and fresh water asociated) and biodiversity. This information will also be useful as it is considered in various conservation estrategies to protect threatened species and prevent their extinction. Moreover, the municipality goals also look forward to promote the sustainable use, conservation and research of the flora and animal species of all terrestrial, wetlands, aquatic shore and coastal associated ecosystems of the Guatemalan Caribbean region. You can learn more about this project and the SDG indicators wich are being pursued at:

<https://flaar-mesoamerica.org/rain-forests-rivers-lakes-bays-ocean-caves-canyons-livingston-the-caribbean-biodiversity-wonderland-of-guatemala/>

**SERIES OF MUNICIPIO OF LIVINGSTON**



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This report may be cited with this information:

HELLMUTH, Nicholas (2022)  
 Anona de Manglar, Alligator or Pond Apple, *Annona glabra*.  
 Municipio de Livingston, Izabal, Guatemala. FLAAR (USA) and  
 FLAAR Mesoamerica (Guatemala). Wetlands series 3: rivers,  
 lagoons, swamps, or ocean, Wetlands #18

**BACK COVER PHOTO**  
***Annona glabra*.**

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Jun. 19,  
 2021, 8:58 a.m. Rio Dulce, Livingston, Izabal.

Camera: Nikon D5. Lens: Nikon AF-Micro-NIKKOR 200mm  
 IF-ED Macro. Settings: 1/320 sec; f/14; ISO 2,000.

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