

WETLANDS #23

# ESPINO DE VACA

## BASTARD BULLY TREE

*Pithecellobium* species



FLAAR  
MESOAMÉRICA

Municipio Livingston,  
Izabal

MARÍA JOSE TORALLA

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AUGUST 2022



## **CREDITS**

The helpful individuals listed below are part of the FLAAR Mesoamérica research and field work team. The office research team is conformed by additional individuals in the main office in Guatemala City.

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The biologist and former curator of the UVAL herbarium from Universidad del Valle, María Renée Álvarez, for her helpful support on the identification of the species described in this report, as well as other species that we have documented in other occasions.

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### **FRONT COVER PHOTOGRAPH**

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, July 4, 2021, 10:36 am, Palo de San Pedro, Aldea Buena Vista, Livingston

Camera: iPhone 13 Pro Max.

### **TITLE PAGE PHOTOGRAPH**

Photo by: Nicholas Hellmuth, FLAAR Mesoamerica, Oct 9, 2021, 10:37 am, Reserva Tapon Creek, Livingston.

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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



## INTRODUCTION TO ***PITHECELLOBIUM SPECIES***

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One of the species that caught our attention on our project of documentation of Livingston's, Izabal, biodiversity was *Pithecellobium lanceolatum*. Standley and Steyermark (1946: 76-77) mention that the pulp that surrounds the seeds of this species is edible. Therefore, if we had the chance to find it in any of the several wetland ecosystems at the municipality of Livingston, we wanted to document it and include it on our series of Edible Plants of the Wetlands.

Later on the execution of the project, and our many expeditions to Livingston, we learned that local people know this tree as espino de vaca and palo de vaca. So we begin to plan our expeditions to look for it. In the beginning, we started finding another *Pithecellobium* species, which is locally known as Palo de San Pedro and corresponds to the species *P. platylobum*. This tree was all along the coastal zone of Livingston. Then, on October of 2021, we finally found the espino de vaca. Lucas Cuz, one of our plant scouts was able to find two plants. One was in the Tapon Creek Nature Reserve, and the other, in the El Rosario area.

When we got back to Guatemala City, and started doing all the pertinent research work we found out that the espino de vaca we were able to photograph might not have been the species we expected. Since we were only able to photograph the stems and leaves, we based our identification on the morphological features of these parts. On doing so, María Renée Álvarez, the curator of the UVAL herbarium from Universidad del Valle, was kind enough to give us helpful support to identify the species.

According to the identification key and the characteristics described by Standley and Steyermark (1946) the plant we photographed could be identified as *P. lanceolatum*. Yet, there's a single feature that apparently is exclusive for *P. furcatum*, which is the petioles being winged. For that reason, and given that there are not many publications available online that mention the distribution of both of these species in Guatemala, we weren't able to get to a conclusion on the identification of this species.

On this report, we include information for the genus *Pithecellobium* as well as for the two possible species of the plant we photographed on 2021. The little information that is included in regards of *P. dulce* is helpful since most of the uses that are described for any *Pithecellobium* species correspond to it. Also, Standley and Steyermark (1946) mention that *P. lanceolatum* fruit might be used as the fruit of *P. dulce*, thus it is useful to include how *P. dulce* is consumed and used.

## GENERAL INFORMATION FOR ***PITHECELLOBIUM* SPECIES**

The genus *Pithecellobium* belongs to the Leguminosae family. The etymology of the name comes from two Greek words: *pithecos* (monkey) and *ellobiom* (ring or ear), perhaps due to the fact that *Pithecellobium* species have twisted legumes which may resemble the shape of a monkey's ear.

Moreover, this genus differs from others because the seed funiculus is modified into a spongy aril. This aril covers a third or half of the seed and in the dehiscence phase, helps suspend the seeds. Also, it can be red, pink or white, and both attractive to birds as edible to humans. *Pithecellobium* is also characterized by the obligate or at least potential presence of lignified stipules (García, 2013).

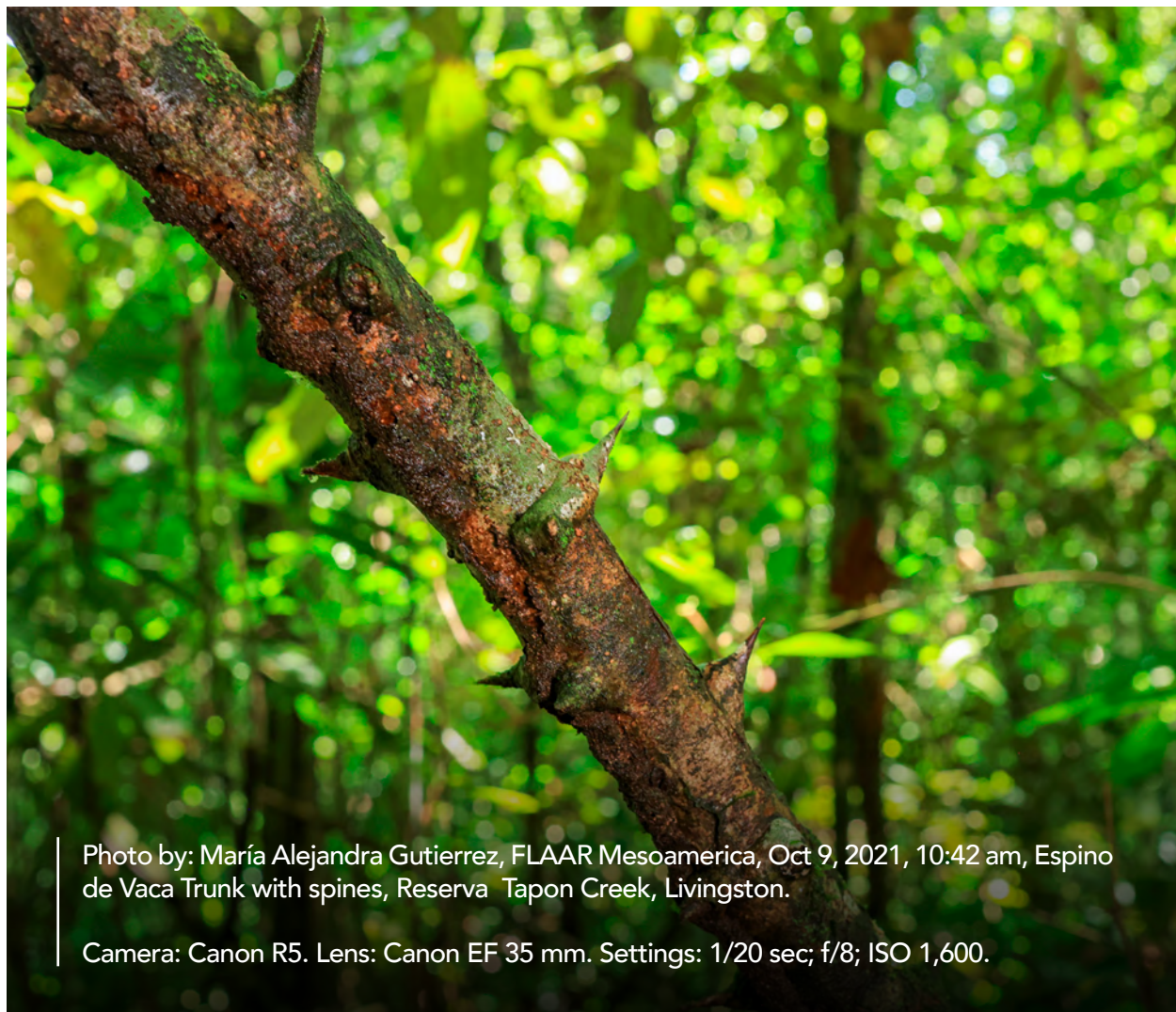


Photo by: María Alejandra Gutierrez, FLAAR Mesoamerica, Oct 9, 2021, 10:42 am, Espino de Vaca Trunk with spines, Reserva Tapon Creek, Livingston.

Camera: Canon R5. Lens: Canon EF 35 mm. Settings: 1/20 sec; f/8; ISO 1,600.



There are 18 species in the genus, which include the medicinal and edible *Pithecellobium dulce*. *P. dulce* is a small to medium sized, evergreen, spiny tree that grows up to 18 m in height. It is native to the Pacific Coast and adjacent highlands of Mexico, Central America and Northern South America (Srinivas et al., 2018).

*P. dulce* might be the *Pithecellobium* species with the greater amount of described and studied uses. Among them, it has been proved to be used as soil improver, soil retainer, as a food source (both the pulp and the seeds are edible), as a melliferous species which yields honey of good quality; for wood posts and carpentry, for forage, as a food source for wildlife, for firewood and charcoal, as a source of glue, a source of essential oils and a source of a yellow dye.

Photo by: David Arrivillaga, FLAAR Mesoamerica, Oct 8, 2021, 12:03 pm, Espino de Vaca, Aldea El Rosario, Livingston.

Camera: Sony A1 (ILCE-1) Lens: Sony FE 30-90mm. Settings: 1/25 sec; f/8; ISO 2,000.





## FULL BOTANICAL NAMES

*Pithecellobium* Mart. is the accepted name for the genus.

The accepted names for the two possible species of the tree we found at Livingston are:

- *Pithecellobium lanceolatum* (Humb. & Bonpl. Ex Willd.) Benth.

- *Pithecellobium furcatum* Benth.

[More information...](#)

Photo by: Victor Castillo, FLAAR Mesoamerica, Oct 8, 2021, 10:42 am, Espino de Vaca, Aldea El Rosario.

Camera: Sony DSC-RX10M4. Lens: Sony FE 600mm. Settings: 1/400 sec; f/8; ISO 1,600.

## HERE ARE SYNONYM **FOR *PITHECELLOBIUM* SPECIES**

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- The genus *Pithecellobium* could also be referred to as:  
*Albizia* sect. *Pithecellobium* (Mart.) F. Muell.
- It can also be found online as:  
*Spiroloba* Raf.
- The synonyms of the two possible species of the photographed plant include:

### **For *P. lanceolatum***

- *Feuilleea ligustrina* (Jacq.) Kuntze
- *Inga lanceolata* Blanco
- *Inga lanceolata* Humb. & Bonpl. ex Willd.
- *Inga ligustrina* Willd.
- *Inga macrostachya* (Vahl) Steudel ex DC.
- *Mimosa lanceolata* Jacq.
- *Mimosa lanceolata* (Humb. & Bonpl. ex Willd.) Poir.
- *Mimosa ligustrina* Jacq.
- *Pithecellobium calostachys* Standl.
- *Pithecellobium campechense* Lundell
- *Pithecellobium insigne* Micheli ex Donn. Sm.

- *Pithecellobium ligustrinum* (Jacq.) Klotzsch ex Benth.
- *Pithecellobium macrosiphon* Standl.
- *Pithecellobium macrostachyum* Benth.
- *Pithecellobium pachypus* Pittier
- *Pithecellobium velutinum* Britton & Rose
- *Pithecellobium winzerlingii* Britton & Rose

### **For *P. furcatum***

- *Feuilleea furcata* (Benth.) Kuntze

<https://www.tropicos.org/name/40009723>

<http://www.worldfloraonline.org/taxon/wfo-4000029904#synonyms>



Photo by: David Arrivillaga, FLAAR Mesoamerica, Oct 8, 2021, 12:03 pm, Espino de Vaca, Aldea El Rosario, Livingston.

Camera: Sony A1 (ILCE-1) Lens: Sony FE 30-90mm. Settings: 1/25 sec; f/8; ISO 2,000.

## LOCAL NAMES FOR ***PITHECELLOBIUM SPECIES.***

Some common names for *Pithecellobium* around the world include:

Blackbeads

[Click here to read more](#)

Granadillo, guaiacan or guamúchil

[Click here to read more](#)

Some common names for *P. lanceolatum* are:

“Guachimol; guachimol bat (...) called ‘tucuy’ in Tabasco; ‘siemche’ (Maya), ‘red fowl,’ ‘bastard bully tree,’ and ‘chucum’ (Maya), in British Honduras” (Standley and Steyermark 1946: 76).

Güichigüi, michigüiste and mochigüiste

[Click here to read more](#)

Conchil

[Click here to read more](#)

The local people in Izabal knew the tree we photographed as palo de vaca, espino de vaca and bastard bully tree, so both *P. furcatum* and *P. lanceolatum* could be referred to by this name, particularly if they develop stipules. The names palo de vaca and espino de vaca might be related with the shape of the leaves, which are reminiscent of a cow’s hoof.

Azabache, Concha, Conchi (Sinaloa), Espino blanco, Cutzé (huasteco en San Luis Potosí), Espino de playa, Espino de vaca, Guamuchete, Guamúchil, Guamúchil bronco (Sinaloa), Hogador (San Luis Potosí), Huamuchilillo (Nayarit), Jinicuilillo, Madre de flecha, Mochaquelite (Jalisco), Muchil (Oaxaca), Muchite, Palodehumo (Veracruz), Pechijume, Peleple, Pinzanillo (Michoacán), Timuche, Timuchi (Guerrero y Michoacán), Tucuy (San Luis Potosí y Tabasco) (Rojas-García et al., 2020).

Buche, in Colombia (Martin et al., 1987).

One of the only names that can be found online for *P. furcatum* is muchite

[Click here to read more](#)

The local people in Izabal knew the tree we photographed as palo de vaca, espino de vaca and bastard bully tree, so both *P. furcatum* and *P. lanceolatum* could be referred to by this name, particularly if they develop stipules. The names palo de vaca and espino de vaca might be related with the shape of the leaves, which are reminiscent of a cow’s hoof.

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

*Passiflora ligularis* is known as granadilla, which is reminiscent of the name granadillo.

Guayacan might be a common name for several species, but the species *Guaiacum sanctum* might be one of the most renowned by this name.

Also, more than one species of *Pithecellobium* might be known by the name guamúchil.



Photo by: Victor Castillo, FLAAR Mesoamerica, Oct 8, 2021, 10:42 am, Espino de Vaca, Aldea El Rosario.

Camera: Sony DSC-RX10M4. Lens: Sony FE 600mm. Settings: 1/400 sec; f/8; ISO 1,600.



Photo by: David Arrivillaga, FLAAR Mesoamerica, Oct 8, 2021, 12:03 pm, Espino de Vaca, Aldea El Rosario, Livingston.

Camera: Sony A1 (ILCE-1) Lens: Sony FE 30-90mm. Settings: 1/125 sec; f/8; ISO 2,000.

## MAYAN NAMES FOR ***PITHECELLOBIUM SPECIES.***

Guamuchillo (Rojas-García et al., 2020) and x-ya´ax eek´ (Zamora et al., 2009) are Mayan names for *P. lanceolatum*. There is no information available online on Mayan names for *P. furcatum*.

## **HABITAT**

Most of the *Pithecellobium* species are described by Standley and Steyermark (1946) as shrubs or small trees that don't surpass 10 m in height.

*Pithecellobium lanceolatum* can be described as a small to medium size tree, which can reach 12 m (Standley and Steyermark 1946: 76).

*Pithecellobium furcatum* can develop as a shrub or tree from 3 to 12 m in height (García 2013: 83).



Photo by: María Alejandra Gutiérrez, FLAAR Mesoamerica, Oct 9, 2021, 10:42 am, Espino de Vaca Trunk with spines, Reserva Tapon Creek, Livingston.

Camera: Canon R5. Lens: Canon EF 35 mm. Settings: 1/20 sec; f/8; ISO 1,600.



## HABITAT, IN WHAT ECOSYSTEM(S) CAN YOU FIND NATIVE *PITHECELLOBIUM SPECIES*

Species in the *Pithecellobium* genus live in a range of habitats so divergent such as dry scrublands and mangrove swamps. These habitats include subtropical and tropical deciduous and semi-deciduous forests, thorny scrubs, chaparrals, desert grasslands and other xeromorphic vegetation, as well as coastal scrub and swamp forests, including mangroves (Tamayo-Cen et al., 2022).

Species like *P. dulce* thrive on flat or rolling terrain. They are frequent along the banks of temporary streams, roads, and avenues. They might as well grow in a wide variety of climatic conditions among tropical and subtropical climates, with rainfall from 450 to 1,650mm. Regarding the soils in which they can develop, it is remarkable how adaptable *P. dulce* can be. They can grow in shallow, poor, rocky (basalt), black-rocky, alluvial, sandy, limestone-rocky, deep sandy-yellow, grayish brown, lithosol, and clay black soils, as well as in wastelands of all kinds (CONABIO, 2013).

*P. lanceolatum* grows in tropical and subtropical zones, between 0 and 1,800 meters above sea level. They are trees that also withstand poor soils, as well as floods, and long-lasting droughts (Rojas-García




Photo by: David Arrivillaga, FLAAR Mesoamerica, Oct 8, 2021, 11:59 am, Espino de Vaca, Aldea El Rosario, Livingston.

Camera: Sony A1 (ILCE-1) Lens: Sony FE 30-90mm. Settings: 1/200 sec; f/7.1; ISO 2,000.

et al., 2020). They have also been said to be found in deciduous and semideciduous brush-woodland, surviving disturbance, and in sunny places, especially along streams, in submontane forest, ascending from the coast, where sometimes impinging on mangrove, 300m (...) to 1100 m (Barnesby and Grimes 1997: 29). Standley and Steyermark mention that this species grows in “moist or wet to rather dry thickets or forest, chiefly on plains, 300 meters or less (Standley and Steyermark 1946: 76).

*P. furcatum* has been reported to grow in tall evergreen jungles, in secondary vegetation and in riparian jungles (García 2013: 85).



Photo by: David Arrivillaga, FLAAR Mesoamerica, Oct 8, 2021, 11:59 am, Espino de Vaca, Aldea El Rosario, Livingston.

Camera: Sony A1 (ILCE-1) Lens: Sony FE 30-90mm. Settings: 1/200 sec; f/7.1; ISO 2,000.

## WHAT OTHER TREES OR PLANTS ARE OFTEN FOUND IN THE SAME HABITAT?

According to the Natural Environment and Society Research and Projection Institute from Rafael Landívar University, some of the life zones in which *Pithecellobium* can be found are the following:

- Tropical Humid Pre-Montane Forest
- Tropical Pre-Montane Rainforest
- Tropical Very Humid Pre-Montane Forest

Thus, some of the species that could grow in the same habitat include:

In **Tropical Humid Pre-Montane Forests:**

*Acacia pennatula*, *Achimenes erecta*, *Alseis yucatenensis*, *Ampelocera hottlei*, *Amphitecna macrophylla*, *Aphelandra scabra*, *Aspidosperma megalocarpon*, *Astronium graveolens*, *Attalea cohune*, *Bauhinia divaricata*, *Bernoullia flammea*, *Bursera bipinnata*, *Bursera diversifolia*, *Bursera graveolens*, *Bursera simaruba*, *Byrsonima crassifolia*, *Calolphyllum brasiliense*, *Castilla elastica*, *Cedrela odorata*, *Ceiba aesculifolia*, *Cephalocereus maxoni*, *Clethra occidentalis*, *Clusia massoniana*, *Coccoloba acapulcensis*, *Cochlospermum vitifolium*, *Cordia urassavica*, *Croton ciliatoglandulosus*, *Croton glabellus*, *Croton payaquensis*, *Crysophila stauracantha*,

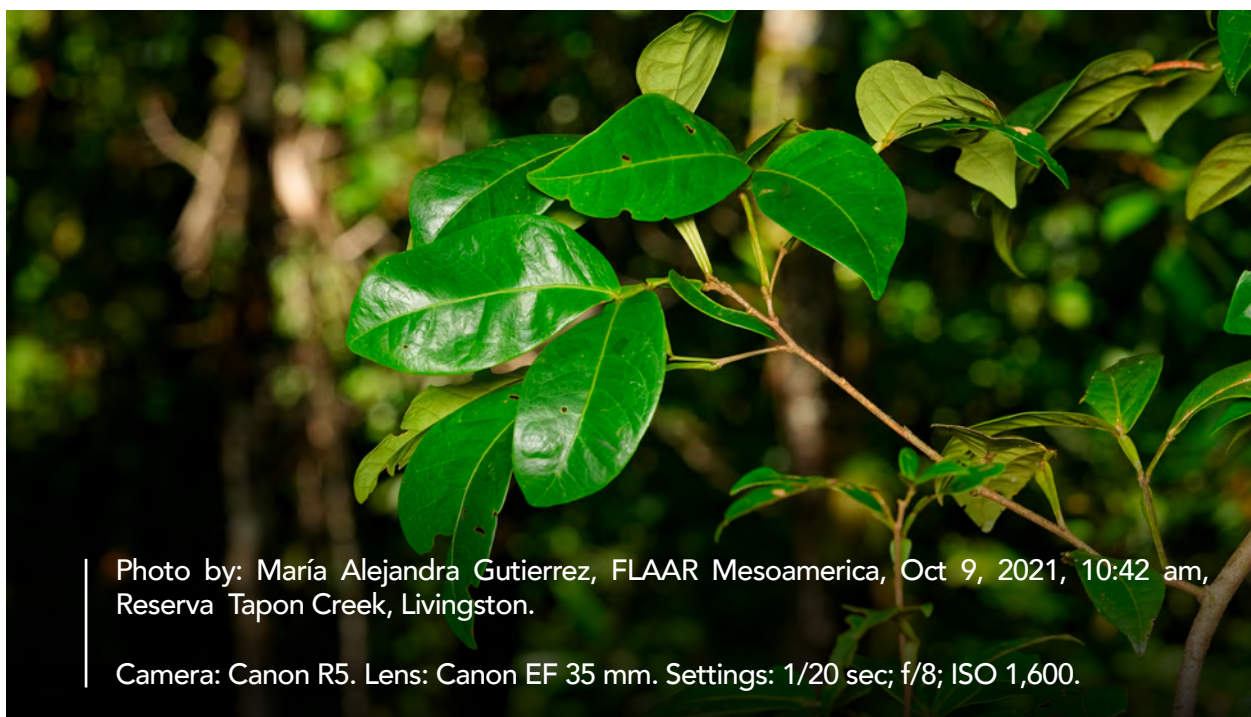


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Camera: Canon R5. Lens: Canon EF 35 mm. Settings: 1/20 sec; f/8; ISO 1,600.

*Curatella americana*, *Cymbopetalum mayarum*, *Dendropanax arboreus*, *Desmoncus orthacanthos*, *Dialium guianensis*, *Drypetes brownii*, *Eritrina berteriana*, *Fraxinus vellerea*, *Gliricidia sepium*, *Guazuma ulmifolia*, *Haematoxylon brasiletto*, *Helicteres guazumifolia*, *Ipomea murucoides*, *Lonchocarpus castilloi*, *Lonchocarpus guatemalensis*, *Louteridium donnell-smithii*, *Malmea depressa*, *Manilkara zapota*, *Metopium brownei*, *Mimosa skinneri*, *Ocimum micranthum*, *Opuntia decumbrens*, *Oreopanax obtusifolius*, *Pachyrrizus erosus*, *Pimenta dioica*, *Pinus caribaea*, *Pinus oocarpa*, *Piper psilorrhachis*, *Plumeria rubra*, *Pouteria campechiana*, *Pouteria reticulata*, *Protium copal*, *Pseudobombax ellipticum*, *Sabal mauritiiformis*, *Sageretia elegans*, *Sapindus saponaria*, *Schizolobium parahybum*, *Sebastiania tuerckheimiana*, *Senecio deppeanus*, *Talisia olivaeformis*, *Tecoma stans*, *Terminalia amazonia*, *Thevetia ovata*, *Tonduzia longifolia*, *Tonduzia pittieri*, *Trichilia minutiflora*, *Turnera ulmifolia*, *Vismia camparaguey*, *Vitex gaumeri*, and *Zanthoxylum culantrillo*. Also the genera: *Acalypha*, *Agarista*, *Agave*, *Brosimum*, *Calliandra*, *Cassia*, *Eupatorium*, *Ficus*, *Guarea*, *Lippia*, *Lysiloma*, *Mammillaria*, *Pasiflora*, *Psidium*, *Quercus*, *Randia*, *Rhus*, *Selaginella*, *Serjania* and *Xylosma* (INAB, 2001, as cited in IARNA-URL [Instituto de Investigación y Proyección sobre Ambiente Natural y Sociedad de la Universidad Rafael Landívar], 2018).

In **Tropical Pre-Montane Rainforests**: *Amphitecna macrophylla*, *Buddleia skutchii*, *Cedrela pacayana*, *Chaetopelea mexicana*, *Citharexylum donnell-smithii*, *Colpothrinax cookii*, *Ehretia luxiana*, *Euterpe precatoria*, *Gunnera killipiana*, *Hedyosmum mexicanum*, *Heliocarpus donnell-smithii*, *Oreopanax xalapensis*, *Parathesis tartaria*, *Podocarpus guatemalensis*, *Pourouma bicolor*, *Psychotria elata*, *Quercus corrugata*, *Quercus purulhana*, *Quercus skinneri*, *Rondaletia cordata*, *Schizolobium parahybum*, *Synechantus fibrosus*, *Tonduzia longifolia*, *Trema micrantha* and *Vismia camparaguey*. Also the genera: *Alnus*, *Clethra*, *Clusia*, *Magnolia*, *Ostrya*, and *Saurauia* (INAB, 2001, as cited in IARNA-URL, 2018).

Lastly, in **Tropical Very Humid Pre-Montane Forests**: *Agarista mexicana*, *Agave oppascidens*, *Amphitecna macrophylla*, *Arbutus xalapensis*, *Brahea dulcis*, *Byrsinoma crassifolia*, *Cedrela pacayana*, *Chaetopelea mexicana*, *Citharexylum donnell-smithii*, *Colpothrinax cookii*, *Comocladia guatemalensis*, *Desmodium angustifolium*, *Dyphisa floribunda*, *Euterpe precatoria*, *Heliocarpus donnell-smithii*, *Inga leptaloba*, *Juniperus comitana*, *Liquidambar styraciflua*, *Myrica cerifera*, *Pachyrrizus erosus*, *Pinus caribaea*, *Pinus maximinoi*, *Pinus oocarpa*, *Pinus tecunumanii*, *Podocarpus guatemalensis*, *Pourouma bicolor*, *Psychotria elata*, *Quercus corrugata*, *Quercus peduncularis*, *Quercus purulhana*, *Quercus sapotifolia*, *Quercus skinneri*, *Quercus tristis*, *Rhus vestita*, *Rondaletia cordata*, *Schizolobium parahybum*, *Senecio deppeanus*, *Stillingia sanguinolenta*, *Synechantus fibrosus*, *Tonduzia longifolia*, *Trema micrantha* y *Vismia camparaguey*. As well as the genera: *Clethra*, *Clusia*, *Magnolia*, and *Saurauia* (INAB, 2001, as cited in IARNA-URL, 2018).

## BOTANICAL DESCRIPTION OF *PITHECELLOBIUM* IN FLORA OF GUATEMALA, STANDLEY AND STEYERMARK (1946)

Standley and Steyermark include the following description for the genus in *Flora of Guatemala* (vol. 24, part V):

Shrubs or trees, unarmed or with spinescent stipules or axillary spines; leaves bipinnate, the leaflets small and numerous or large and few; petioles and leaf rachis usually glandular; stipules usually small and inconspicuous, sometimes spinescent; flowers 5-parted, in globose heads or elongate spikes, mostly white or pink, the peduncles solitary or fasciculate, supra-axillary, axillary, or terminal, sometimes racemose; calyx campanulate or tubular, shallowly dentate; corolla tubular or funnelform, the petals connate to the middle or higher, valvate; stamens numerous, long-exserted, connate at the base or often much higher to form a tube, the anthers small; ovary sessile or stipitate, usually many-ovulate, the style filiform, the stigma terminal, small or capitate; legume exceedingly variable in form, compressed or flat, straight or falcate or often much contorted, sometimes terete, coriaceous or subcarnose, 2-valvate or indehiscent; seeds often imbedded in pulp, ovate or orbicular, commonly compressed, the funicle filiform or often expanded as an aril.

Standley and Steyermark (1946: 67).

*P. lanceolatum* is also described by them as follows:

A small or medium-sized tree, sometimes 12 meters high, the branchlets glabrous or nearly so, the bark smooth or rimose; stipular spines 2 cm. long or shorter; petiole bearing a discoid apical gland, the pinnae 1 pair; leaflets 1 pair, coriaceous or rather thin, pale, glabrous or nearly so, mostly oblong to ovate or obovate and very oblique, 2-7 cm. long, acute or obtuse; flowers whitish, spicate, the spikes dense, 4-12 cm. long, on puberulent peduncles 1-5 cm. long, often forming terminal panicles; bractlets minute, deltoid; flowers puberulent, the calyx 2-3 mm. long; corolla 5-6 mm. long; stamen sheath little if at all exserted; ovary sessile or short-stipitate; legume subterete, almost straight or curved, glabrous, 8-12 cm. long, 1 cm. broad; seeds black, surrounded by a juicy aril.

Standley and Steyermark (1946: 76-77).

*P. furcatum* is not included in Flora of Guatemala, but is rather minutely described by Barneby and Grimes (1997):

Macrophyllidious trees and arborescent shrubs 3-12 m with trunk to  $\pm 1$  dm dbh, randomly armed at nodes with stout, widely ascending, straight tapering stipular spines, appearing glabrous to the gray-silky corollas but the young branchlets and units of inflorescence somewhat thinly minutely pallid-puberulent, the ample, truly glabrous, dull olivaceous lfts subconcolorous, the short, often capituliform spikes of white vespertine fls either axillary to coeval lvs or forming a short efoliate pseudoraceme. Stipules at armed nodes 4-12 mm, at base dilated and recurrent, those at unarmed nodes stiffly subulate-acicular  $\pm 0.5$ -2 mm, all persistent. Lf-formula i/l, each lf 4-foliolate; lf-stks 0.6-5.5 cm, usually broadly marginate, the herbaceous wings wider upward and to 10 mm distally, but the wings occasionally lacking or almost so; a sessile copular nectary  $\pm 0.6$ -1 mm diam at tip of lf-stk and at tip of each pinna; pinna-rachises 6-15 mm, like the lf-stk marginate or not; lfts elliptic or obovate-elliptic from inequilateral, either cuneate or shallowly semicordate base, shortly bluntly acuminate, the larger ones 3.5-9.5 x 1.5-3.5 cm, 2.3-3.3 times as long as wide; venation pinnate, the subcentric midrib gently incurved, giving rise to  $\pm 7$ -10 pairs of major and indefinite intercalary secondary nerves brochididrome shortly within the plane margin, and these in turn to an open reticulum of veinlets, the whole venation finely prominulous on both faces or subimmersed on upper one. Peduncles solitary 0.4-3 cm; spikes  $\pm 14$ -35-fl'd, the axis 4-12 mm, the homomorphic fls ascending, the perianth 5-merous, the calyx firm brown striate, thinly strigulose, the corolla externally silky with appressed gray hairs; bracts ovate- or deltate-acuminate 0.7-1.5 mm, persistent; calyx cylindric or cylindro-campanulate 4.5-7.5 x  $\pm 2$  mm, the often unequal, ovate apiculate teeth 0.6-1.5 mm; corolla narrowly trumpet-shaped 8-12 mm, the ascending ovate lobes 1.7-2.5 x 1.2-2 mm; androecium 36-62-merous, 31-46 mm, the stemonozone 1.6-2.2 mm, the slender tube 11-30 mm; disc 0; ovary minutely stipitate, the ellipsoid body densely puberulent; style shortly exerted from stamens, the stigma poriform. Pods (few seen) sessile, in profile oblong, gently recurved,  $\pm 5$  x 2 cm, laterally compressed but plump, the fuscous-castaneous woody valves becoming finely rugulose, early glabrescent; dehiscence follicular, through the ventral sutures; funicle tapelike, dilated into a scalloped aril nearly half as long as seed, this not seen fully mature.

(Barneby and Grimes 1997: 34).



You can note that from these two species, only *P. furcatum* is described to have winged rachises. In fact, it is noted by Barnesby and Grimes (1997) that this feature is unique for this species in this genus.

## CLOSE RELATIVE(S) OF *PITHECELLOBIUM* SPECIES

Barneby and Grimes (1997) determined through phylogenetics that *P. lanceolatum* and *P. furcatum* are close relatives, and that *P. furcatum* evolved, more recently, from a near and common ancestor with *P. lanceolatum*.

The closest genera that have been defined through phylogenetics are:

- *Havardia* Small
- *Ebenopsis* Britton & Rose
- *Painteria* Britton & Rose
- *Sphinga* Barneby & J. W. Grimes (Tamayo-Cen et al. 2022).

Photo by: María Alejandra Gutiérrez, FLAAR Mesoamerica, Oct 9, 2021, 10:42 am, Espino de Vaca Trunk with spines, Reserva Tapon Creek, Livingston.

Camera: Canon R5. Lens: Canon EF 35 mm. Settings: 1/20 sec; f/8; ISO 1,600.



## *PITHECELLOBIUM*

# **SPECIES IN BELIZE**

The species *Pithecellobium hondurensense* and *P. winzerlingii* Britton & Rose have been recorded in Belize (García, 2013), as well as *Pithecellobium lanc* (most probably *P. lanceolatum*)

[Click here to read more](#)

According to Barneby and Grimes (1997), *P. johansenii* is local along or near the coast of Belize. Also *P. peckii* and *P. bipinnatum* are local in south Belize. *P. furcatum* has been localized in Toledo.

Photo by: María Alejandra Gutiérrez, FLAAR Mesoamerica, Oct 9, 2021, 10:42 am, Espino de Vaca Trunk with spines, Reserva Tapon Creek , Livingston.

Camera: Canon R5. Lens: Canon EF 35 mm. Settings: 1/20 sec; f/8; ISO 1,600.



## WHERE IN MEXICO CAN **PITHECELLOBIUM SPECIES BE FOUND?**

*Pithecellobium* has a wide distribution in the tropical zones of the country. In the Gulf: Tamaulipas, San Luis Potosí, Hidalgo, Querétaro, northern Veracruz, and the driest part of the Yucatan Peninsula; in the Pacific: from Baja California and Sonora, up to Chiapas, including Cuenca del Balsas (CONABIO, 2013).

*P. dulce* is native to Mexico. It is distributed in warm climates throughout the country, on the gulf side it is found in Tamaulipas, San Luis Potosí, Hidalgo, Querétaro, and northern Veracruz, in addition to the driest part of the Yucatan Peninsula. On the Pacific slope it is distributed from Baja California and Sonora to Chiapas (CONAFOR, 2013).

Moreover, *P. lanceolatum* has a wide distribution in northern Mexico. It can be found on the slopes of the Pacific from Sinaloa to Chiapas and in central Veracruz. It may be present in Jalisco, Tlaxcala, and Michoacán. Also, it can be found in the states of Morelos, Puebla, Guerrero, Oaxaca and Chiapas (Sánchez-Casas and Alvarez, 2000).

*P. furcatum* has been found in SE Mexico, particularly in the South of Veracruz, the East of Oaxaca, Tabasco, and the North of Chiapas.

## WHERE HAVE *PITHECELLOBIUM* SPECIES BEEN FOUND IN THE MUNICIPIO OF LIVINGSTON?

A study by Pérez et al. (2018), mentions the presence of *Pithecellobium* in different areas of Guatemala: Aguacatan, Huehuetenango; Los Balsamos, San Agustín Acasaguastlán, El Progreso; and Tres Ranchos, Barillas, Huehuetenango. Although the study mentions two important areas of Livingston: Laguna Grande and Lagunita Creek, Pérez et al. didn't report this genus in either of them.

- Are *Pithecellobium* species listed for Biotopo Protegido Chocón Machacas, CECON/USAC?  
No information found online.
- Are *Pithecellobium* species listed for Tapón Creek Nature Reserve FUNDAECO?  
No information found online, but the specimen we found was in the trail of the Reserve.
- Are *Pithecellobium* species listed for Aldea Buena Vista near to Tapón Creek Nature Reserve (including Taponcito Creek)?  
No information found online.
- Are *Pithecellobium* species listed for Cerro San Gil (south side of Río Dulce)?  
Yes, according to Cardona (2008), the genus *Pithecellobium* (no particular species), and the species *P. arboreum*, are registered for the Aldea Nueva Río Frío located within the RPM Cerro San Gil.
- Are *Pithecellobium* species listed for El Refugio de Vida Silvestre Punta de Manabique?  
No information found online.
- Are *Pithecellobium* species listed for Ecoalbergue Lagunita Creek (Área de Usos Múltiples Río Sarstún)?  
Yes. *Pithecellobium dulce* is part of the list of plants found on the banks of the Sarstún River according to a research study carried out by Oliva (2012) in the Área de Usos Múltiples Río Sarstún.
- Are *Pithecellobium* species listed for Sarstoon-Temash National Park (northern side of Río Sarstún)?  
Yes. According to Meerman et al. (2003), the genus *Pithecellobium* is present in the flora list of the Sarstoon Temash National Park and surroundings.
- Are *Pithecellobium* species listed for Bocas de Polochic?  
Only *Pithecellobium vulcanicum* has been recorded in the Polochic River basin as well as in Sierra de las Minas (USAID, 2019).



- Are *Pithecellobium* species trees registered for Parque Nacional Tikal?

Yes. According to the National Herbarium of the United States, <https://biodiversidad.gt> there is a specimen of *Pithecellobium lanceolatum* that was collected inside the park.

The species *P. dulce* has also been recorded in the Maya Biosphere Reserve, although not specifically in Parque Nacional Tikal (CONAP, 2015).

Reyes (2009) reported *P. lanceolatum* in Parque Nacional Tikal and other areas of Petén.

- Are *Pithecellobium* species trees registered for Parque Nacional Yaxhá, Nakum and Naranjo?

According to the Missouri Botanical Garden <https://biodiversidad.gt> and the New York Botanical Garden Steere Herbarium <https://biodiversidad.gt> specimens of *Pithecellobium lanceolatum* have been collected in Parque Nacional Yaxhá, Nakum and Naranjo.

Photo by: David Arrivillaga, FLAAR Mesoamerica, Oct 8, 2021, 11:59 am, Espino de Vaca, Aldea El Rosario, Livingston.

Camera: Sony A1 (ILCE-1) Lens: Sony FE 30-90mm. Settings: 1/200 sec; f/7.1; ISO 2,000.

## ARE *PITHECELLOBIUM* SPECIES FROM THE HIGHLANDS OR FROM THE LOWLANDS (OR BOTH)?

In general terms, *Pithecellobium* is from the lowlands of Belize, Guatemala, Honduras, and Mexico (Hartshorn, 2000).

It can be said that *P. dulce* is mostly from the lowlands, yet there is herbarium data from specimens that have been collected near and above 1000 m above sea level (GBIF.org). The same happens with *P. lanceolatum* (Barneby and Grimes, 1997).

*P. furcatum*, on the other hand, is apparently exclusive of the lowlands (Barneby and Grimes, 1997).



Photo by: Victor Castillo, FLAAR Mesoamerica, Oct 8, 2021, 10:42 am, Espino de Vaca, Aldea El Rosario.

Camera: Sony DSC-RX10M4. Lens: Sony FE 600mm. Settings: 1/400 sec; f/8; ISO 1,600.

## WORLD RANGE **FOR *PITHECELLOBIUM* SPECIES**

This genus is native to Latin America. Its distribution range covers Mexico, Guatemala, and the rest of Central America, as well as the northern part of South America including Colombia, Ecuador, Venezuela, Brazil, and Peru. It is also distributed in the islands of Cuba, Jamaica, Haiti, and the Dominican Republic. It has been introduced to many countries as well, such as southern United States, Guyana, Suriname, Nigeria, Egypt, India, and many more.

[Click here to read more](#)

*P. lanceolatum* is native to Belize, Colombia, Costa Rica, El Salvador, Guatemala, Honduras, Mexico Gulf, Mexico Northeast, Mexico Southeast, Mexico Southwest, Nicaragua, Panamá, Southwest Caribbean, Venezuela, and Venezuelan Antilles. It has not yet been introduced to another country.

[Click here to read more](#)

*P. furcatum* ranges from the South of Mexico to Costa Rica (Tropicos.org Missouri Botanical Garden).





Photo by: David Arrivillaga, FLAAR Mesoamerica, Oct 8, 2021, 11:59 am, Espino de Vaca, Aldea El Rosario, Livingston.

Camera: Sony A1 (ILCE-1) Lens: Sony FE 30-90mm. Settings: 1/200 sec; f/7.1; ISO 2,000.

## DOES *PITHECELLOBIUM* SPECIES ALSO GROW IN HOME GARDENS?

Yes. The species *Pithecellobium dulce* can be used in home gardens and it has a cultural value and multiple uses (Sotelo, 2016). Also, there is a study that shows the floristic composition of home gardens of Tilzapotla, Mexico and one of the species used is *P. dulce* (Ortiz-Sánchez et al., 2015). This species is also planted as an ornamental in streets, avenues, parks, and gardens (Ortiz, 2014).

It is probable that *P. lanceolatum* and *P. furcatum* are not cultivated.

## USES FOR *PITHECELLOBIUM* SPECIES.

As the photographed species has not yet been identified, here we mention some uses of different species of the genus.

*Pithecellobium dulce* is the most used plant of this genus. This species uses include production of wood, fruits, forage, medicinal substances, rubber, and shade. It also helps to control erosion, improve water filtration through the root system, fix atmospheric nitrogen and serve as windbreaks and maintain fertility (Monroy and Colin, 2004). It also has an edible aril and is a melliferous species (Avedaño and Acosta, 2000). Its fruit has been reported to be consumed in different parts of Mexico and Colombia (Segura et al., 2018; López and García, 2021). The seeds of *P. dulce* contain 10% fat that can be used in the production of soap. Its ground seeds can serve as a protein-rich concentrate; the flowers and fruits constitute

good forage since they contain between 23 to 29% of crude protein and between 17 to 19% of fibers. The gum that emanates from the trunk diluted in water is used as mucilage. It is also used as an ornamental tree. It is considered an important source for the production of oils and essences, latex, resin, gums, tannins, as well as other products of cosmetic and medicinal use (CONAFOR, 2013).

The species *P. lanceolatum* has several important uses such as the following. Its seed aril is edible (Avedaño and Acosta, 2000) and the fruits have been reported to be eaten in different parts of Mexico and Colombia (Segura et al., 2018; López and García, 2021). It is considered a timber species, the stem is used for construction and even its branches and leaves are considered to have magical-religious uses (Zamora et al., 2009).



## IS THERE POTENTIAL MEDICINAL OF *PITHECELLOBIUM* SPECIES BY LOCAL PEOPLE?

Yes. *Pithecellobium dulce* has ethnomedicinal uses since the chemical composition of the species has basic biological active compounds. The leaves, bark, fruits, seeds, and roots are known to have therapeutic functions and they have been used by traditional practitioners (Srinivas et al., 2018). Its therapeutic and biological values can be seen in the estrogenic activity in the root extracts, the anti-inflammatory activity of the fruits and various parts have been reported to be as a remedy for earache, leprosy, toothache, and venereal diseases. This plant is also used as a remedy for dermatitis eye inflammation (Murugesan et al., 2019).

Other species in the genus, such as *P. clypearia* and *P. jiringa* also have interesting medicinal uses. For instance, *P. clypearia* has been used to treat respiratory diseases (Li et al., 2006) and *P. jiringa*, to treat diabetes mellitus (Maxiselly et al. 2017). In that sense, it could be helpful to explore the medicinal properties of unstudied species such as *P. lanceolatum* and *P. furcatum*.

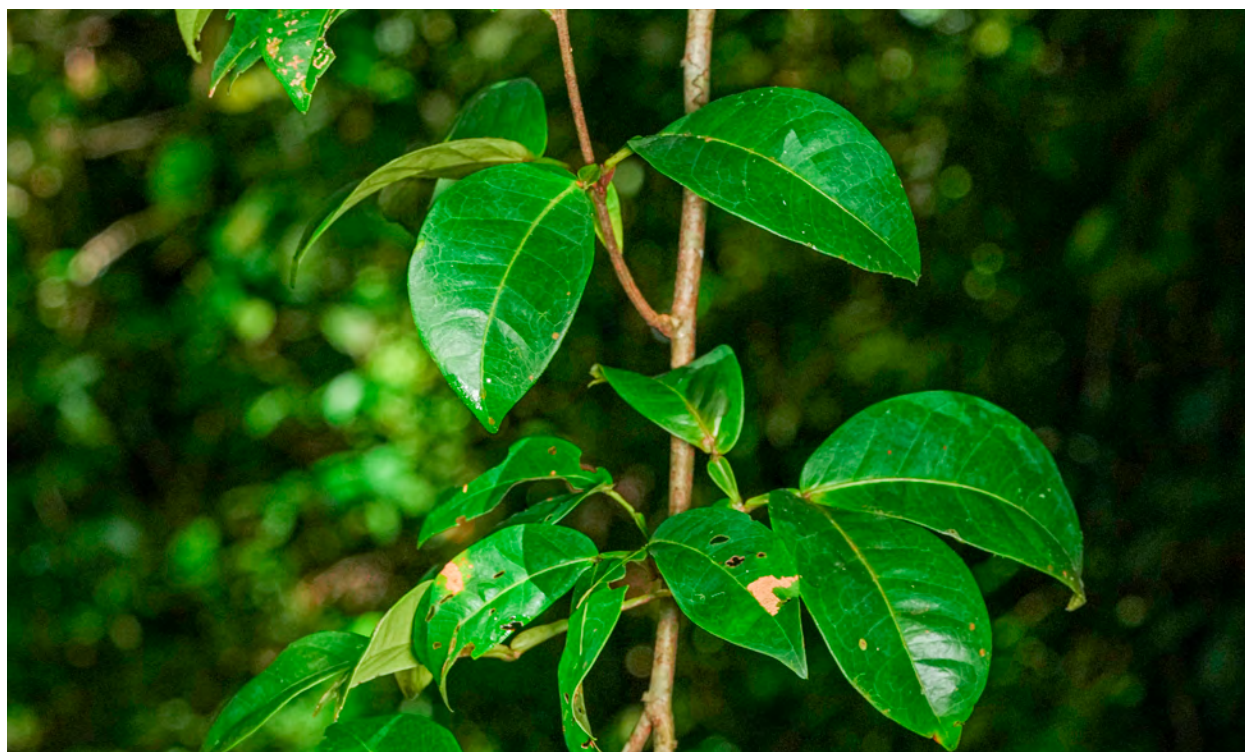


Photo by: David Arrivillaga, FLAAR Mesoamerica, Oct 8, 2021, 11:59 am, Espino de Vaca, Aldea El Rosario, Livingston.

Camera: Sony A1 (ILCE-1) Lens: Sony FE 30-90mm. Settings: 1/200 sec; f/7.1; ISO 2,000.

## ARE ANY PARTS OF **PITHECELLOBIUM** **SPECIES EATEN BY** **MAMMALS?**

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Yes. *Pithecellobium lanceolatum* leaves are used as fodder, and the fruit has been reported to be eaten by livestock and wildlife (Rojas-García et al., 2020).

A study by Pozo-Montuy and Serio-Silva (2006) mentions that, among other plants from the ground, monkeys (*Alouatta pigra*) mainly eat *P. lanceolatum*. Bats have also been documented to include *P. lanceolatum* as part of their diet, specifically its pollen. The species that do so are part of the genus *Glossophaga* (Sánchez-Casas and Alvarez, 2000).

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Camera: Sony A1 (ILCE-1) Lens: Sony FE 30-90mm. Settings: 1/200 sec; f/7.1; ISO 2,000.





Photo by: David Arrivillaga, FLAAR Mesoamerica, Oct 8, 2021, 11:59 am, Espino de Vaca, Aldea El Rosario, Livingston.

Camera: Sony A1 (ILCE-1) Lens: Sony FE 30-90mm. Settings: 1/200 sec; f/7.1; ISO 2,000.

## WHAT ARE THE PRIMARY POLLINATORS OF *PITHECELLOBIUM* SPECIES FLOWERS?

*P. lanceolatum* is described as a nectariferous-polleniferous species, and it is an important alternative food source visited by bees during food crises to obtain both nectar and pollen (Villalpando-Aguilar et al., 2022). Also, bats must pollinate *P. lanceolatum* since pollen from this species was identified in the stomach content of

four species in the *Glossophaga* genus (Sánchez-Casas and Alvarez, 2000).

There is little information available online on *P. furcatum*, and no information regarding its pollinators.



Photo by: David Arrivillaga, FLAAR Mesoamerica, Oct 8, 2021, 11:59 am, Espino de Vaca, Aldea El Rosario, Livingston.

Camera: Sony A1 (ILCE-1) Lens: Sony FE 30-90mm. Settings: 1/200 sec; f/7.1; ISO 2,000.

## CONCLUDING DISCUSSION AND **SUMMARY ON *PITHECELLOBIUM* SPECIES**

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It is most notable that *P. dulce* is the species with the most described uses and on the other hand, there is little information on *P. lanceolatum* and *P. furcatum*. Nevertheless, *P. lanceolatum* also has some interesting potential uses.

María Renée Álvarez, biologist and former curator of the UVAL Herbarium (at Universidad del Valle), suggested that the species we photographed was *P. lanceolatum*, nevertheless, the wings in the rachises suggest that it could be *P. furcatum*. For that reason, we encourage other scientists to do more work on this species, and verify through botanical research if the feature of the wings could also be seen in *P. lanceolatum*, and even, if the species we photographed at Reserva Tapon Creek could correspond to a population within another taxonomic group (either a species, subspecies, variety, etc).

Given that we couldn't identify the plant we photographed, we cannot confirm if *P. lanceolatum* can be found in the wetland ecosystems of Livingston, Izabal. The only report of this species in Guatemala was found somewhere within the proximity of the border between Izabal and Alta Verapaz. So finding it remains probable, and if so, *P. lanceolatum* would also be another edible and utilitarian species of the wetlands at Livingston.

Exploring if *P. lanceolatum* and *P. furcatum* also share the same uses of *P. dulce*, such as fixing nitrogen, avoiding erosion, among others, could also be helpful to determine if these species have multiple uses. That would be useful to include these species in conservation projects, in particular, as recommended species for the regeneration of wetland ecosystems.

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## Helpful web sites **for any and all plants**

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). Therefore, we prefer to focus on web sites that have reliable information.

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

Neotropical Flora data base. 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 the collection of the Field Museum herbarium of 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 animals. The videos of the insects are great.

[www.kew.org/science/tropamerica/imagedatabase/index.html](http://www.kew.org/science/tropamerica/imagedatabase/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** is no longer useful,  
instead we can use: <http://www.worldfloraonline.org>

### Web pages specifically on *Pithecellobium* species.

<https://florida.plantatlas.usf.edu/Genus.aspx?id=952>

Identification key and distribution of *Pithecellobium*

[https://www.itis.gov/servlet/SingleRpt/SingleRpt?search\\_topic=TSN&search\\_value=26870#null](https://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=26870#null)

Taxonomy of *Pithecellobium*

<https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:331859-2>

Description, distribution, uses and pictures of the genus

<https://colombia.inaturalist.org/taxa/123476-Pithecellobium>

Information, pictures and description of the genus

<https://panamabiota.org/stri/taxa/index.php?taxon=68399&clid=71>

Information, description, uses and pictures of *P. lanceolatum*

<https://biodiversidad.gt/portal/taxa/index.php?taxon=14263&clid=20>

Pictures of *P. lanceolatum*

<https://www.gbif.org/es/species/2962824>

General information and images on *P. lanceolatum*

<https://enciclovida.mx/especies/171799>

Names, pictures and general information on *P. lanceolatum*

<https://colombia.inaturalist.org/taxa/279314-Pithecellobium-furcatum>

General information, images, taxonomy, distribution, and uses of *P. furcatum*

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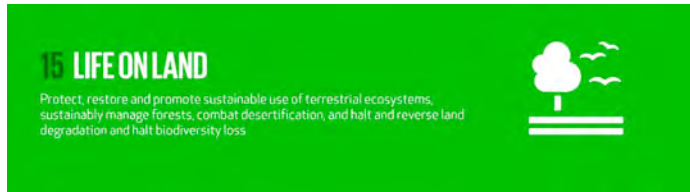
**Niza Franco** is part of our MayanToons Animation team. Her job is to bring our favorite characters to life.

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**Rosa Sequén** is an illustrator for MayanToons



The current Alcalde of Livingston, Mr. Daniel Pinto, together with his team of International Cooperation division, have 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. From this agenda, FLAAR (USA) and FLAAR Mesoamerica (Guatemala) will collaborate to achieve Sustainable Development Goal (SDG), number 15 "Life on Land".

Throughout this cooperation project, different materials have been prepared, like this Photo Essay, that helps to collect information on species, different ecosystems: terrestrial, wetlands and fresh water biodiversity. This information would also be useful as part of a strategy to protect threatened species and prevent their extinction. The municipality's goals include to promote the sustainable use, conservation and research of the species of flora and fauna of the terrestrial, wetlands and aquatic shore and coastal ecosystems of the Guatemalan Caribbean. Learn more about this project and the SDG indicators at:

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

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# 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.
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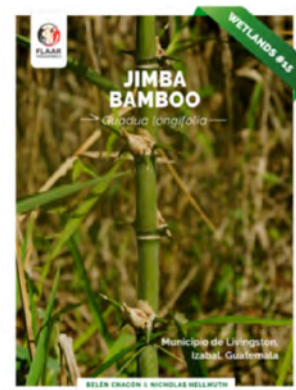
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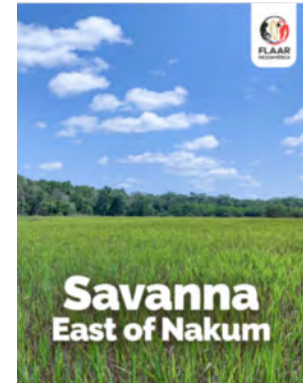
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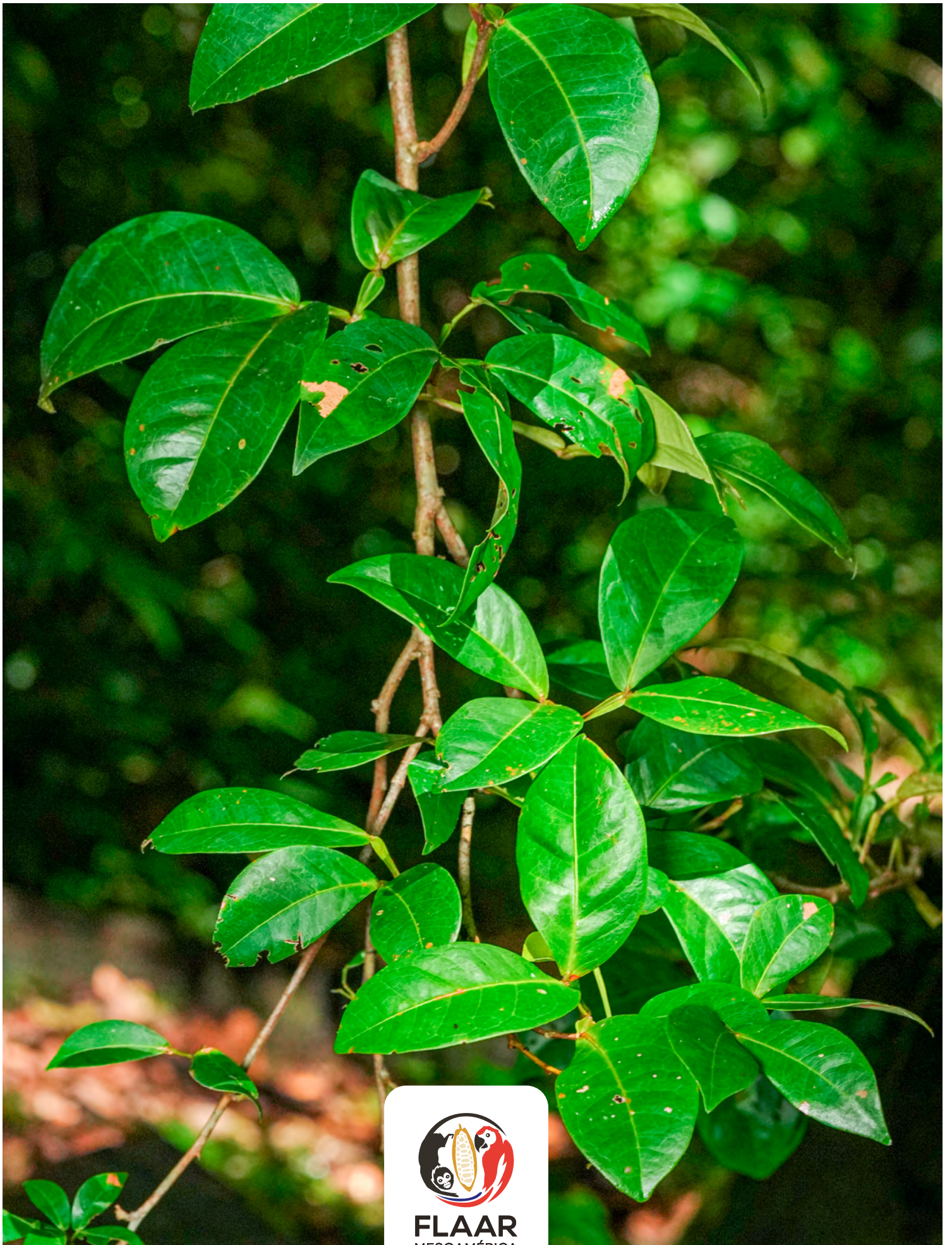


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