

TREES OF LA MILPA

A Field Guide to Trees of La Milpa,
Rio Bravo Conservation and Management Area,
Belize

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Aspidosperma cruentum



Cojoba arborea

“Becoming acquainted with tropical nature is, before all else, a great esthetic experience... The variety of lines and forms in tropical forests surely exceeds what all surrealists together have been able to dream of...”

– Theodosius Dobzhansky. 1950. “Evolution in the Tropics”

“To me the rainforest was still an undifferentiated mass. But to Manoel, Ruby, and Leonça it had dimensions and was imbued with a strong sense of place. Each stream, each slight change of contour, and each big tree were distinctive.”

– Alex Shoumatoff. 1978. *The Rivers Amazon*

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Contents

Introduction	5
How to Use this Guide	5
1 SIMPLE ALTERNATE LEAVES	13
2 SIMPLE ALTERNATE TOOTHED LEAVES	62
3 SIMPLE CLUSTERED LEAVES	75
4 SIMPLE OPPOSITE LEAVES	85
5 COMPOUND-PINNATE ALTERNATE LEAVES	103
6 COMPOUND-PINNATE OPPOSITE LEAVES	135
7 COMPOUND-BIPINNATE LEAVES	138
8 COMPOUND-PALMATE ALTERNATE LEAVES	148
9 COMPOUND-PALMATE OPPOSITE LEAVES	152
10 PALMS	154
Appendix: Environment and Forests of La Milpa	161
Glossary	165
Bibliography	167
Acknowledgments	170
Index	171



Lysiloma latisiliquum, salám

Introduction

This is a guide to field identification of trees in the area of La Milpa ruins and La Milpa Lodge, in the Rio Bravo Conservation and Management Area, northwest Belize (**Appendix**).

We define a tree as a woody, typically single-stemmed, self-supporting plant. Trees range from 2-meter understory treelets to 40-meter canopy emergents. The guide describes 139 tree species, mainly the more common or conspicuous species in upland forest, riparian forest, and transition forest as well as some prominent species in bajo forests. We do not include savanna or cultivated species. A few common shrubs (woody, multi-stemmed, self-supporting plants) are included. See the **Glossary** for definitions of forest types and the **Appendix** for description of the forests at La Milpa.

This guide helps you identify trees using sterile characteristics – tree form, bark, leaves, twigs – not flowers and fruits. We focus on “key features”, distinctive sterile features that distinguish a given tree species from other tree species and which you can see in the field (use binoculars for distant leaves). The guide notes distinctive characteristics of some plant families (for more on families see the **Bibliography**). It is best to read **How to Use this Guide** before proceeding.

We welcome suggestions, corrections, and questions (nvbrokaw@ites.upr.edu).

How to Use this Guide

1. Determine the *leaf arrangement* of the unidentified tree, as described below.
2. Go to the section of the guide for the selected leaf arrangement (Table 1).
3. In the selected leaf arrangement section inspect the photographs and text, especially **Key features**, and find the best match for the unknown tree. Compare with **Similar species** in the species accounts. (In each leaf arrangement section the species descriptions are arranged alphabetically by family, genus within family, and species within genus.)

Table 1 – Guide sections, leaf arrangement	<u>page</u>
1. Simple alternate	13
2. Simple alternate toothed	62
3. Simple clustered	75
4. Simple opposite	85
5. Compound-pinnate alternate	103
6. Compound-pinnate opposite	135
7. Compound-bipinnate	138
8. Compound-palmate alternate	148
9. Compound-palmate opposite	152
10. Palms	154

Leaf arrangement

Tree leaves are arranged in species-characteristic patterns (leaf arrangement) on twigs and branches. In this guide species are grouped according to leaf arrangement as a first step toward identification. (**Simple alternate toothed leaves** and **Palms** are additional groups.) Leaf arrangement is usually obvious but not always. Some species require careful study to determine arrangement. Also, take care that the leaves you are examining belong to the tree in question, that is, are truly attached to it.

Leaves of other trees and lianas (woody vines) may intermix with leaves of the tree in question. The leaf arrangements are:

1. Simple alternate (p 13)

Leaf has one blade. Leaves are arranged alternately on the twig. The spacing between leaves may be regular or irregular. In some species the leaves are anatomically alternate but so tightly clustered that the alternate arrangement is hard to see. These species are covered in Section 3, but if in doubt check this section also.



Ampelocera hottlei P*

2. Simple alternate toothed (p 62)

Leaf has one blade. Leaves are arranged alternately on the twig. Leaf edge (margin) has *teeth* (making a jagged or irregular edge). Note that the teeth may be only near the tip of the blade, or the teeth may be small and hard to see. Several species have minute teeth. Some species in this section also appear in Section 1.



Guazuma ulmifolia P

3. Simple clustered (p 75)

Leaf has one blade. Leaves are strongly clustered at twig ends (species with weakly clustered leaves are not included in this section). The degree of clustering can vary within and among species. Some species appear in this section and in Sections 1 or 4.



Alseis hondurensis

*code for photo credits, p 12

4. Simple opposite (p 85)

Leaf has one blade. Leaves are arranged opposite each other on the twig. Some species have leaves that are not always perfectly opposite but generally are. Some species in this section that have tightly clustered leaves also appear in Section 3.

Pimenta dioica



5. Compound-pinnate alternate (p 103)

Leaf has more than one blade, making a *compound leaf*. The multiple blades of the leaf are *leaflets*. The leaflets are arranged along a *rachis*, forming a *pinnate leaf*. The compound-pinnate leaves are arranged alternately on the twig.

Depending on the species, the leaflets may be opposite or alternate on the rachis. If the leaflets are opposite, a single, un-paired leaflet at the end of the rachis indicates that there is an uneven number of leaflets (leaf is *odd-pinnate*); lack of this terminal leaflet indicates that there is an even number of leaflets (*even-pinnate*). If the leaflets are alternate, whether there is an odd or even number of them is hard to judge and not a good field mark. Individual leaflets may fall off, obscuring leaflet number.

(discussion of **compound-pinnate alternate** continued next page)

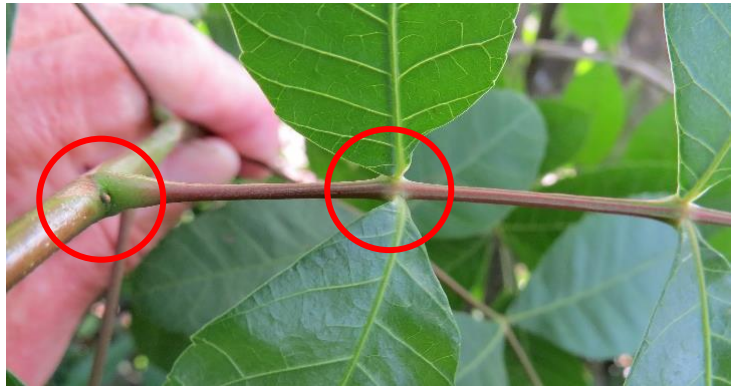


Leaflets opposite, odd-pinnate; *Piscidia piscipula*



Leaflets alternate; *Pterocarpus rohrii*

It is sometimes hard to tell simple from compound leaves. Simple leaves can be small and so evenly arranged on a twig as to make it look like a pinnate leaf. Conversely, leaflets of a compound leaf can be large and appear to be simple leaves. To determine if a blade is a leaf or a leaflet look for a bud in the axil where a stem connects the undetermined blade to twig or leaf rachis. Presence of a bud indicates the *petiole* (stem) of a leaf, with either one blade (simple) or multiple blades (compound). Lack of a bud in the axil indicates the *petiolule* (stem) of a leaflet of a compound leaf. Axillary buds may be tiny and hard to see.



Bud in leaf axil (left) but not in leaflet axil (center) on a pinnate leaf (*Schinus terebinthifolius*, species not in this guide; photo in Puerto Rico).

6. Compound-pinnate opposite (p 135)

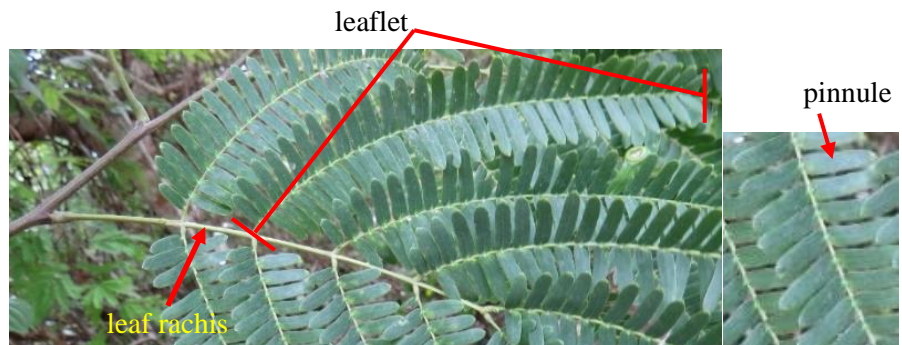
Leaf is compound-pinnate, as in Section 5. However, the compound-pinnate leaves are arranged opposite each other on the twig.



Matayba oppositifolia

7. Compound-bipinnate (p 138)

Leaf has more than one blade, and the leaflets themselves also have more than one blade (*pinnules*). This arrangement forms a *bipinnate* (twice pinnate) leaf.



Lysiloma latisiliquum

8. Compound-palmate alternate
(page 148)

Leaf consists of more than one blade. The leaflets are arranged palmately, that is, radially from the petiole apex. These *compound-palmate leaves* are arranged alternately on the twig. They may be clustered sometimes.

Ceiba pentandra



9. Compound-palmate opposite
(p 152)

Leaf is compound-palmate, as in Section 8. These compound-palmate leaves are arranged opposite each other on the twig.

Vitex gaumeri



10. Palms (p 154)

The tree is a palm.

Attalea cohune P



Text and photographs for the species accounts



Words and abbreviations are defined in the **Glossary**. Where information on a species is lacking at present, we note this as “(ni)”, meaning “no information”. Swung dash (~) means “almost”, “approximately”, “roughly”.

Tree name

1) Scientific name (genus, species) followed by abbreviations indicating the author(s). The author is the person who technically described and classified the species. If tree name is revised, the earlier author name is in parentheses. See Mabberly (2017) for full author names. When genus only is named, no author is given; 2) common name(s) of the species likely to be used in the La Milpa area; 3) plant family of the species. Species names are from *Tropicos*[®] (p 169).

Photographs and drawings

Photographs and drawings. For each species these are arranged clockwise from upper left, usually in the sequence: trunk and bark, branches and twigs and leaves, flowers, and fruits, when available.

Circles  and arrows  on the photos enclose or indicate some key features.

Key features

Sterile characteristics that distinguish the species; habitat of the species, if distinctive. In the species account leaf arrangement is usually implicit, according to guide section (Table 1). Designations *small*, *medium*, *large*, and *very large* refer to adult tree size (see **Form** below). *Edges* indicates a species found on forest edges or in other open areas.

Form

Typical mature size of the tree species and other features, such as trunk characteristics. *Small* species reach 2-8 meters (m) in height, *medium* reach 15 m, *large* reach more than 15 m, and a few *very large* grow to 30+ m, with proportionately thick trunk. Trunk characteristics, such as channeling, develop with tree age and size.

Bark

Typical species-specific bark and sap characteristics. Bark varies among individual trees of a species, but typical bark can be described. The main bark descriptors are: *ridged* (with vertical, parallel, crested surfaces, crevices between), *fissured* (with vertical, parallel, shallow grooves in otherwise smooth bark), *scaly* (with peeling surface; can occur with other bark types), and *smooth* (lacking scales, ridges, etc.). Other, self-explanatory terms are used. *Smooth* is a relative term, no bark being perfectly smooth. Distinctive *lenticels* (small protuberances) may be evident on smooth bark. Bark changes with age and size. Juvenile trees and small branches have smooth bark compared to bark on older trees and the main trunk. Fissured bark may become ridged. Changes with age and size are noted in the text as “becoming” or “developing”. Bark color may appear varied due to lichens on bark surfaces. Some bark photos include a 10-centimeter rule. Despite presence of a bark photo, “(ni)” is sometimes used to indicate not enough information for confident description. Presence and color of sap may be distinctive. Check sap by breaking off a leaf or twig, not by slashing the trunk. “Stem” is used variously for trunk, branch, or twig.

Leaf

Distinctive features of leaves and twigs. Leaf arrangement is usually implicit, according to guide section. Shape is often not described if it is shown clearly in photos. Leaves on trees growing in the open or at the tops of tree crowns may be smaller and thicker, or held more upright, than leaves on trees inside the forest or leaves lower on the tree. Leaves on juvenile trees may differ from leaves on adult trees. New leaves are usually lighter-colored than old leaves and sometimes reddish. Some photos in this guide show distinctive upper-canopy leaf arrays that can be recognized at a distance.

Flower

Brief description of flowers. For some species a photo on the page suffices, indicated by “(photo)”. Some descriptions were adapted from Parker (2008).

Fruit

Brief description of fruit and seed. For some species a photo on the page suffices for description.

Ecology

Forest type where the species is typically found, various notes, abundance class. Forest types include *upland*, *riparian*, *transition*, and *bajo* (**Glossary, Appendix**). Many tree species occur in multiple forest types. Some species occur in particular habitats within a forest type, for example: in treefall gaps, or in *dry upland forest* (upper slopes and hill tops) versus *moist upland forest* (typically on lower slopes). Individuals of a species can occur by chance in untypical sites. There is also *secondary forest*, which has grown up on roadside forest edges or in former open areas in the last 100 or so years. Species associated with secondary forest (*pioneers*) tend to have widely-dispersed seeds, require high light for survival, and grow fast. Other tree species exhibit opposite or other life history characteristics that we either do not have the space here, or the knowledge of, to describe.

Abundance class is based on the likelihood of encountering the species in its typical forest type:

Ab = Abundant: there is likely to be a tree of this species within about 30 m of a point where an observer is standing in the appropriate forest type.

Co = Common: there is likely to be a tree of this species within about 50 m of an observer standing in the appropriate forest type.

Oc = Occasional: there is likely to be a tree of this species within 200 m of an observer standing in the appropriate forest type.

Un = Uncommon: an observer may see few or no trees of this species during a day spent in the appropriate forest type. We include a few generally uncommon species that are locally common or occasional.

Keep in mind that abundance of a species varies widely across forest types and even within its typical forest type.

Similar species

How the species differs from other species resembling it in the La Milpa area. Similarities between a focal species and its similar species are only sometimes stated. Differences are stated. Genus is abbreviated for similar species in the same genus as the focal species. The page (p) for similar species fully treated in this guide is given. For some similar species not fully treated in this guide (noted as “ng” [not in this guide]) an image of that species is included at lower right. Plant family is

named for similar species not in the same family as the focal species and not themselves covered as a fully-treated species in this guide.

Image credits

Abbreviated image credits (photos and drawings) follow each species account: B = Nicholas Brokaw, EP = Elfriede de Pöll, G = Nancy Garwood, K = Sandra Knapp, P = María Peña-Chocarro, T = Juan Tun-Garrido. Credit sequence matches image sequence: clockwise from upper left. Credits sometimes include notes on photos. Uncredited images are by Brokaw. Photos and drawings not by Brokaw appeared in Peña-Chocarro et al. (2011) and are used here by permission. Photos by Brokaw are from the La Milpa area, except as noted. Other photos come from elsewhere in Belize; the Yucatan Peninsula, Mexico; Petén, Guatemala; or Puerto Rico.

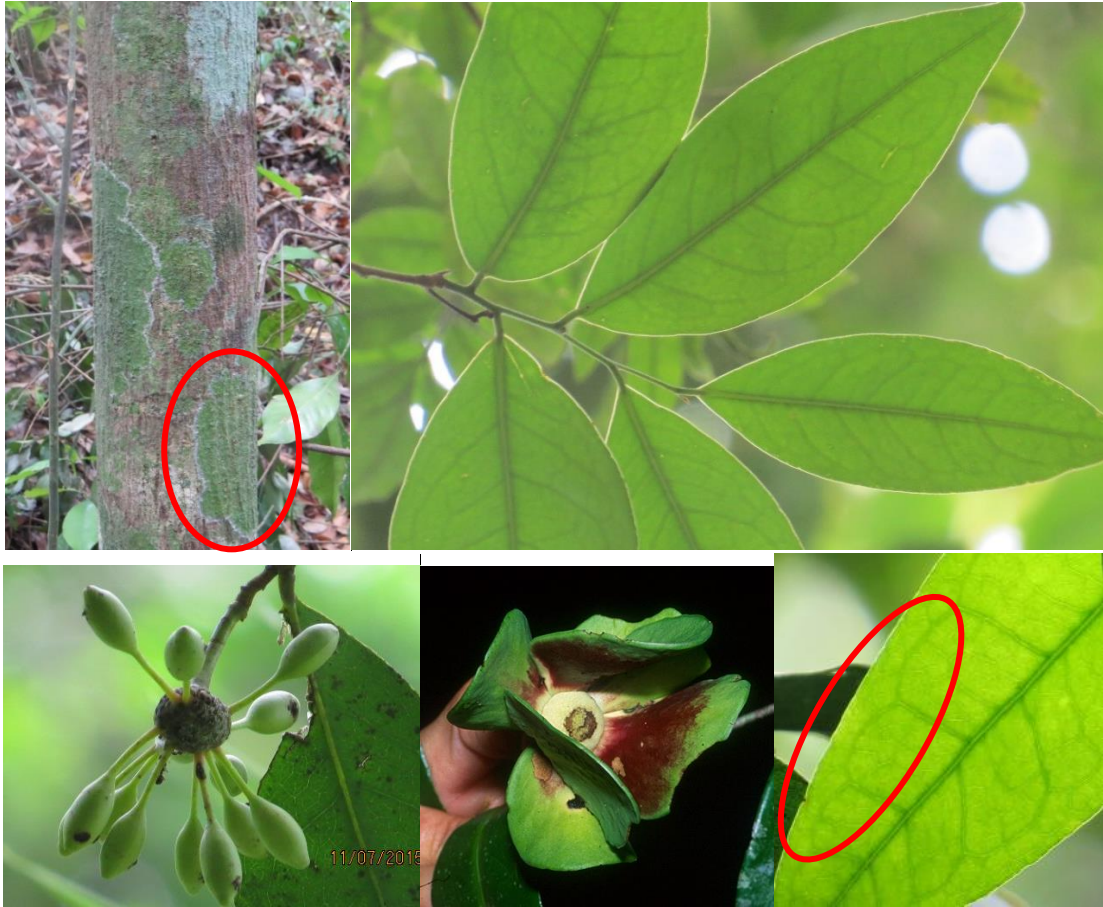


Roystonea regia, royal palm

1 SIMPLE ALTERNATE LEAVES

Mosannona depressa (Baill.) Chatrou – lancewood, wild soursop

Annonaceae



Key features: small tree, bark with green stripes, venation obscure, connecting vein

Form: small **Bark:** patches of green vertical strips produced by slight fissures and green lichens

Leaf: brown spots often present; venation obscure, vague connecting vein distant from leaf margin

Flower: green, fleshy **Fruit:** berry, on stalks

Ecology: dry (mainly) and moist upland forest understory; *Co*

Similar species: *Annona primigenia* (right, ng) has similar bark but larger, thinner leaves (less breadth between top and bottom surfaces) and occurs on edges. *Nectandra coriacea* (p 29) is a shrub, with “Lauraceous venation” (p 29); *Drypetes lateriflora* (p 48) leaves are asymmetric at base and lack the connecting vein, and its bark is scaly and not greenish.

B, B, B, K (flower), B

Annona primigenia



Xylopiia frutescens Aubl. – polewood

Annonaceae



Key features: trunk monopodial; branches thin, radiating; leaves small, two-ranked, bluish-green below; secondary forest

Form: medium; trunk monopodial; branches thin, radiating

Bark: smooth

Leaf: small, two-ranked; petiole short; blade bluish-green below; venation obscure; looks compound because leaves are small and two-ranked

Flower: in axils or along twig **Fruit:** capsule, red, with four fruits

Ecology: edges, secondary forest; *Oc*

Similar species: This species has a unique form and appearance.

B, B, B (Cayo, Belize), B (leaf topside), B (leaf underside)

Aspidosperma cruentum Woodson – mylady

Apocynaceae



Key features: trunk slender for its height; bark orangeish; leaf narrow; veins fine, parallel, obscure

Form: large, tall and slender for its height; trunk round, usually ~monopodial; crown small **Bark:** orangeish; smooth, becoming scaly; sap pale orange (sometimes white in juveniles)

Leaf: rigid-looking, upright at tree top; blade narrow, leathery; veins fine, parallel, obscure

Flower: greenish-yellow, in cymes **Fruit:** pod large, asymmetric; seeds with large, circular wing, thin stalk at center

Ecology: All forest types but bajo; seems to exploit small gaps and grow to the canopy fast; thus one seldom sees mid-size stems, and the tree attains its tall, slender form; *Co*

Similar species: *A. megalocarpon* (p 16) is not so slender and has whitish bark, broad canopy, and leaves not upright at tree top; *Drypetes lateriflora* (p 48) has leaves less linear, asymmetric at the base, and different bark; *Pouteria amygdalina* (p 54) leaves somewhat resemble those of this species, but *P. amygdalina* has ridged bark.

Aspidosperma megalocarpon Müll. Arg. – white mylady Apocynaceae



Key features: bark smooth and whitish; sapling leaf contrastingly pale green below, adult leaf whitish below

Form: large **Bark:** whitish, smooth

Leaf: sapling leaf dark above and light below, becoming whitish below on large trees; veins obscure; partly deciduous

Flower: in cymes **Fruit:** like fruit of *A. cruentum* (p 15) but smaller

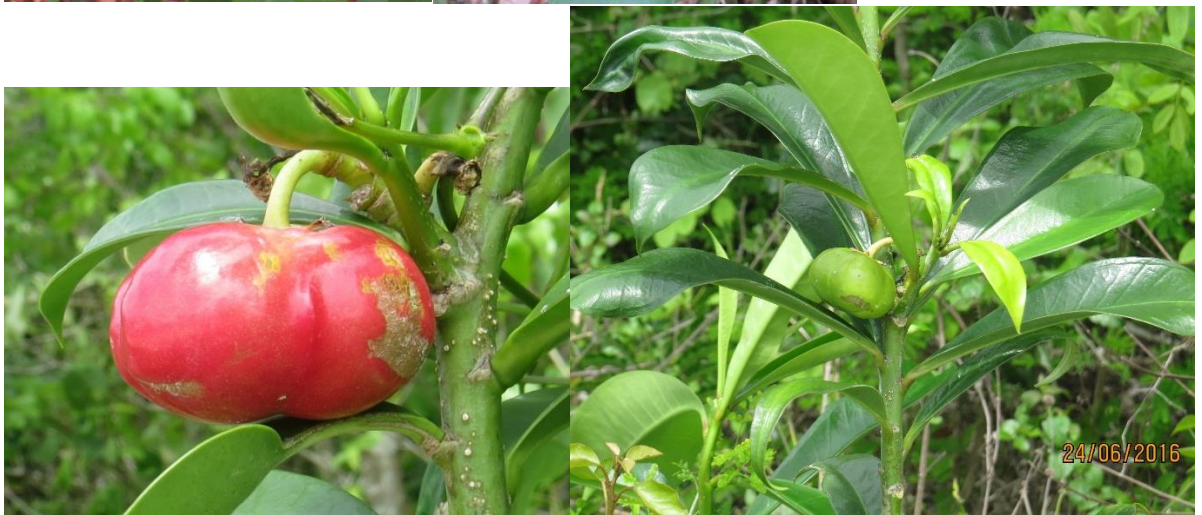
Ecology: moist upland forest; *Oc*

Similar species: *A. cruentum* (p 15) has orangeish bark, narrower canopy, and narrower leaves, these more rigid in appearance and upright at tree top.

B, B, B, B (sapling leaves topside), B (sapling leaves underside)

Thevetia ahouai (L.) DC – cojón de mico

Apocynaceae



Key features: small tree, leaf oblanceolate and fleshy, fruit red; found on edges

Form: small **Bark:** green, becoming light-colored, smooth; sap white

Leaf: oblanceolate, fleshy; connecting vein

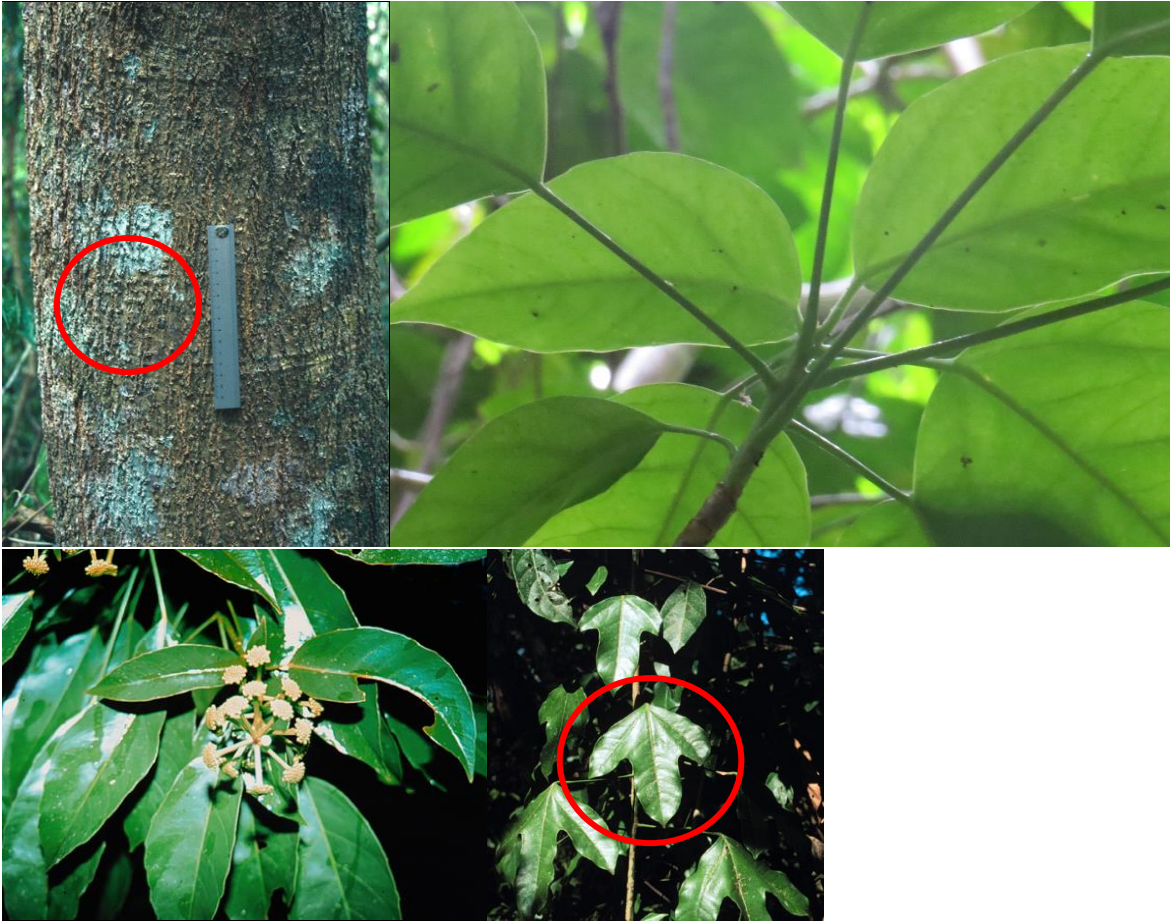
Flower: yellow, with long tube and contorted petals **Fruit:** (photo)

Ecology: edges, forest gaps; *Ab*

Similar species: No species is likely to be confused with this one.

Dendropanax arboreus (L.) Decne. & Planch. – white gombolimbo

Araliaceae



Key features: bark lenticillate, petioles long and of different lengths, leaves of different sizes, sapling leaf often three-lobed

Form: large **Bark:** light gray, shallowly fissured, prominent lenticels

Leaf: petioles long and markedly variable in length; blade size variable; sapling leaf often three-lobed

Flower: (photo) **Fruit:** berry, black to purple

Ecology: secondary forest, moist upland forest; *Oc*

Similar species: *Oreopanax* sp. (right, ng) is usually epiphytic or hemiepiphytic (starts as epiphyte, then roots to the ground), with especially long petioles, broadly ovate leaves, and more conspicuous venation.



Bourreria mollis Standl. – wild craboo

Boraginaceae



Key features: trunk sinuously channeled, bark gray, leaf base wedge-shaped

Form: large; trunk sinuously channeled **Bark:** dark gray (photo upper center shows color too reddish), thin corky ridges

Leaf: broadly elliptic, base wedge-shaped (follows ~45° angle from petiole), thin (little breadth between top and bottom surfaces), nondescript

Flower: white, in terminal clusters **Fruit:** drupe

Ecology: upland forest; *Oc*

Similar species: Other species with irregular trunks: *Diospyros nigra* (p 22) has dark bark and occurs in wet areas; *Ottoschulzia pallida* (p 32) has light-colored, smooth bark; *Ficus* spp. (pp 35-38) are mainly stranglers with distinctive leaves and white sap; *Pouteria* spp. (pp 55-57) have tapered petioles (p 55) and white sap; *Haematoxylum campechianum* (p 109) and *Caesalpinia gaumeri* (p 138) have pinnate and bipinnate leaves, respectively.

B, B (color in photo too reddish), B, B, K

Trema micrantha (L.) Blume – capulín

Cannabaceae



Key features: leaves two-ranked, cordate at base, lightly toothed; veins palmate; found on edges

Form: medium, monopodial; shed branches and twigs accumulate beneath tree **Bark:** light brown and green; smooth, becoming fissured; lenticellate

Leaf: two-ranked; blade gray below, asperous on upper surface, base rounded or cordate and usually asymmetric, lightly toothed; veins palmate

Flower: (photo) **Fruit:** drupe

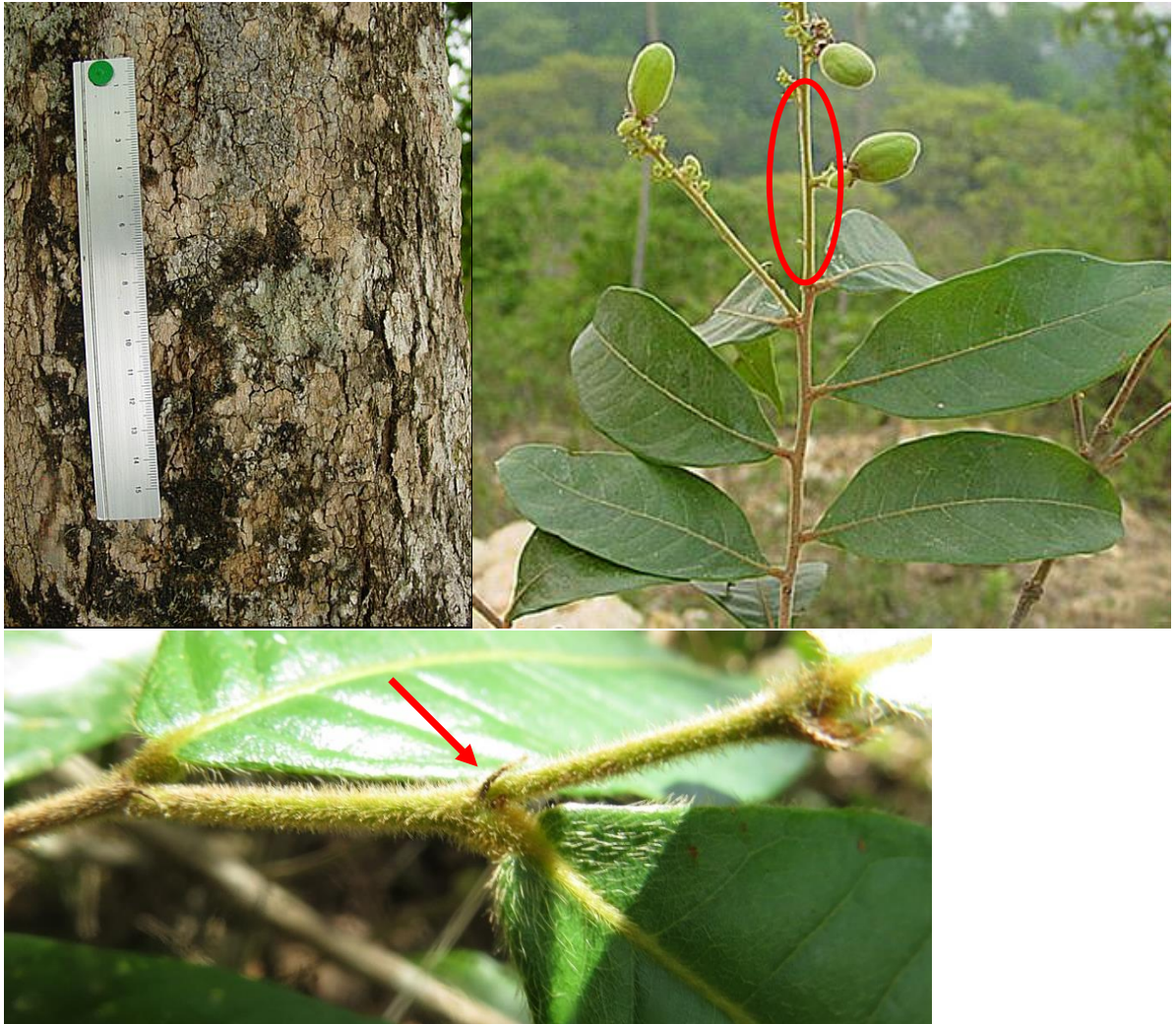
Ecology: edges, treefall gaps; a fast-growing pioneer; *Oc*

Similar species: *Celtis trinervia* (right, ng) has a thinner leaf and coarser teeth; *Ampelocera hottlei* (p 61) lacks cordate, asymmetric leaf base and occurs inside the forest; leaves of *Guazuma ulmifolia* (p 67) and *Muntingia calabura* (Muntingiaceae, photo p 67, ng) are more strongly toothed, and *M. Calabura* is extremely asymmetric at the base.



Hirtella americana L. – pigeon plum

Chrysobalanaceae



Key features: stipules persistent; twig pubescent, giving “halo” effect when backlit

Form: medium **Bark:** brown-gray, scaly

Leaf: petiole short, pubescent; stipule persistent; twig pubescent, giving “halo” effect when backlit

Flower: in panicles or racemes, white to reddish, long stamens **Fruit:** purple or black berry

Ecology: dry (mainly) and moist upland forest; *Co*

Similar species: *H. racemosa* (right, ng) is a smaller tree, in transition forest, its mature twigs not pubescent; *Licaria peckii* (p 28) has pubescent twigs but lacks persistent stipules. *Metopium brownei* (p 104), with ~similar bark, has compound leaves.

T, P, B

Hirtella racemosa

Diospyros nigra (J.F. Gmel.) Perrier – zapote negro

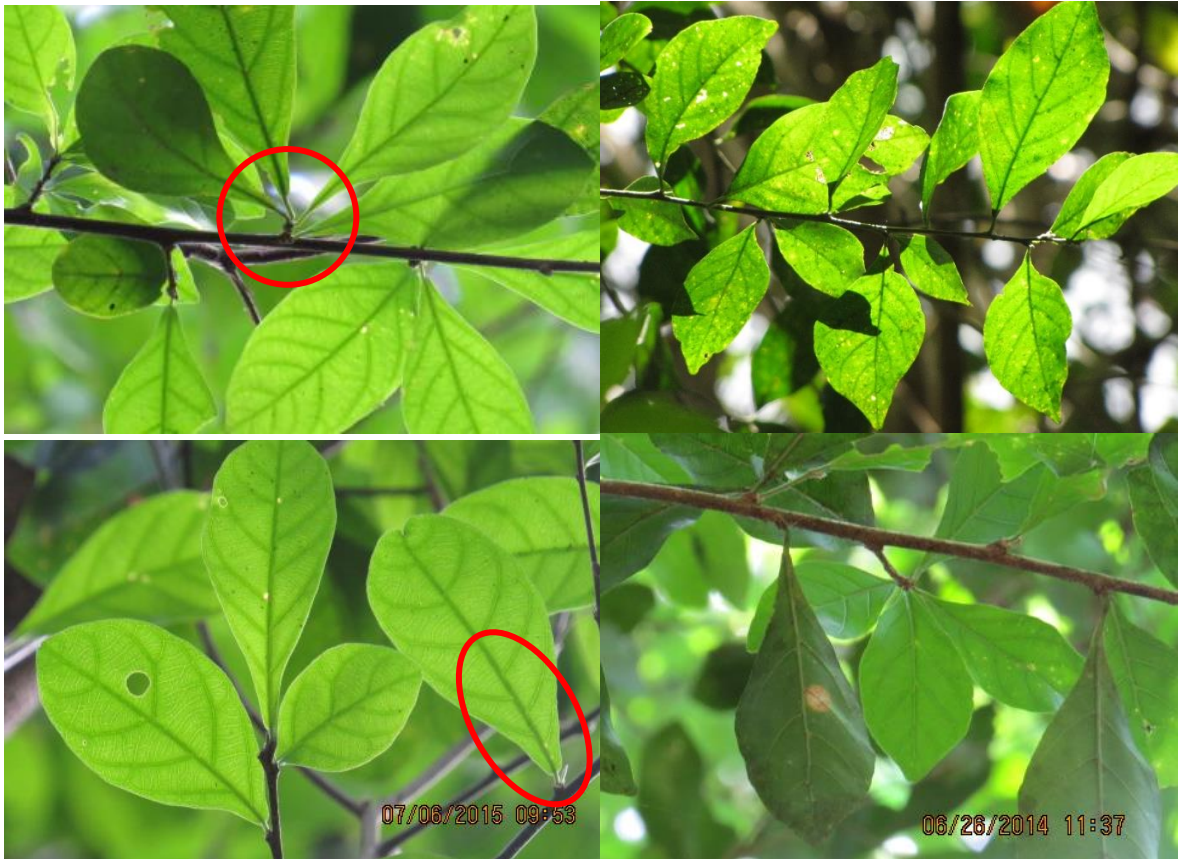
Ebenaceae

**Key features:** trunk channeled and convoluted, bark dark; found in wet areas**Form:** large; trunk channeled and convoluted **Bark:** dark brown, almost black; surface warty**Leaf:** large; light green, oblong; secondary veins conspicuous**Flower:** in axillary cymes **Fruit:** large berry**Ecology:** wet areas, swamps (wooded wetlands); *Un*

Similar species: Other species with irregular trunks: *Bourreria mollis* (p 19) has smaller, elliptic leaves; *Ottoschulzia pallida* (p 32) has light-colored, smooth bark; *Ficus* spp. (pp 35-38) are mainly stranglers, with distinctive leaves and white sap; *Pouteria* spp. (pp 55-57) have tapered petioles (p 55) and white sap; *Haematoxylum campechianum* (p 109) and *Caesalpinia gaumeri* (p 138) have pinnate and bipinnate leaves, respectively. *Licania platypus* (Chrysobalanaceae, right, ng) trunk is columnar; leaves are larger, thicker, two-ranked; rare in our area.

*Licania platypus*

Adelia barbinervis Schlttdl. & Cham. – bastard lemoncillo Euphorbiaceae



Key features: small tree; leaves small, some clustered on short shoots, tapered to base

Form: small tree, or shrub **Bark:** (ni)

Leaf: small, often clustered on short shoots; elliptic to oblanceolate, tapered to base, thin texture

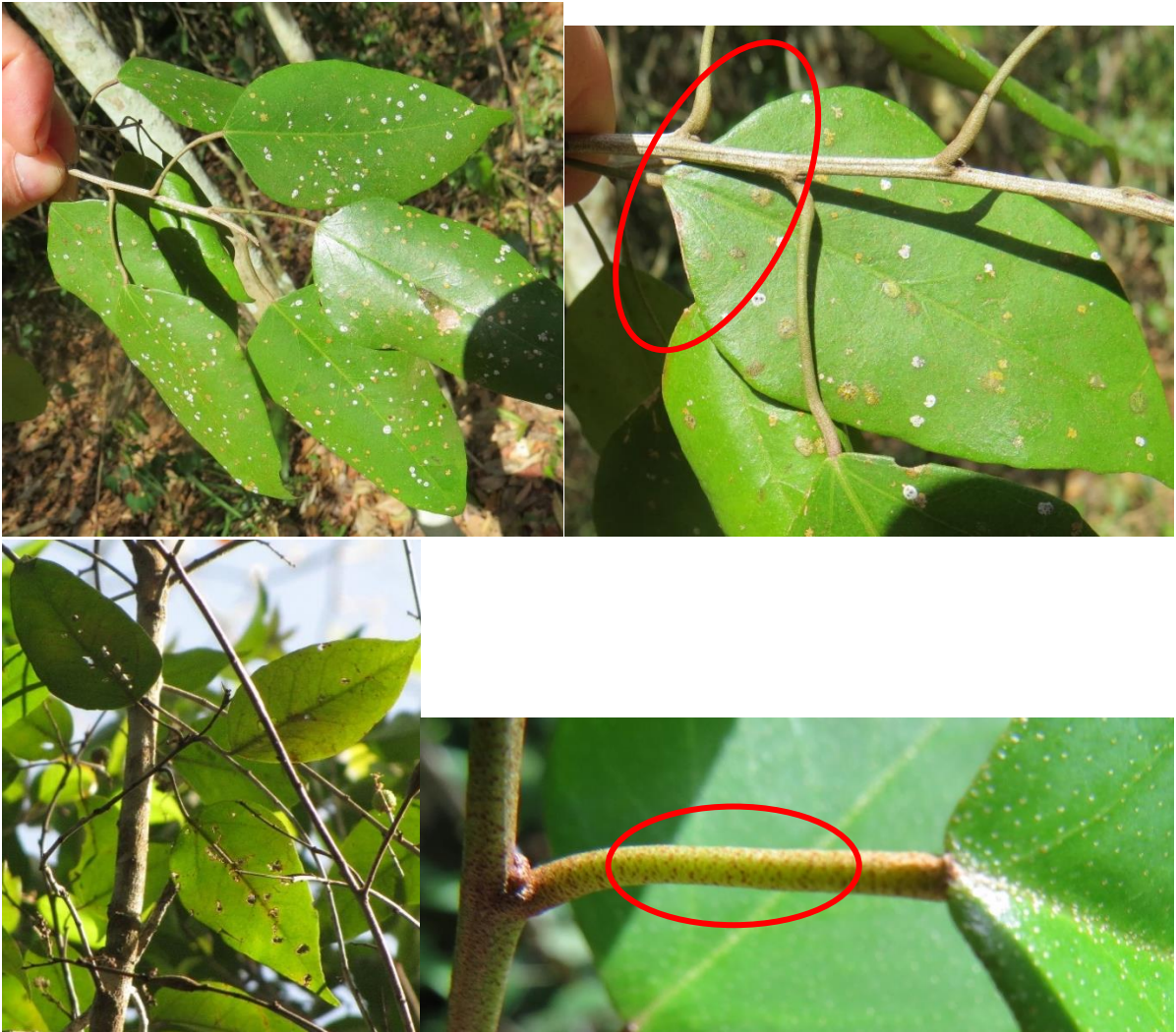
Flower: in fascicles (clusters) in axils **Fruit:** three-lobed capsule

Ecology: mainly riparian forest; *Oc*

Similar species: *Terminalia amazonia* (p 78) and *T. buceras* (p 79) are large trees.

***Croton* sp.** – (ni)

Euphorbiaceae



Key features: small tree; leaf ovate; twig, petiole, and leaf underside dotted; scrubby edges, bajos

Form: small **Bark:** (ni)

Leaf: petiole long; blade ovate (outline of an egg), with wedge-shaped base; twig, petiole, and lower leaf surface dotted with brown scales

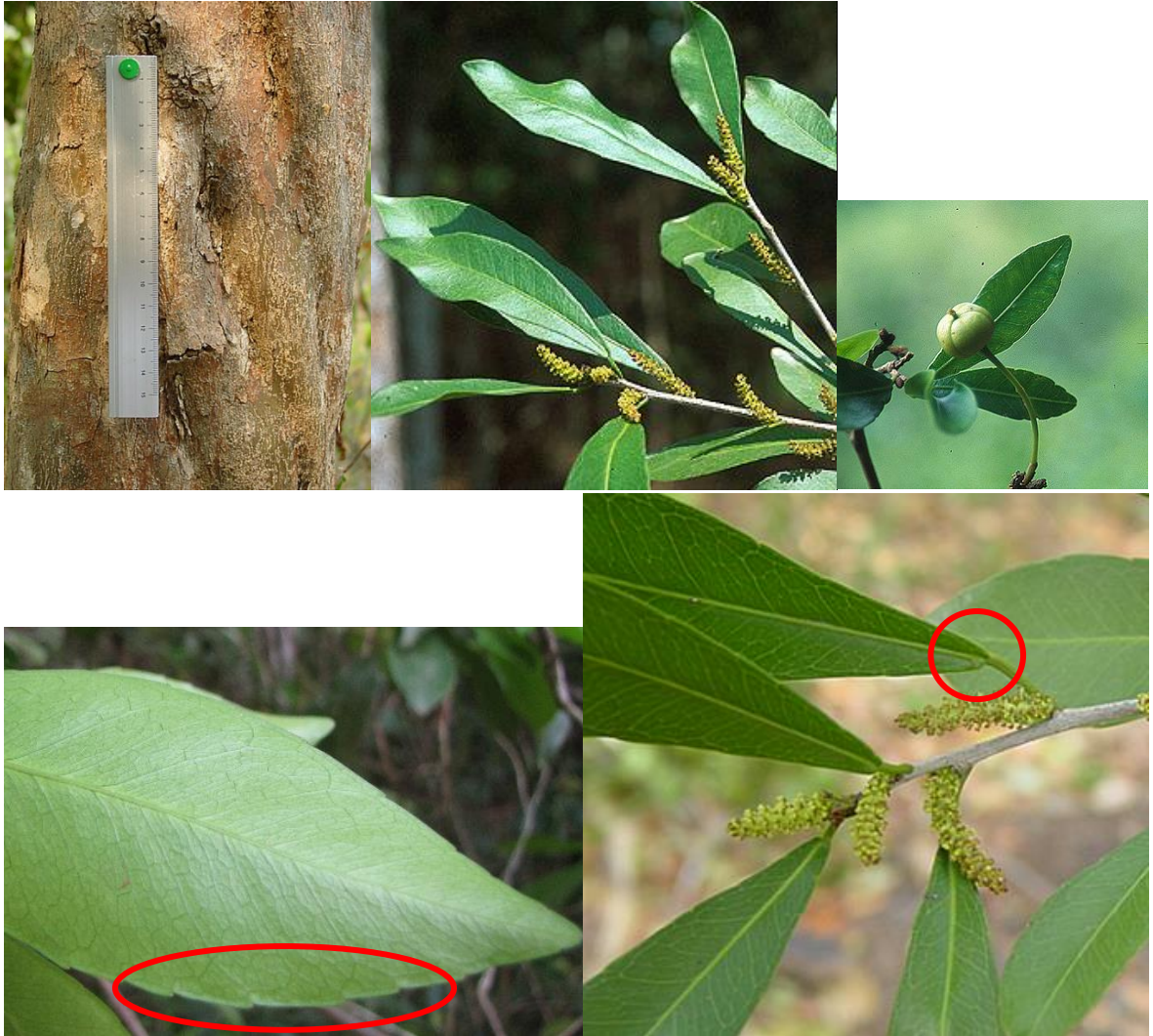
Flower: white, in axillary spikes **Fruit:** capsule

Ecology: edges, bajos, scrubby secondary forest; Co

Similar species: Other *Croton* spp.: sterile distinctions under study.

Gymnanthes lucida Sw. – pi

Euphorbiaceae



Key features: leaf small, narrow-oblongate, toothed toward tip

Form: medium; trunk with rumpled surface **Bark:** tan; smooth, a few scales, hard surface

Leaf: small; blade narrow-oblongate, tapered to a minutely truncate (squared-off) base, lightly toothed toward tip (hard to see), leathery; weak connecting vein evident above, venation finely reticulate below

Flower: (photo) **Fruit:** capsule

Ecology: dry upland forest, transition forest (between upland and bajo); *Oc*

Similar species: *Ficus americana* (p 35) lacks teeth and has twig-encircling leaf scars and a spike-like terminal bud; *Sideroxylon salicifolium* (p 60) is a large tree with entire leaves; *Ouratea lucens* (p 71) has sharper teeth, lacks minutely truncate leaf base, and has distinctive venation.

Quercus oleoides Schltdl. & Cham. – oak, roble

Fagaceae



Key features: large-diameter tree, bark ridged, leaf stiff and short lobed; local distribution

Form: large, with large-diameter trunk and limbs **Bark:** brown, ridged

Leaf: often with short lobes, margin curled downward, stiff

Flower: in catkin (pendant spike) **Fruit:** acorn

Ecology: found in an unusual forest type adjacent to the first gravel pit on right along the road to La Milpa ruins; *Co*

Similar species: *Hyperbaena winzerlingii*

(Menispermaceae, right, ng) occurs in the same forest type and has roughly similar leaves with short lobes, but *H. winzerlingii* is a small tree or shrub, with berry-like fruit.

Hyperbaena winzerlingii



Damburneya nitida (Mez) Trofimov & Rohwer – laurel

Lauraceae



Key features: leaf narrow at base and tip, secondary veins curve to parallel leaf margin;
found on edges

Form: medium **Bark:** fissured

Leaf: narrow, tapered to base, long-pointed at tip; secondary veins curving toward leaf margin
(Lauraceae characteristic, p 29)

Flower: (photo) **Fruit:** berry in cup, similar to fruit p 28

Ecology: edges, occasional in treefall gaps; Co

Similar species: *Nectandra coriacea* (p 29) is a shrub in dry upland forest, with broad-elliptic leaves.

Licaria peckii (Johnst.) Kosterm. – timbersweet

Lauraceae



Key features: bark multi-colored; secondary veins curve to parallel leaf margin; twig pubescent, giving “halo” effect when backlit

Form: large **Bark:** multi-colored in large patches, somewhat scaly

Leaf: bullate, conspicuously pubescent (densely short hairy) below; secondary veins few, curving toward leaf margin, with vague connecting vein; twig conspicuously pubescent, giving halo effect when backlit (p 21)

Flower: (photo) **Fruit:** berry in cup

Ecology: moist upland forest; *Co*

Similar species: *Hirtella americana* (p 21) has conspicuously pubescent twigs but lacks multi-colored, scaly bark and has persistent stipules.

Nectandra coriacea (Sw.) Griseb. – laurel

Lauraceae



Key features: shrub, secondary veins curve to parallel leaf margin, crushed leaf sometimes smells spicy

Form: shrub, sometimes small tree **Bark:** (ni)

Leaf: dark green above, lighter below, smooth, ~leathery; secondary veins curving toward leaf margin (Lauraceae characteristic: eucamptodromous veins – secondary veins curve to parallel leaf margin and join the ends of other secondaries via a series of small cross veins, not connecting veins [Parker 2008]); crushed leaf sometimes gives spicy odor

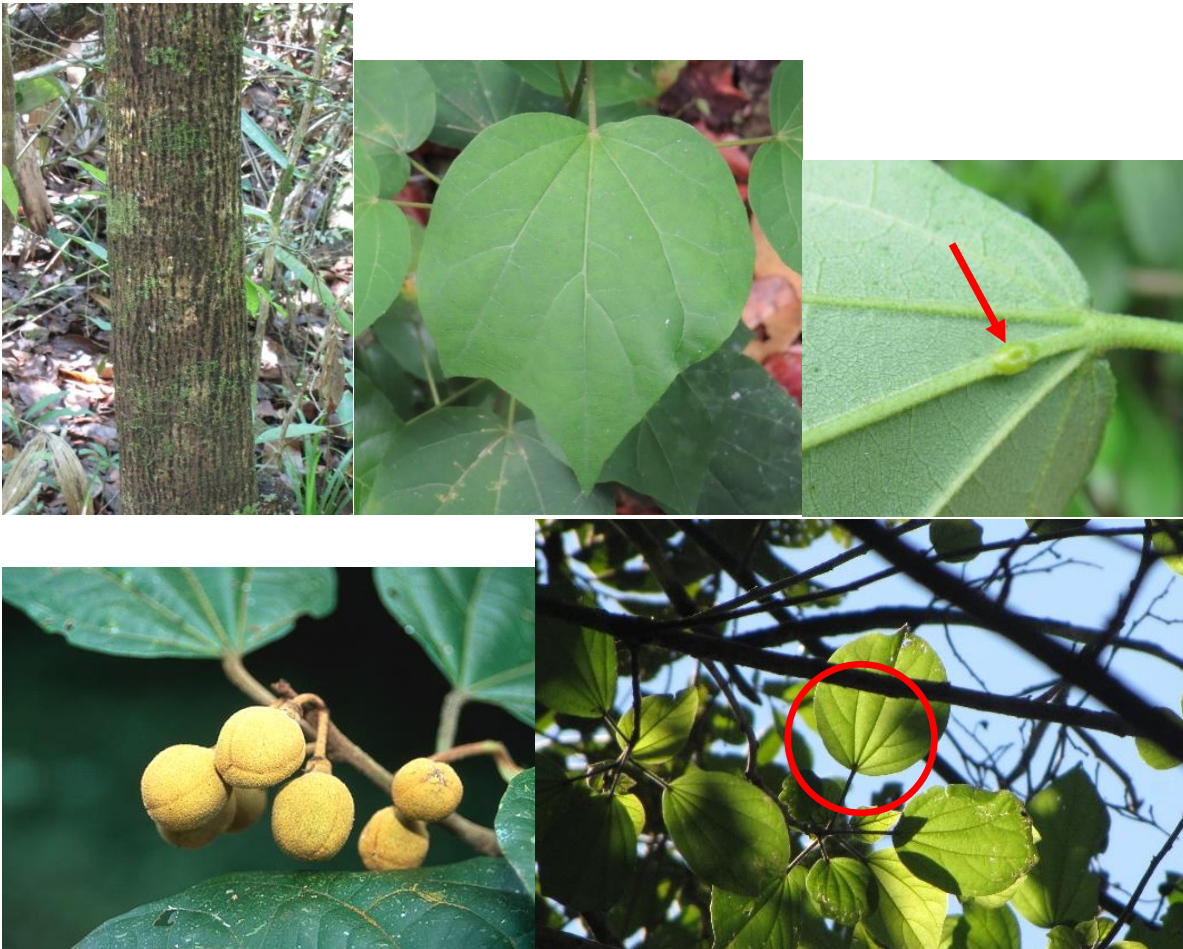
Flower: in panicles **Fruit:** berry in cup, similar to fruit p 28

Ecology: dry upland forest understory; *Ab*

Similar species: *Mosannona depressa* (p 13) lacks “Lauraceous venation”; *Drypetes lateriflora* (p 48) has light green leaves, asymmetric at base.

Hampea cf. trilobata Standl. – moho

Malvaceae



Key features: small tree, veins palmate, gland at base of midvein below

Form: small **Bark:** dark brown to greenish-brown

Leaf: petiole long; blade broad, often shallowly lobed, tip sharp, pubescent below; veins palmate (radiating from base), gland near base of midvein below

Flower: white, in axillary bunches **Fruit:** capsule; seed, black, in white aril

Ecology: edges, young secondary forest; *Oc*

Similar species: *Alchornea latifolia* (p 63) and *Trichospermum lessertianum* (p 69) leaves are toothed; *Bauhinia divaricata* (Fabaceae, right, ng), with its two-lobed, palmately-veined leaf is very roughly similar.

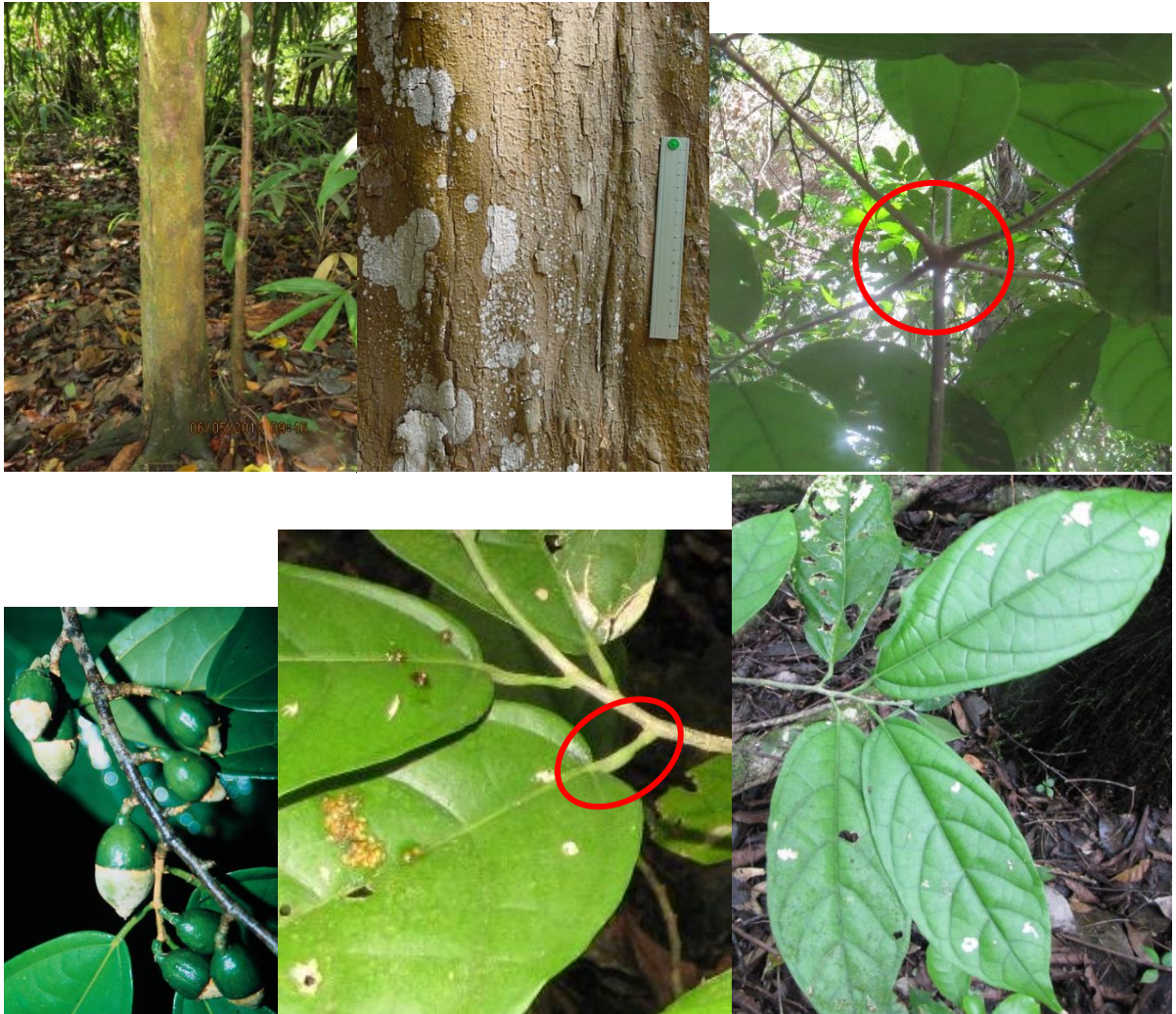
B, P, B, B, P

Bauhinia divaricata



Quararibea funebris (Llave) Vischer – batidos

Malvaceae



Key features: branches verticillate, bark greenish, petiole swollen at apex

Form: large; monopodial, branches verticillate (extending like spokes) **Bark:** greenish-gray; smooth, becoming scaly

Leaf: large, some seem to hang from twig; petiole curved, conspicuously swollen at apex; blade bullate

Flower: white, tubular, opposite leaves on young branches; probably pollinated mostly by non-flying mammals **Fruit:** nut

Ecology: moist and (occasionally) dry upland forest; *Oc*

Similar species: *Guazuma ulmifolia* (p 67) has petioles swollen at the apex but is not verticillate, has a different leaf shape, and occurs on edges.

Ottoschulzia pallida Lundell – (ni)

Metteniusaceae

**Key features: trunk channeled, leaf leathery-looking and usually very broad****Form:** medium; trunk channeled (may be lacking in juveniles) **Bark:** light-colored, smooth**Leaf:** usually broad, almost round, leathery-looking; veins ~obscure**Flower:** (ni) **Fruit:** (ni)**Ecology:** dry upland forest; Co**Similar species:** Other species with irregular trunks: *Bourreria mollis* (p 19) has smaller, elliptic leaves; *Diospyros nigra* (p 22) has dark bark and occurs in wet areas; *Ficus* spp. (pp 35-38) are mainly stranglers, with distinctive leaves and white sap; *Pouteria* spp. (pp 55-57) have tapered petioles (p 55) and white sap; *Haematoxylum campechianum* (p 109) and *Caesalpinia gaumeri* (p 138) have pinnate and bipinnate leaves, respectively. *Brosiumun alicastrum* (p 33) is a larger tree with different leaf.

Brosimum alicastrum Sw. – breadnut, ramón

Moraceae



Key features: very large tree; bark orangeish on small trees; gray and red, scaly on large trees; veins conspicuous, connecting vein; spike-like terminal bud

Form: very large; trunk sometimes channeled, buttresses, dense foliage; leaves ~upright on top branches **Bark:** on smaller trees sometimes orangeish, becoming reddish-gray; smooth, becoming irregularly scaly; sap white (Moraceae characteristic)

Leaf: stipules leaf twig-encircling ring (Moraceae characteristic, except in *Trophis*); blade broad, stiff; veins yellow, conspicuous, connecting vein; twig with spike-like terminal bud; seedling leaf toothed

Flower: in dense, spherical clusters **Fruit:** (photo); tan seed

Ecology: dry and moist upland forest, especially on Maya ruins; *Ab*

Similar species: *Ottoschulzia pallida* (p 32) leaf venation is different; *Pseudolmedia spuria* (p 39) is a smaller tree, with ~smooth, horizontally-lined bark; smaller, narrower leaves (sometimes overlap in size with *B. alicastrum*); and less conspicuous venation. *Ficus* spp. (pp 36-38) have smooth bark and larger leaves.

Castilla elastica Sessé – wild rubber, ule

Moraceae



Key features: monopodial; leaves two-ranked, large, base cordate; sap white

Form: medium; monopodial (having one main trunk, no large branches) **Bark:** light-colored; fine fissures, trunk-encircling rings, sometimes with slashes to extract sap; sap white

Leaf: large, two-ranked, older leaves drooping; base cordate, asperous above, pubescent below, finely toothed (sometimes not visible); veins conspicuous below; deciduous; twigs thick, pubescent, encircled by leaf scars

Flower: minute, clustered in large masses at leaf nodes **Fruit:** multiple (individual fruits joined together), red or orange, disc-shaped

Ecology: edges, gaps, moist secondary forest; *Oc*

Similar species: *Ficus* spp. (pp 36-38) leaves are fleshier and generally not pubescent; *Zuelania guidonia* (p 50) has smaller leaves and transparent sap and lacks twig-encircling leaf scars.

Ficus americana Aubl. – fig, matapalo

Moraceae



Key features: strangler or free-standing, trunk convoluted, leaf small and elliptic, veins obscure, terminal bud spike-like, twig-encircling rings, sap white

Form: large; strangler, with convoluted trunk; free-standing if it outlives its host **Bark:** light gray to slightly reddish; smooth to faintly fissured; sap white (characteristic of Moraceae)

Leaf: small; stipule leaves twig-encircling ring (*Ficus* spp. characteristic); blade elliptic to oblanceolate, narrowly obtuse at base, fleshy; veins obscure; spike-like bud at twig tips

Flower: tiny, many aggregated inside the fig **Fruit:** tiny, aggregated in the fig

Ecology: widespread; establishes as epiphyte and sends roots to ground, gradually surrounds host and may outlive it to become free-standing; or establishes on ground in open areas; *Oc*

Similar species: *F. pertusa* (right, ng) has long petioles, oval leaves. Other stranglers: most *Ficus* spp. (pp 36-38) have larger leaves; *Coussapoa oligocephala* (p 77) is a strangler with leaves narrow, whitish below, and parallel tertiary venation; *Clusia rosea* (p 88) has roundish, opposite leaves. See *Ottoschulzia pallida* and **Similar species** on page 32 for comparisons with other species having irregular trunks.

Ficus pertusa

Ficus cf. costaricana (Liebm.) Miq. – fig

Moraceae



Key features: strangler or free-standing, leaf large and slightly cordate at base, terminal bud spike-like, twig-encircling rings, sap white

Form: large; strangler or free-standing, large buttresses **Bark:** smooth; sap white

Leaf: large; stipule leaves twig-encircling ring; blade round to slightly cordate at base; spike-like bud at twig tip (*Ficus* spp. characteristic)

Flower: tiny, many aggregated inside the fig **Fruit:** tiny, aggregated in the fig

Ecology: widespread; establishes as epiphyte and sends roots to ground, gradually surrounds host and may outlive it to become free-standing; or establishes on ground in open areas; *Oc*

Similar species: *F. maxima* (p 37) has narrower leaves and non-cordate leaf base; *F. obtusifolia* (p 38) has a large, obovate leaf; *F. popenoei* (ng) has a strongly cordate leaf base and pubescent veins below; *Zuelania guidonia* (p 50) and *Sapium lateriflorum* (p 66) have toothed leaves and lack twig-encircling leaf scar and buttresses. *Simira salvadorensis* (101) has large, cordate, but opposite, leaves. See p 35 **Similar species** for comparison with other stranglers. See *Ottoschulzia pallida* and **Similar species** on page 32 for comparisons with other species having channeled or convoluted trunks.

Ficus maxima Mill. – fig

Moraceae



Key features: free-standing, twig-encircling rings, veins conspicuous and palmate at base, connecting vein, terminal bud spike-like, sap white

Form: large; free-standing, not a strangler **Bark:** gray, smooth; sap white

Leaf: stipule leaves twig-encircling ring; blade fleshy, smooth; three veins extending from base, secondary veins yellow, conspicuous, parallel, strong connecting vein; spike-like bud at twig tip (*Ficus* spp. characteristic)

Flower: tiny, many aggregated inside the fig **Fruit:** tiny, aggregated in the fig

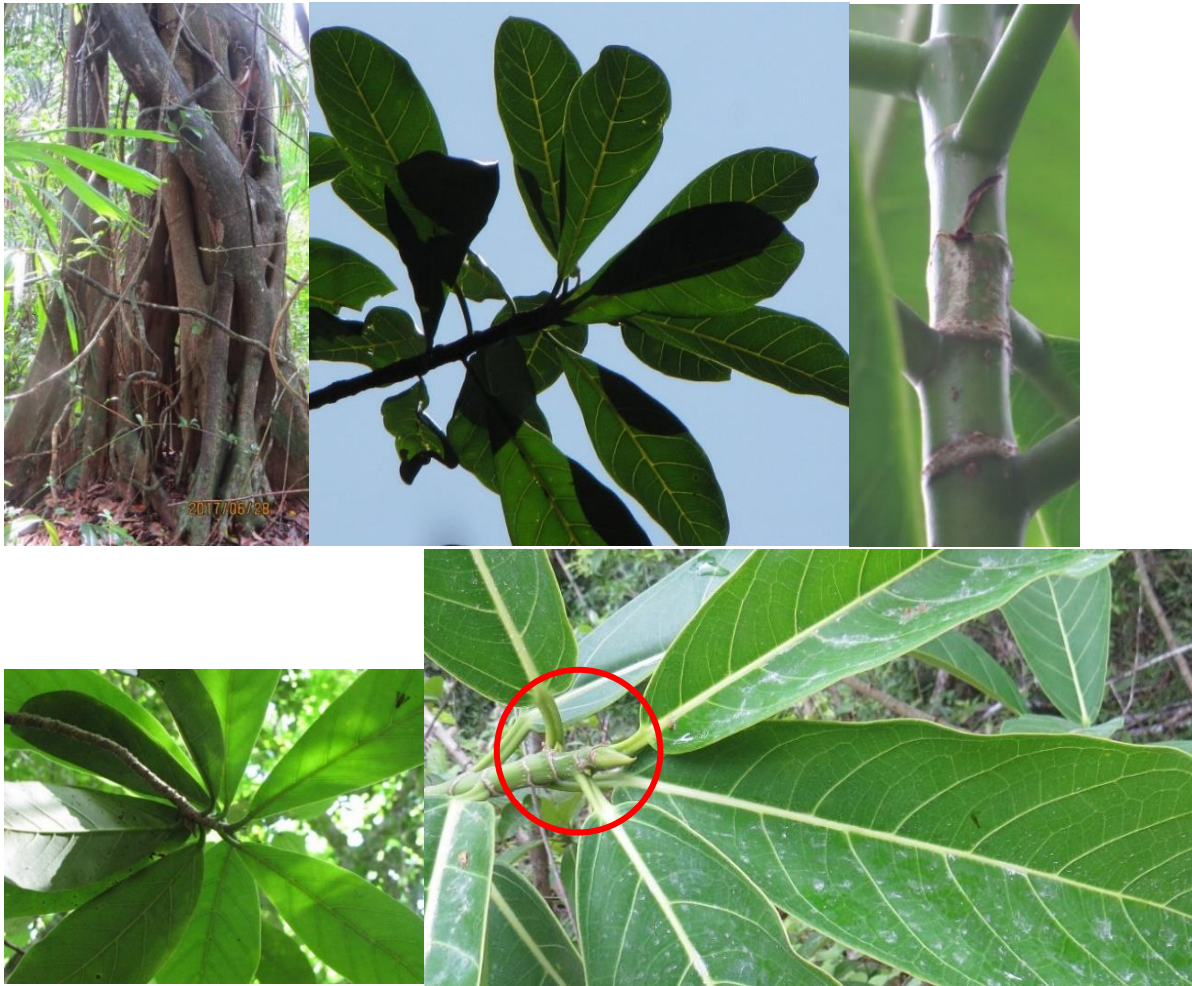
Ecology: widespread; establishes as free-standing tree; *Oc*

Similar species: *F. insipida* (right, ng) is a very large tree, with less conspicuous connecting vein; *F. costaricana* (p 36) has a cordate leaf base; *F. obtusifolia* (p 38) has an obovate leaf; *Sapium lateriflorum* (p 66) lacks terminal spike, has toothed leaves and glands at petiole apex.

*Ficus insipida*

Ficus obtusifolia H.B.K. – fig, matapalo

Moraceae



Key features: strangler, twig-encircling rings, leaves large and obovate, veins conspicuous, terminal bud spike-like, sap white

Form: large; strangler, with intricate, network trunk **Bark:** smooth; sap white

Leaf: large; stipule leaves twig-encircling ring; blade obovate, thick; veins yellow, conspicuous; twigs thick, prominent spike-like bud at tip

Flower: tiny, many aggregated inside the fig **Fruit:** tiny, aggregated in the fig

Ecology: widespread; strangler but can establish as free-standing tree; *Oc*

Similar species: Other *Ficus* spp. (pp 36-38) do not have the large, obovate leaf; *Coussapoa oligocephala* (p 77) is a strangler with leaves whitish below, and parallel tertiary venation.

Pseudolmedia spuria (Sw.) Griseb. – cherry, manax

Moraceae



Key features: bark with horizontal lines, leaf small, twigs zig-zag, terminal bud spike-like, sap white

Form: medium (a few large); no, or small, buttresses **Bark:** light gray; smooth or slightly scaly, with dense, short horizontal lines (elongate lenticels); sap white

Leaf: petiole short; stipule leaves twig-encircling ring; secondary veins conspicuous, connecting vein; twigs zig-zag between leaf nodes; spike-like terminal bud; seedling leaf toothed toward tip

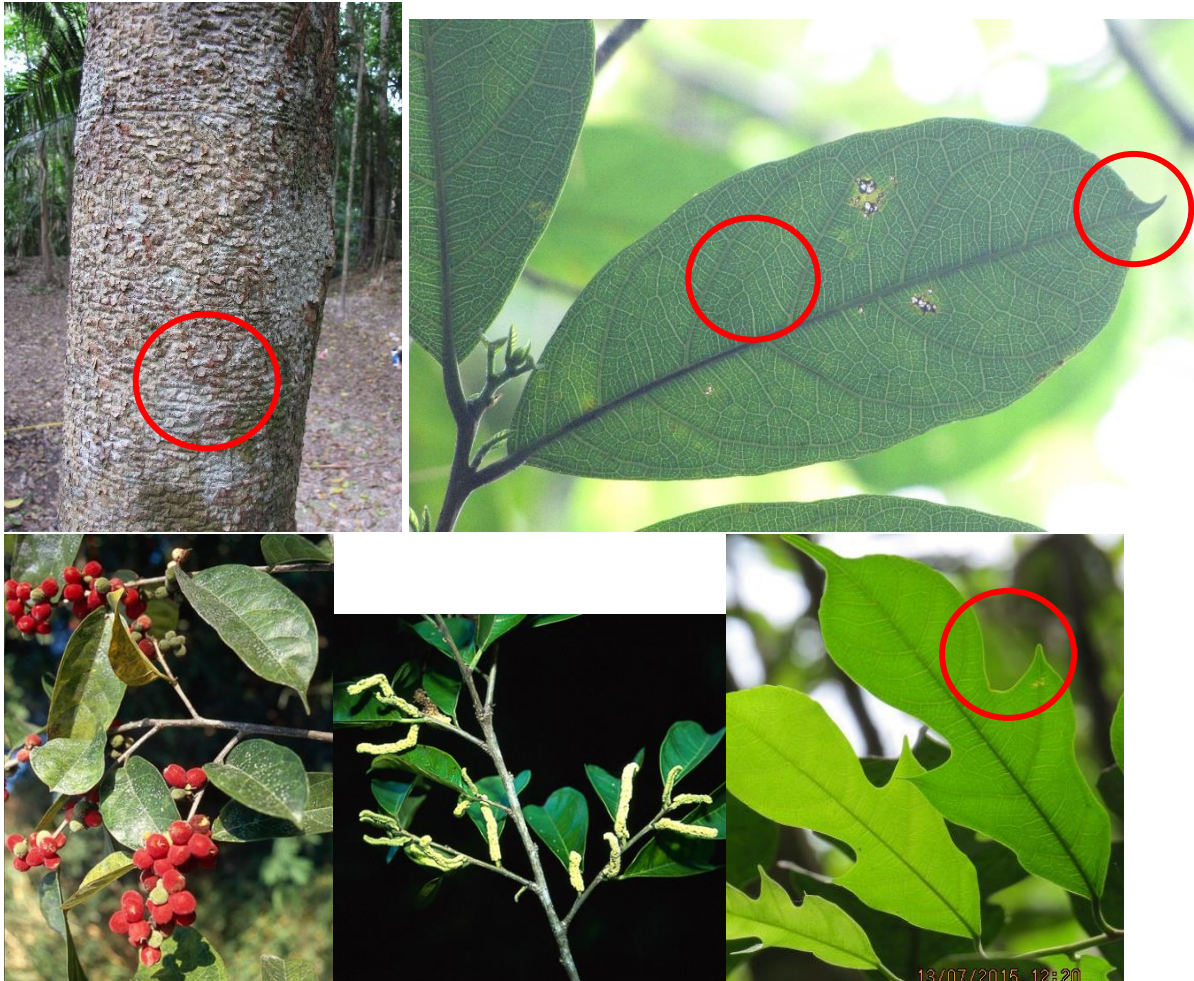
Flower: minute, white, axillary **Fruit:** drupe, red **Ecology:** dry and moist upland forest; *Ab*

Similar species: *Brosimum alicastrum* (p 33) is a larger tree, with buttresses, larger leaves, and more conspicuous venation. Small *B. alicastrum* can resemble *P. spuria* in many features, but *B. alicastrum* venation is more conspicuous. *Ficus americana* (p 35) has different bark and leaves. *B. alicastrum* (p 33), *Trophis racemosa* (p 40), and *Drypetes lateriflora* (p 48) can have similarly-lined bark.

B, B, B, P

Trophis racemosa (L.) Urb. – red breadnut, white ramón

Moraceae



Key features: bark with dense horizontal “blisters”, leaves asperous above, tertiary veins translucent, sapling leaf sometimes lobed

Form: medium **Bark:** reddish gray; dense, horizontally-elongated lenticels, sometimes scaly below; sap white

Leaf: acuminate, sometimes minutely toothed, asperous (sandpapery) above; sapling leaf sometimes lobed; secondary veins arcing toward margin, tertiary veins translucent; unlike other Moraceae, lacks twig-encircling stipule rings and spike-like terminal bud

Flower: male flowers in catkins **Fruit:** (photo)

Ecology: mainly riparian forest, secondary forest; *Co*

Similar species: *Pseudolmedia spuria* (p 39) has ~similar bark but different leaves; *Inga sapindoides* (p 111) and *Ormosia schippii* (p 117) have similar bark but compound leaves; peeling bark on *T. racemosa* may resemble peeling *Bursera simaruba* (p 107), but *B. simaruba* has compound leaves.

Margaritaria nobilis L.f. – clawberry

Phyllanthaceae



Key features: bark scaly, twig conspicuously lenticellate

Form: medium **Bark:** gray and brown; smooth, becoming scaly

Leaf: petiole short; twig with conspicuous lenticels

Flower: green, axillary **Fruit:** capsule, four-parted

Ecology: moist edges; *Uc*

Similar species: *Casearia corymbosa* (p 72) has conspicuous twig lenticels but toothed leaves; *Laetia thamnina* (p 49) is weakly toothed and has an obtuse leaf base.

Piper cf. jacquemontianum Kunth. – cordoncillo, Spanish elder

Piperaceae



Key features: shrub, leaf node swollen, asymmetric leaf base, secondary veins follow leaf margin

Form: shrub **Bark:** (ni)

Leaf: large; asymmetric base, tip long-pointed; secondary veins curve toward leaf margin; twigs swollen at leaf nodes

Flower: minute, aggregated in upright spike **Fruit:** aggregated in white spike

Ecology: upland forest understory where there is relatively high light; *Co*

Similar species: Other *Piper* spp.: sterile distinctions under study; non-*Piper* species with similar leaves lack swollen leaf nodes.

Piper psilorhachis C. DC – Spanish elder

Piperaceae



Key features: shrub, leaf node swollen, leaf small and trinervate

Form: shrub **Bark:** small stems green; smooth, developing corky ridges

Leaf: small; blade trinervate (midvein and vein on each side extend parallel to each other and join at leaf tip); twig swollen at leaf nodes

Flower: aggregated in spike **Fruit:** aggregated in white spike

Ecology: upland forest understory, especially in drier sites; *Ab*

Similar species: Trinervate *Miconia* spp. (p 89, 90), and other Melastomataceae species have opposite leaves.

Coccoloba acapulcensis Standl. – [ni]

Polygonaceae



Key features: small tree; stipule tissue sheathing twig; leaf deeply cordate, appearing peltate

Form: small; sometimes multi-trunked **Bark:** smooth to scaly

Leaf: persistent stipular tissue sheathing twig (Polygonaceae characteristic, p 45); blade deeply cordate, appearing peltate (petiole attached inside leaf margin); blade round, delicate, pinkish when new

Flower: in raceme **Fruit:** berry

Ecology: edges, other areas of high light; *Oc*

Similar species: Deeply cordate leaf distinguishes this species from other *Coccoloba* spp. (pp 45, 46).

P, B, B, B (new leaves)

Coccoloba belizensis Standl. – wild grape

Polygonaceae



Key features: leaf large, stipule tissue sheathing twig, blade bullate and usually cordate at base

Form: medium; sometimes multi-trunked **Bark:** lenticellate

Leaf: large; persistent stipule tissue sheathing twig (Polygonaceae characteristic); blade broad, base usually ~cordate, bullate (swollen between secondary veins), stiff; fallen leaves accumulate conspicuously beneath tree; curved, conical stipule at twig end

Flower: white, in long raceme **Fruit:** berry, reddish-green; raceme persistent on twigs

Ecology: secondary forest, transition forest, bajos; *Oc*

Similar species: The large leaf distinguishes *C. belizensis* from other *Coccoloba* spp. (pp 44, 46).

Coccoloba diversifolia Jacq. – (ni)

Polygonaceae

**Key features:** stipule tissue sheathing twig**Form:** medium to large **Bark:** (ni)**Leaf:** persistent stipule tissue sheathing twig (Polygonaceae characteristic, p 45); blade oval, nondescript**Flower:** in long raceme **Fruit:** (photo) berry; raceme persistent on twigs**Ecology:** (ni); *Oc***Similar species:** *C. acapulcensis* (p 44) has deeply cordate leaves; *Coccoloba belizensis* (p 45) has large leaves; other *Coccoloba* spp.: sterile distinctions under study.

Drypetes brownii Standl. – male bullhoof

Putranjivaceae



Key features: bark with rings; leaf large, leathery, base asymmetric

Form: large, columnar **Bark:** light brown; smooth, many lenticels, with thin horizontal lines almost encircling trunk; uncommon variant has dense lenticels

Leaf: large, ~two-ranked; petiole short; blade dark green, shiny, leathery, base asymmetric

Flower: fascicles in leaf axils **Fruit:** drupe, brown, pubescent

Ecology: dry and (mainly) moist upland forest; *Ab*

Similar species: *Drypetes lateriflora* (p 48) has smaller, light green leaves; *Ampelocera hottlei* (p 61) has larger buttresses, lighter bark, and broader, ~palmately-veined leaves.

B, B, B (bark variant), B, P

Drypetes lateriflora (Sw.) Krug. & Urb. – (ni)

Putranjivaceae



Key features: leaf light green and asymmetric at base, veins obscure

Form: medium **Bark:** light gray; smooth to finely fissured, scaly with age

Leaf: ~two-ranked; base asymmetric, light green, slightly thickened and leathery; veins finely reticulate (forming an irregular network), obscure

Flower: greenish-white, in axils **Fruit:** drupe

Ecology: dry (mainly) and moist upland forest; *Co*

Similar species: *D. brownii* (p 47) has columnar trunk, different bark, larger, darker green leaves;

Mosannonna depressa (p 13) has smooth, greenish bark and an obscure connecting vein;

Aspidosperma cruentum (p 15) leaves are more linear, with different venation; *Nectandra coriacea* (p 29) is a shrub, with “Lauraceous venation” (p 29).

Laetia thamnia L. – bakelak

Salicaceae



Key features: leaf narrowly obtuse at base, weakly toothed

Form: medium **Bark:** scaly

Leaf: petiole short; blade narrowly obtuse at base (feature readily recognizable and diagnostic with experience) and slightly asymmetric, shallowly toothed or ~entire; twig lenticillate

Flower: large, fragrant, in leaf axils **Fruit:** capsule, leathery exterior

Ecology: dry upland forest; *Oc*

Similar species: *Margaritaria nobilis* (p 41) lacks the obtuse leaf base, and its twigs are more heavily lenticillate; *Pouteria reticulata* (p 57) has a wedge-shaped leaf base and twigs not lenticillate; *Casearia corymbosa* (p 72) has coarser teeth and more prominent twig lenticels.

Zuelania guidonia (Sw.) Britt. & Millsp. – water wood

Salicaceae



Key features: monopodial; bark with dense lenticels easily rubbed off; leaf large, base cordate and asymmetric, finely-toothed

Form: large; monopodial **Bark:** yellowish, greenish, or light brown; dense lenticels easily rubbed off; transparent sap

Leaf: two-ranked; petiole densely brown pubescent; base of blade slightly cordate and slightly asymmetric, pubescent below, translucent dots, weakly toothed; deciduous, blade with reddish patches before falling

Flower: whitish, in dense clusters **Fruit:** capsule, large, fleshy, orange within; seed white

Ecology: secondary and upland forest; *Oc*

Similar species: *Castilla elastica* (p 34) has leaves more deeply cordate, twig-encircling leaf scars, white sap; *Ficus* spp. (pp 36-38) have entire leaf margins, twig-encircling leaf scars, and white sap.

Chrysophyllum mexicanum Brandegee ex Standl. – caimito

Sapotaceae



Key features: leaf gold-brown below, veins obscure, sap white

Form: medium **Bark:** fissured, becoming scaly; sap white

Leaf: gold/brown below; secondary veins fine, parallel, obscure; twigs brown-pubescent

Flower: cream-colored, in leaf axils **Fruit:** (photo)

Ecology: riparian forest, secondary forest; *Oc*

Similar species: Cultivated *C. cainito* (ng) has a leaf bright gold below.

P, T, B, B (leaf underside), P

Chrysophyllum venezuelanense (Pierre) T.D. Penn. – sebul Sapotaceae



Key features: petiole base swollen and tapering toward apex, leaf oblanceolate

Form: small to medium **Bark:** (ni); sap white

Leaf: petiole base swollen and tapering toward apex; blade oblanceolate

Flower: axillary fascicles **Fruit:** berry, ~ovate

Ecology: moist upland forest; *Un*

Similar species: *Manilkara zapota* (p 53) has obscure venation; *Pouteria amygdalina* (p 54) has narrow leaves; *P. campechiana* (p 55) has translucent veins; *P. durlandii* (p 56) has a bullate leaf; *P. sapota* (p 58) has a larger leaf.

Manilkara zapota (L.) van Royen – sapodilla, chicle, sapote Sapotaceae



Key features: very large size, bark usually with slashes, leaves clustered on upcurving twig, sap white

Form: very large **Bark:** brown; ridged, usually slashed; sap white (characteristic of Sapotaceae)

Leaf: alternate and clustered on upcurved twig; blade narrow, leathery; secondary veins obscure

Flower: whitish, solitary in leaf axils **Fruit:** large, brown, at twig end; seed large, ellipsoid, shiny brown, conspicuous hilum

Ecology: dry upland and transition forests, occasionally in bajos; *Ab*

Similar species: *M. staminodella* is identical vegetatively except for minute stipules on young branches, visible with a hand lens (Brewer 2021); *M. chicle* (right, ng) has longer leaves and bark not slashed (common at Hill Bank, east of La Milpa); *Aspidosperma cruentum* (p 15) has ~similar leaves with obscure venation, but its bark is smooth and its leaves not clustered; most *Pouteria* spp. (pp 54-58) have conspicuous venation.



Manilkara chicle

Pouteria amygdalina (Standl.) Baehni – silión, silly young Sapotaceae



Key features: large size, bark reddish on buttresses, curved green petiole contrasts with tan twig, leaf narrow

Form: very large; buttresses moderate **Bark:** reddish on buttresses (less so on largest trees), ridged or fissured; sap white

Leaf: clustered at twig tip; petiole long (more so high in tree); green petiole contrasts with brown twig; blade narrow

Flower: cream-colored, in axillary fascicles **Fruit:** small, brown, almond-shaped; seed shiny, brown

Ecology: dry and moist upland forest; *Ab*

Similar species: Other *Pouteria* spp. (pp 55-58) have broader leaves; from a distance *Aspidosperma cruentum* (p 15) has roughly similar leaves, but its venation is obscure and its tree form and bark are different. Trunk, bark, and buttresses resemble *Swietenia macrophylla* (p 123); compare leaves.

Pouteria campechiana (HBK.) Baehni – mamee ciruela

Sapotaceae



Key features: petiole base swollen and tapering toward apex, leaf oblanceolate, veins translucent

Form: large; trunk sometimes channeled **Bark:** brownish-gray, finely ridged; sap white

Leaf: clustered at twig tip; petiole base swollen and tapering toward apex (“pop bottle petiole” [Gentry 1993]); blade oblanceolate, tapered to base; veins prominent and translucent

Flower: in leaf axils **Fruit:** drupe, ~spherical, yellow pulp; seed shiny brown, ellipsoid,

Ecology: dry and moist upland forest; *Co*

Similar species: *P. durlandii* (p 56) lacks translucent veins, has bullate leaves, and is usually a smaller tree; *P. sapota* (p 58) is a larger tree, with more tightly clustered, larger leaves. Other species with irregular trunks: *Bourreria mollis* (p 19) has smaller, elliptic leaves; *Diospyros nigra* (p 22) has dark bark and occurs in wet areas; *Ottoschulzia pallida* (p 32) has light-colored, smooth bark; *Ficus* spp. (pp 36-38) are mainly stranglers, with distinctive leaves; *P. reticulata* (p 57) has a smaller leaf; *Luehea speciosa* (p 68) has a toothed leaf; *Haematoxylum campechianum* (p 109) and *Caesalpinia gaumeri* (p 138) have pinnate and bipinnate leaves, respectively.

Pouteria durlandii (Standl.) Baehni – mamey cerera

Sapotaceae



Key features: leaves large, oblanceolate, bullate; secondary veins conspicuous

Form: medium; trunk sometimes channeled, often with trunk sprouts **Bark:** brownish-gray, finely ridged; sap white

Leaf: ~clustered at twig tip; petiole base swollen and tapering toward apex (see p 55); blade oblanceolate, bullate (swollen between veins); secondary veins conspicuous, dark

Flower: white, in leaf axils **Fruit:** berry

Ecology: dry and moist upland forest; *Oc*

Similar species: *P. campechiana* (p 55) has translucent veins, and its leaves are not bullate; *P.*

sapota (p 58) is a larger tree, with clustered, larger leaves. For other species with irregular trunks see

Similar species on p 55.

Pouteria reticulata (Engler) Eyma – zapotillo

Sapotaceae



Key features: trunk sometimes channeled; leaf arched in cross-section, base wedge-shaped; most abundant large tree at La Milpa

Form: large; trunk channeled in some larger trees **Bark:** brown, finely scaly; sap white

Leaf: base wedge-shaped (cuneate), tip pointed, arched in longitudinal cross-section; veins obscure. The wedge-shaped leaf base is a distinctive field mark for this important but nondescript species; with experience one readily recognizes the leaf base.

Flower: (photo) **Fruit:** small, ellipsoid, hard

Ecology: all forest types but bajo; most abundant large tree at La Milpa, and at Tikal, Guatemala (Schulze & Whitacre 1999); *Ab*

Similar species: Leaves of other *Pouteria* spp. are larger, with conspicuous venation; *Laetia thamnina* (p 49) has an obtuse leaf base. For other species with irregular trunks see **Similar species** on p 55.

Pouteria sapota (Jacq.) H.E. Moore & Stearn – mamee apple Sapotaceae



Key features: leaf large and oblanceolate, veins conspicuous

Form: large; buttresses **Bark:** reddish-brown; fissured and with rectangular scales, sometimes slashed; sap white

Leaf: large; alternate, clustered; petiole reddish, base swollen and tapering toward apex; blade oblanceolate; secondary veins conspicuous

Flower: cream colored, on bare part of twig below leaf clusters **Fruit:** large, tan, flesh orange; seed large, brown, with hilum

Ecology: moist upland forest; *Oc*

Similar species: *P. campechiana* (p 55) and *P. durlandii* (p 56) have darker bark and smaller, less clustered leaves; *Alseis hondurensis* (p 81) has ridged, soft bark, anatomically opposite leaves, and no white sap.

B, B, P, B (opened fruit, orange pulp, seed ~9 cm long)

Sideroxylon foetidissimum Jacq. – cream tree

Sapotaceae



Key features: bark with long, fine, fissures on medium-sized trees; petiole light-colored, very long and thin on upper canopy leaves

Form: large; columnar **Bark:** light gray and tan; long, fine fissures, developing irregular surface of small raised and depressed patches; sap white

Leaf: clustered at twig end; petiole long (less so in juveniles), thin, and light-colored

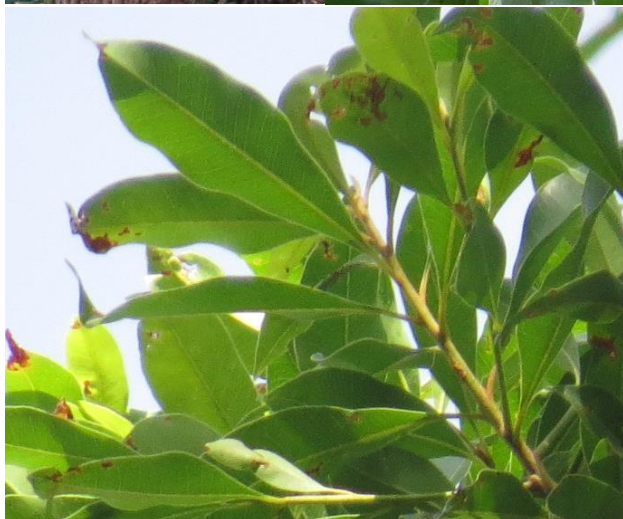
Flower: greenish-white, below leaf cluster, strong fragrance **Fruit:** large, yellow-brown, on bare parts of twigs

Ecology: upland forest; *Oc*

Similar species: Other species with long petioles: *Dendropanax arboreus* (p 18) petioles are of markedly different lengths; *Sapium lateriflorum* (p 66) has toothed leaves and glands at the petiole apex; *Pouteria amygdalina* (p 54) has ridged bark.

Sideroxylon salicifolium (L.) Lam. – faisán

Sapotaceae

**Key features:** bark ridged, leaf small and long-tapered at base**Form:** large; columnar **Bark:** gray, ridged; sap white**Leaf:** small; blade elliptic, long-tapered at base**Flower:** (photo) **Fruit:** berry, yellow-brown**Ecology:** upland forest; *Un***Similar species:** *Ficus americana* (p 35) has twig-encircling leaf scars and a spike-like terminal bud; *Gymnanthes lucida* (p 64) is a smaller tree, with smooth to scaly bark and leaves that are finely toothed; *Terminalia amazonia* (p 78) has clustered, oblanceolate leaves and different bark.

Ampelocera hottlei (Standl.) Standl. – female bullhoof

Ulmaceae



Key features: bark lenticillate, leaves broadly oval, veins ~palmate

Form: large; buttresses **Bark:** smooth, but with prominent lenticels

Leaf: broad, base obtuse, ~leathery; veins palmate, yellow; seedling leaf blue

Flower: few and inconspicuous **Fruit:** drupe

Ecology: local in moist upland forest; banks of seedlings with blue leaves sometimes conspicuous;
Ab

Similar species: *Drypetes brownii* (p 48) has rings around the trunk, an asymmetric leaf base and small, if any, buttresses, and its leaves are not palmately-veined; *Trema micrantha* (p 62) has an asymmetric leaf base and occurs on edges.

2 SIMPLE ALTERNATE TOOTHED LEAVES

Trema micrantha (L.) Blume – capulín

Cannabaceae



Key features: leaves two-ranked, cordate, lightly toothed; veins palmate; found on edges

Form: medium; monopodial; shed branches and twigs accumulate beneath tree **Bark:** light brown and green; smooth, becoming fissured, lenticellate

Leaf: two-ranked; blade gray below, asperous on upper surface, base rounded or cordate and usually asymmetric, lightly toothed; veins palmate

Flower: (photo) **Fruit:** drupe

Ecology: edges, treefall gaps; a fast-growing pioneer; *Oc*

Similar species: *Celtis trinervia* (right, ng) has a thinner leaf and coarser teeth; *Ampelocera hottlei* (p 61) has different leaves and occurs inside the forest; leaves of *Guazuma ulmifolia* (p 67) and *Muntingia calabura* (Muntingiaceae, photo p 67, ng) are more strongly toothed, and *M. Calabura* is extremely asymmetric at the base.

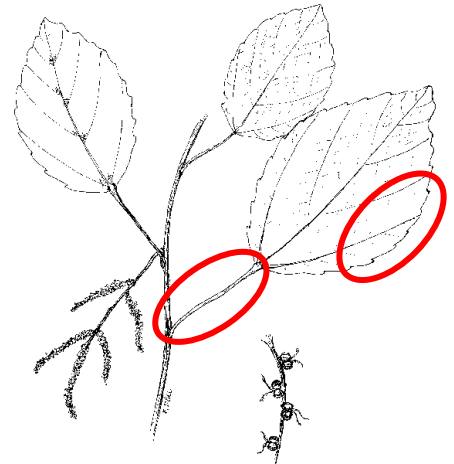
G, B, P, P



Celtis trinervia

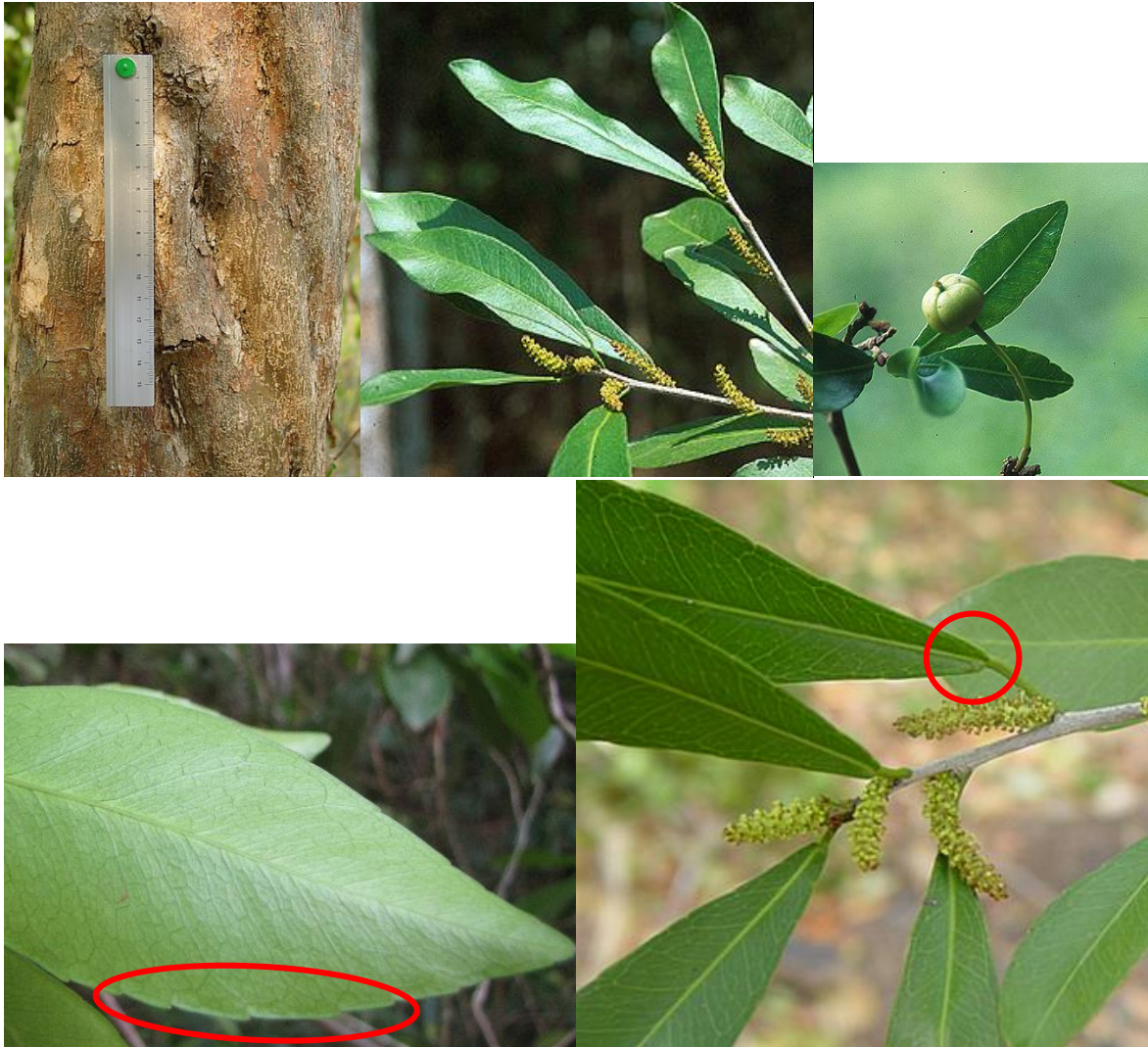
Alchornea latifolia Sw. – fiddlewood, kanak

Euphorbiaceae

**Key features:** petiole long, blade broad and coarsely toothed, veins palmate**Form:** medium **Bark:** gray-tan, smooth**Leaf:** petiole long; blade coarsely toothed; veins palmate, conspicuous; hairs and glands in vein axils below**Flower:** in spikes in leaf axils **Fruit:** capsule**Ecology:** secondary forest; *Un***Similar species:** *Oreopanax* sp. (Araliaceae, photo p 18, ng) is a hemiepiphyte with very long petioles and weakly-toothed or entire leaves; *Hampea trilobata* (p 30) leaves are entire; leaves of *Guazuma ulmifolia* (p 67) and *Luehea speciosa* (p 68) are conspicuously light-colored below, and *L. speciosa* has parallel tertiary venation; *Trichospermum lessertianum* (p 69) leaves are smaller, with a shorter petiole and smaller teeth.

Gymnanthes lucida Sw. – pi

Euphorbiaceae

**Key features:** leaf small, narrow-oblanceolate, toothed toward tip**Form:** medium; trunk with rumpled surface **Bark:** tan; smooth, a few scales, hard surface**Leaf:** small; blade narrow-oblanceolate, tapered to a minutely truncate (squared off) base, lightly toothed toward tip (hard to see), leathery; weak connecting vein evident above, venation finely reticulate below**Flower:** (photo) **Fruit:** capsule**Ecology:** dry upland and transition forest (between upland and bajo); *Oc***Similar species:** *Ficus americana* (p 35) lacks teeth and has twig-encircling leaf scars and a spike-like terminal bud; *Ouratea lucens* (p 71) has sharper teeth, lacks minutely truncate leaf base and has distinctive venation; *Sideroxylon salicifolium* (p 60) is a large tree with ridged bark and entire leaves.

Pleradenophora tuerckheimiana (Pax & K. Hoff.) A.L. Melo & Esser –
white poison wood, chechem blanco

Euphorbiaceae



Key features: petiole yellow, fleshy-looking; leaf thin, weakly toothed

Form: medium **Bark:** brown; fine fissures, small scales

Leaf: two-ranked; petiole light-colored, fleshy-looking; blade long-pointed, weakly toothed, thin (little breadth between top and bottom surfaces), small glands on leaf base above

Flower: axillary spike **Fruit:** three-parted capsule

Ecology: secondary forest, bajos; *Un*

Similar species: *Ficus* spp. (pp 35-38) have thick leaves and twigs and twig-encircling leaf scars; *Sapium lateriflorum* (p 66) has large glands at the petiole apex, not on the leaf; *Casearia corymbosa* (p 72) lacks the yellow petiole and has lenticillate twigs.

Sapium lateriflorum Hemsl. – leche maría

Euphorbiaceae



Key features: trunk-encircling rings; lower leaves at right angle to twig; petiole long, with stalked glands below apex

Form: large **Bark:** light gray-brown, sometimes white patches; smooth or with fine fissures, trunk-encircling rings; sap white

Leaf: lower leaves attached at ~right angle to twig; petiole long, two stalked glands below apex; blade faintly toothed (more conspicuous in juveniles)

Flower: on spikes **Fruit:** capsule

Ecology: edges, secondary forest, gaps in moist upland forest; *Oc*

Similar species: *Ficus* spp. (pp 35-38) have entire leaves, twig-encircling leaf scars, and spike-like terminal bud; *Pleradenophora tuerckheimiana* (p 65) lacks large glands on the petiole.

Guazuma ulmifolia Lam. – bay cedar, bastard cedar

Malvaceae



Key features: petiole swollen at apex; leaf slightly cordate, asymmetric at base; fruit hard, minutely warty; found on edges

Form: medium; branches many, spreading, some low on trunk **Bark:** gray or gray-brown, fissured

Leaf: two-ranked; petiole swollen at apex; blade ~triangular, base rounded to cordate and asymmetric, margins finely toothed, thin; veins palmate

Flower: (photo) **Fruit:** capsule, green becoming black, covered with hard protuberances; sweet smell; accumulates on ground

Ecology: edges, occasional in forest gaps; *Oc*

Similar species: *Trema micrantha* (p 62) lacks petiole swollen at apex; *Luehea speciosa* (p 68) leaf is not asymmetric at base and has parallel tertiary venation; *Trichospermum lessertianum* (p 69) leaves are not asymmetric at base and are green below; *Muntingia calabura* (Muntingiaceae, right, ng) is a smaller tree, leaf very asymmetric at the base.

P, B (underside of leaf), P, P



Muntingia calabura,
in Puerto Rico

Luehea speciosa Willd. – caulote

Malvaceae



Key features: leaf broad, tip abruptly-pointed, whitish beneath; veins palmate, tertiary veins parallel

Form: large; trunk ~channeled when large **Bark:** reddish-brown, irregularly fissured and scaly

Leaf: petiole short; stipule sometimes persistent; blade broad, whitish and pubescent beneath, base rounded to cordate, tip acuminate (abruptly pointed), margin toothed; veins palmate, tertiary veins parallel

Flower: white **Fruit:** capsule; seed winged

Ecology: secondary forest; *Un*

Similar species: *L. seemanii* (ng) leaves are brown below; *Hampea trilobata* (p 30) leaves are entire (without teeth); *Trema micrantha* (p 62) and *Guazuma ulmifolia* (p 67) leaves are asymmetric at base and lack parallel tertiary venation; *Trichospermum lessertianum* (p 69) leaves are green below and have a longer petiole; *Coussapoa oligocephala* (p 77) has similar tertiary venation but is a strangler with longer, narrower leaves.

Trichospermum lessertianum (Hochr.) Dorr – moho

Malvaceae



Key features: bark finely fissured, petiole swollen at both ends, veins palmate; found on edges

Form: medium **Bark:** light yellowish- or greenish-brown; smooth, becoming finely ridged

Leaf: petiole swollen at both ends; blade tip acuminate, finely toothed or ~entire; veins palmate extending to near tip, tufts of hairs in vein axils

Flower: (photo) **Fruit:** capsule, flat, heart-shaped to triangular

Ecology: gaps in moist upland forest, but mainly edges, where it sometimes forms groves; *Co*

Similar species: *Luehea speciosa* (p 68) and other trees with toothed leaves and palmate veins have leaves that are more contrastingly colored above versus below; among those, *Trema micrantha* (p 62) and *Guazuma ulmifolia* (p 67) leaves are asymmetric at base; *Hampea trilobata* (p 30) leaves are entire.

Trophis racemosa (L.) Urb. – red breadnut, white ramón

Moraceae



Key features: bark with dense horizontal “blisters”, leaf asperous above, tertiary veins translucent, sapling leaf sometimes lobed

Form: medium **Bark:** reddish gray; dense, horizontally-elongated lenticels, sometimes scaly below; sap white

Leaf: acuminate, sometimes minutely toothed, asperous (sandpapery) above; sapling leaf sometimes lobed; secondary veins arcing toward margin, tertiary veins translucent; unlike other Moraceae, lacks spike-like terminal bud and twig-encircling ring

Flower: male flowers in catkins **Fruit:** (photo)

Ecology: mainly in riparian forest, secondary forest; *Co*

Similar species: *Pseudolmedia spuria* (p 39) has ~similar bark but different leaves; *Inga sapindoides* (p 111) and *Ormosia schippii* (p 117) have similar bark but compound leaves; peeling bark on *T. racemosa* may resemble peeling *Bursera simaruba* (p 107), but *B. simaruba* has compound leaves.

Ouratea lucens (HBK) Engler – blossomberry

Ochnaceae



Key features: small tree; stipule persistent; leaf stiff, with fine sharp teeth toward tip; veins curving at margin

Form: small **Bark:** (ni)

Leaf: petiole short; stipule brown, persistent; blade narrow, stiff, with sharp, stiff teeth toward tip; midvein raised above and below; other veins obscure, curving along margin and continuing toward tip

Flower: yellow, in terminal panicles **Fruit:** black, borne on a red disk

Ecology: forest of all types, but mainly in transition forest; one of the most widespread woody species in Belize; *Oc*

Similar species: *O. nitida* (right, ng) has a similar stiff, sharply toothed leaf, but the leaf is wider, and the species is mainly in bajos; *Gymnanthes lucida* (p 64) lacks the brown stipule and has a narrower leaf, with weaker teeth; *Alibertia edulis* (p 97) has similar stipules but opposite leaves.

T, B (leaf topside), B (underside), B (topside), B

Ouratea nitida



Casearia corymbosa HBK – paletillo

Salicaceae



Key features: leaf toothed and with translucent dots and lines, twig lenticellate

Form: medium **Bark:** gray, smooth

Leaf: base obtuse, coarse teeth, translucent dots and lines; twig with fine white lenticels

Flower: axillary **Fruit:** capsule; seed arillate

Ecology: secondary moist upland forest, wet areas; *Oc*

Similar species: *Margaritaria nobilis* (p 41) has lenticillate twigs but lacks teeth; *Laetia thamnina* (p 73) has less prominent twig lenticels and finer teeth.

Laetia thamnia L. – bakelak

Salicaceae



Key features: leaf narrowly obtuse at base, weakly toothed

Form: medium **Bark:** scaly

Leaf: petiole short; base of blade narrowly obtuse (feature readily recognizable and diagnostic with experience) and slightly asymmetric, shallowly toothed or ~entire; twigs lenticillate

Flower: large, fragrant, in leaf axils **Fruit:** (photo)

Ecology: dry upland forest; *Oc*

Similar species: *Margaritaria nobilis* (p 41) lacks the obtuse leaf base, and its twigs are more heavily lenticillate; *Pouteria reticulata* (p 57) has a wedge-shaped leaf base and twigs not lenticillate; *Casearia corymbosa* (p 72) has coarser teeth and more prominent twig lenticels.

Zuelania guidonia (Sw.) Britt. & Millsp. – water wood

Salicaceae



Key features: monopodial; bark with dense lenticels easily rubbed off; leaf large, base cordate, finely-toothed

Form: large; monopodial **Bark:** yellowish, greenish, or light brown; dense, uniform lenticels easily rubbed off; sap transparent

Leaf: two-ranked; petioles densely brown pubescent; base of blade slightly cordate and asymmetric, translucent dots, weakly toothed, pubescent below; deciduous, blade with reddish patches before falling

Flower: whitish, in dense clusters **Fruit:** large, fleshy, orange within; seed white

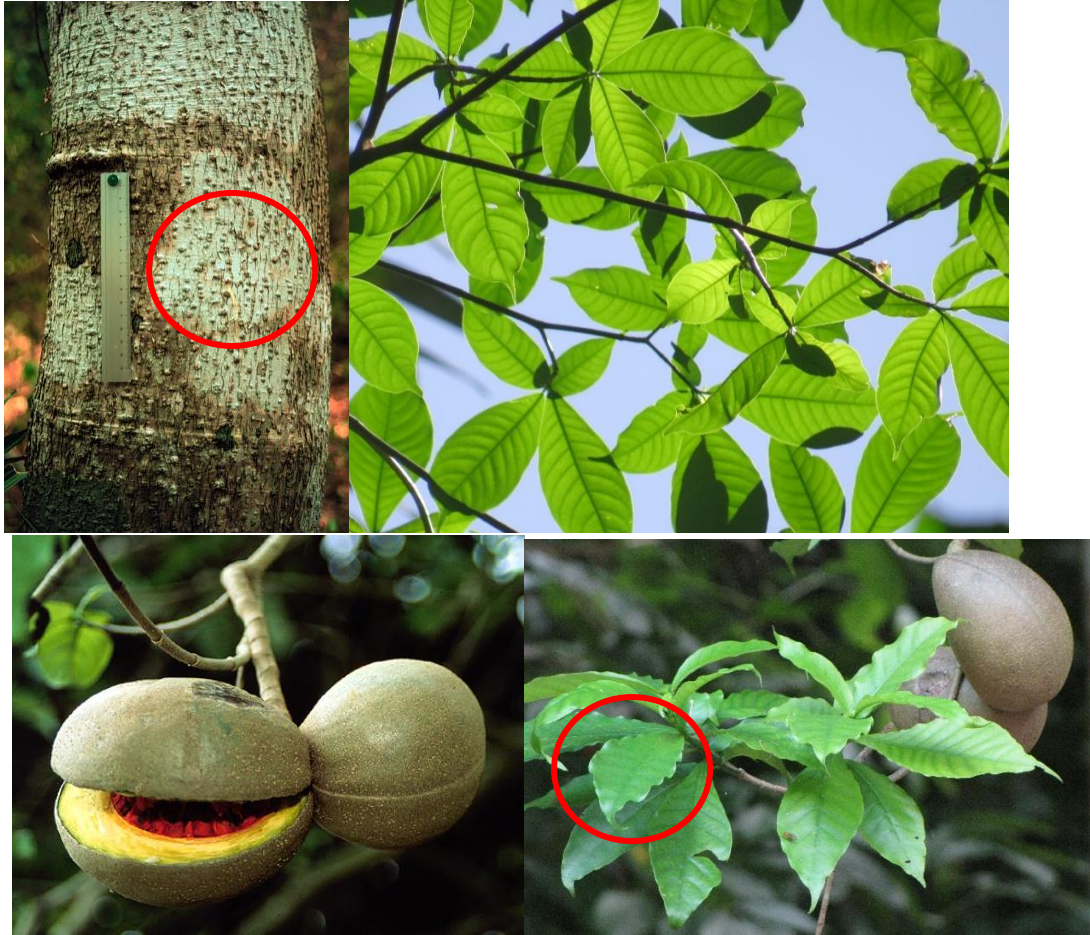
Ecology: secondary and upland forest; *Oc*

Similar species: *Castilla elastica* (p 34) has leaves more deeply cordate, twig-encircling leaf scars, white sap; *Ficus* spp. (pp 36-38) have entire leaf margins, twig-encircling leaf scars, and white sap.

3 SIMPLE CLUSTERED LEAVES

Tabernaemontana donnell-smithii Rose – cojotón, huevos de caballo

Apocynaceae



Key features: bark with prominent lenticels; leaves clustered, margins wavy; sap white

Form: large **Bark:** light-colored; prominent lenticels; sap white

Leaf: opposite and clustered; ~no petiole; blade light green, tip long-pointed; secondary veins parallel, fairly prominent

Flower: yellow, long tube, petals contorted **Fruit:** large, paired, orange within; seed brown

Ecology: moist upland forest, secondary forest; Co

Similar species: *T. alba* (p 85) has similar but smaller fruit and leaves not clustered. Other species with simple leaves and lenticillate bark: *Drypetes brownii* (p 47), *Zuelania guidonia* (p 50), and *Ampelocera hottlei* (p 61) have alternate leaves; *Pseudolmedia spuria* (p 39) and *Trophis racemosa* (p 70) have alternate leaves and horizontally elongated lenticels.

Cecropia peltata L. – trumpet, guarumo

Cecropiaceae



Key features: stilt roots; trunk-encircling rings with triangle leaf scars; leaf large, palmately-lobed; in gaps, on edges

Form: medium; with stilt roots; twig stout **Bark:** smooth, trunk-encircling rings with triangular section (leaf scar)

Leaf: leaves few, large; alternate and clustered; petioles long, pulvinus (swelling at base or apex of petiole) at petiole base large, with glandular area; blade deeply palmately lobed, white-pubescent beneath

Flower: minute, in clustered spikes **Fruit:** minute, in clustered spikes

Ecology: edges, gaps in all forest types; fast growing pioneer; stems house ants that protect the tree from herbivores and vines; *Co*

Similar species: *Cochlospermum vitifolium* (Cochlospermaceae, right, ng; occurs at Hill Bank, east of La Milpa) is a smaller tree, with smaller leaf, and lacks trunk-encircling rings, glandular pulvinus, and ants.

Cochlospermum vitifolium,
Little & Wadsworth 1989



Coussapoa oligocephala Donn. Sm. – matapalo

Cecropiaceae



Key features: strangler becoming free-standing; leaf narrow, whitish below; venation conspicuous

Form: large, strangler, becoming free-standing tree without convoluted trunk **Bark:** reddish, fissured

Leaf: alternate and clustered; blade whitish below, narrow; veins prominent, tertiary veins parallel

Flower: in stalked, compact heads at branch tips **Fruit:** in heads at branch tips

Ecology: upland forest; *Co*

Similar species: Other stranglers: *Ficus* spp. (pp 36-38) have convoluted trunks when free-standing and leaves not whitish below; *Clusia rosea* (p 88) leaves are opposite, roundish, not whitish below and have obscure venation. *Luehea speciosa* (p 68) has similar tertiary venation but a leaf shorter and broader.

Terminalia amazonia (Gmel.) Exell – nargusta

Combretaceae

**Key features: buttresses tan; leaf small, oblanceolate, tip abruptly pointed**

Form: large; buttressed, often with suckers; horizontal layers of branches evident (seen from a distance) **Bark:** light brown, lighter on buttresses; fissured

Leaf: small; alternate and clustered; blade oblanceolate, acuminate; twig brown pubescent, curving up (as with *Manilkara zapota*, p 83); briefly deciduous

Flower: (photo) **Fruit:** small, green turning tan, with two papery wings (green objects in photo)

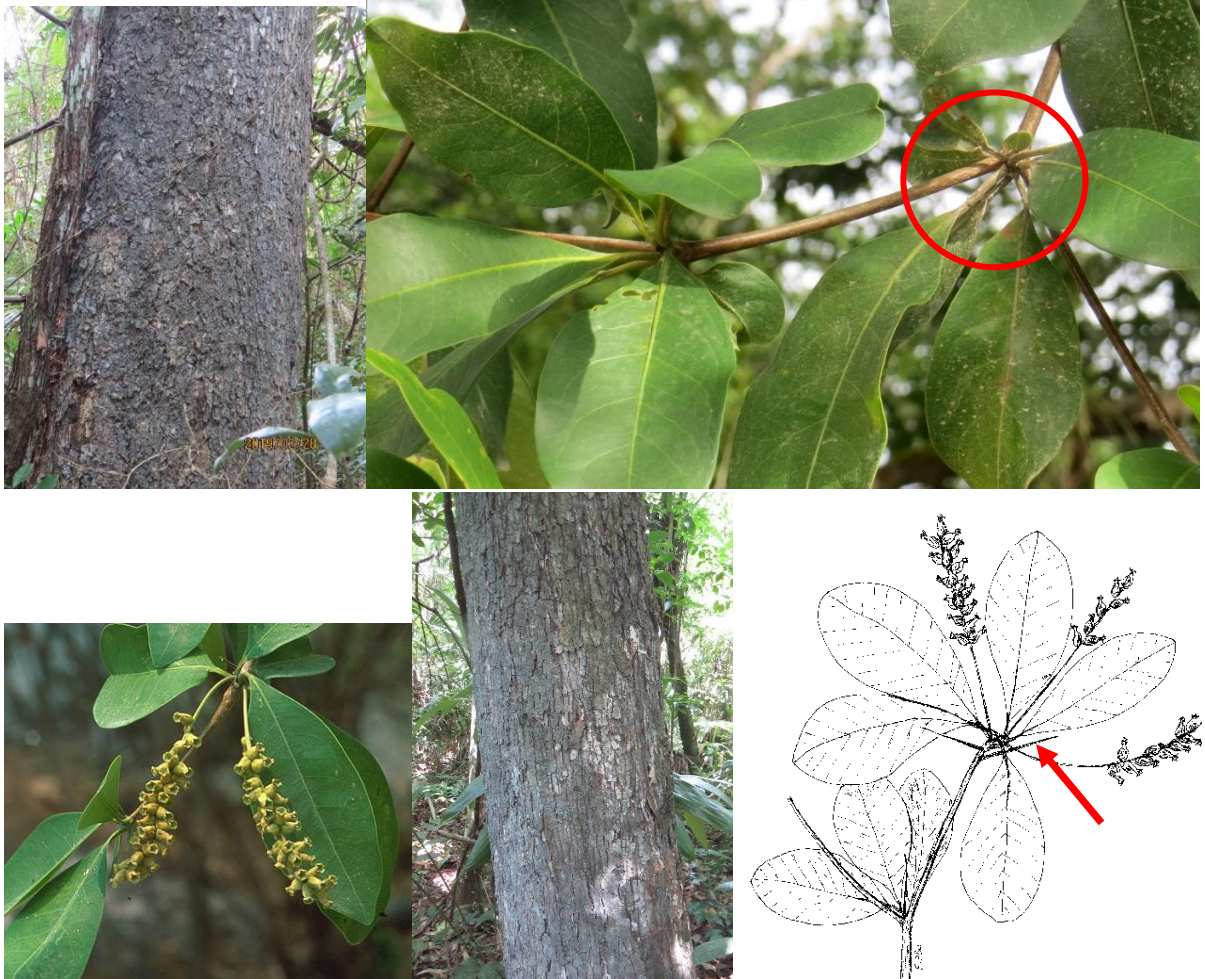
Ecology: mainly transition forest; *Oc*

Similar species: *T. buceras* (p 79) has gray bark, zig-zag twigs, spines at twig nodes, and occurs mainly in wet areas; *Adelia barbinervis* (p 23) is a small tree.

T, B, B, B, P (yellow flowers above, winged fruits below)

Terminalia buceras (L.) C. Wright – bullet tree, pucte

Combretaceae



Key features: very large tree, leaf small and clustered, twigs zig-zag; mainly wet areas

Form: very large; with spreading crown in short or open vegetation; with tall tree form in upland forest **Bark:** gray, fissured and scaly

Leaf: small; alternate and clustered; twigs zig-zag; spines at nodes (not always so long and obvious as in drawing)

Flower: white, in spikes, with long flower stalk **Fruit:** gourd-shaped drupe

Ecology: riparian forest, bajos, banks of rivers and ponds, occasional in moist upland forest; *Co*

Similar species: *T. amazonia* (p 78) has tan bark and oblanceolate leaves and lacks zig-zag twigs and spines.

Dracaena americana Donn. Sm. – candlewood

Dracaenaceae



Key features: small size, branches arching, leaf long and narrow

Form: small; trunk often multiple, branches arching **Bark:** light-colored, large rectangular scales

Leaf: long (20-30 cm), linear, base enclasps twig; veins linear, paralleling long axis of leaf

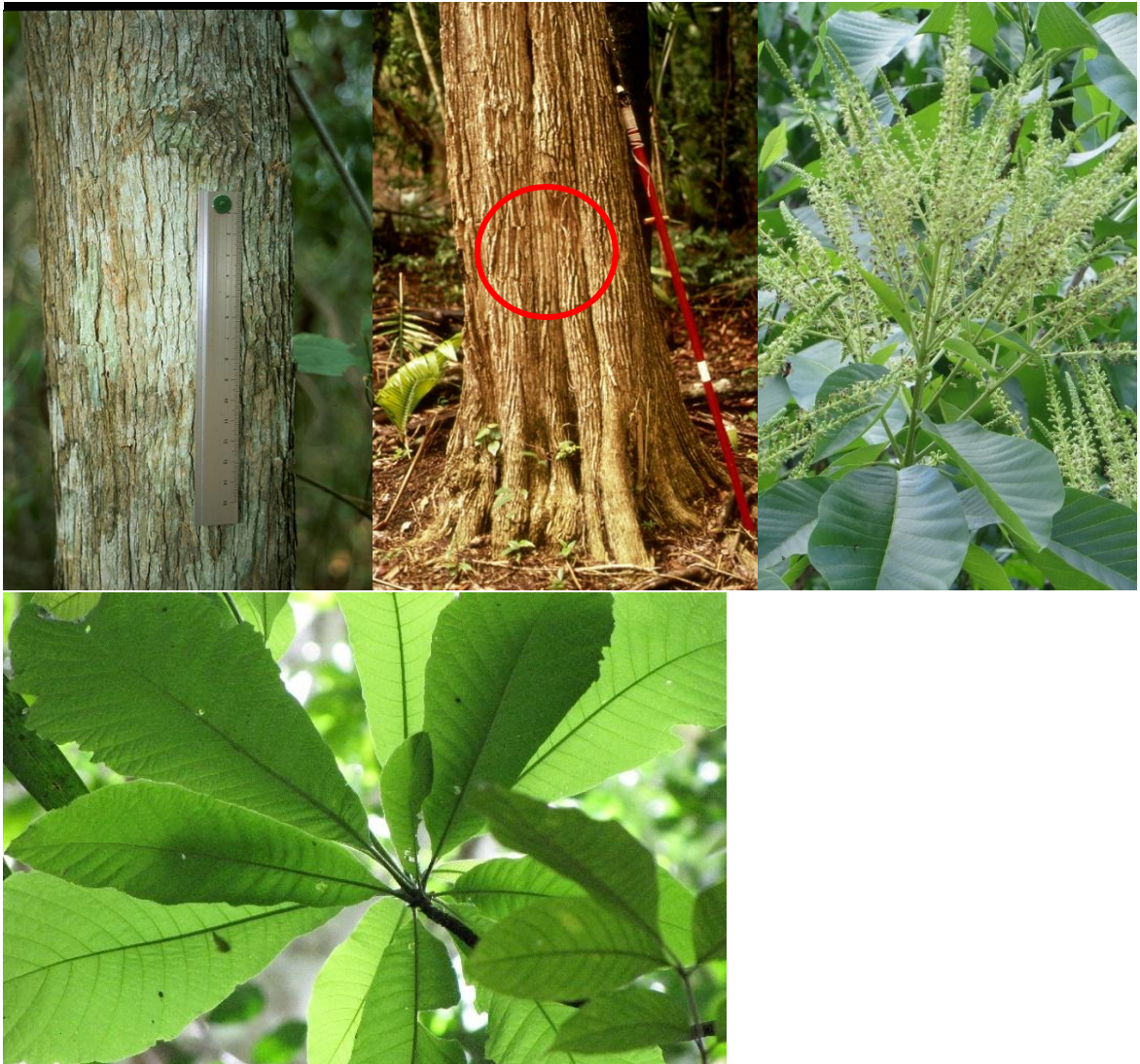
Flower: white, in terminal panicles **Fruit:** berry

Ecology: upland forest; *Un*

Similar species: Palms (pp 154-160) have pinnate or palmate leaves.

Alseis hondurensis Standl. – wild mammee

Rubiaceae



Key features: bark tan, ridges soft; leaf large, oblanceolate

Form: large; mature trunk moderately channeled **Bark:** tan; fissured, developing soft ridges

Leaf: large; opposite and clustered; blade oblanceolate; venation conspicuous

Flower: (photo) **Fruit:** “tiny, narrow brown pods” (Condit et al. 2011), long persisting on the inflorescence structure

Ecology: upland forest; Co

Similar species: *Pouteria campechiana* (p 55) and *P. durlandii* (p 56) have dark bark, alternate leaves, and white sap; *Cosmocalyx spectabilis* (p 82) has scaly bark and long petioles; *P. sapota* (p 84) has fissured bark, leaves that are anatomically alternate, and white sap.

Cosmocalyx spectabilis Standl. – (ni)

Rubiaceae



Key features: petiole long; leaf large, tapered to base, margins wavy

Form: large **Bark:** linear or irregular scales

Leaf: large; opposite and clustered; petiole long; blade tapered to base, margins wavy

Flower: (photo) **Fruit:** (ni)

Ecology: upland forest; *Un*

Similar species: *Alseis hondurensis* (p 81) has a different leaf and tan, ridged bark; *Exostema mexicanum* (p 99) has two-ranked leaves; *Guettarda combsii* (p 100) leaves are round to cordate at base; *Aegiphila monstrosa* (Lamiaceae, right, ng) is a small tree in open areas and lacks interpetiolar stipules and strongly tapered leaf base.

Aegiphila monstrosa



Manilkara zapota (L.) van Royen – sapodilla, chicle, sapote Sapotaceae



Key features: very large tree, bark usually with slashes, leaves clustered on upcurving twig, sap white

Form: very large **Bark:** brown; ridged, usually slashed; sap white (characteristic of Sapotaceae)

Leaf: alternate and clustered on upcurved twig; blade narrow, leathery; secondary veins obscure

Flower: whitish, solitary, in leaf axils **Fruit:** large, brown, at twig ends; seed large, ellipsoid, shiny brown, conspicuous hilum

Ecology: dry upland and transition forests, occasionally in bajos; *Ab*

Similar species: *M. staminodella* is identical vegetatively except for minute stipules on young branches, seen with a hand lens (Brewer 2021); *M. chicle* (right, ng) has longer leaves, bark not slashed (common at Hill Bank, east of La Milpa); *Aspidosperma cruentum* (p 15) has ~similar leaves with obscure venation, but its bark is smooth and its leaves not clustered; most *Pouteria* spp. (pp 54-58) have more conspicuous venation.

Manilkara chicle



Pouteria sapota (Jacq.) H.E. Moore & Stearn – mammee apple Sapotaceae



Key features: leaf large, oblanceolate; secondary veins conspicuous

Form: large; buttresses small **Bark:** reddish-brown; fissured, with rectangular scales, sometimes slashed; sap white

Leaf: large; alternate, clustered; petiole reddish, base swollen and tapering toward apex; blade oblanceolate; secondary veins conspicuous

Flower: cream colored, solitary, on bare part of twig below leaf clusters **Fruit:** large, tan, flesh orange; seed large, brown, with hilum

Ecology: moist upland forest; *Oc*

Similar species: *P. campechiana* (p 55) and *P. durlandii* (p 56) have darker bark and smaller, less clustered leaves; *Alseis hondurensis* (p 81) has ridged, soft bark, anatomically opposite leaves, and no white sap.

B, B, P, B (opened fruit, orange pulp, seed c. 9 cm long)

4 SIMPLE OPPOSITE LEAVES

Note: *Zygia* sp. (p 147) may appear to be simple opposite but is compound-bipinnate.

Tabernaemontana alba Mill. – cojotón, cojón de perro Apocynaceae



Key features: small tree; leaf thick, fleshy, alternating in direction from twig; sap white; found on edges

Form: small **Bark:** (ni); sap white

Leaf: leaf pairs decussate (alternating direction from twig); petiole long, thick; blade smooth, fleshy; secondary veins parallel, prominent

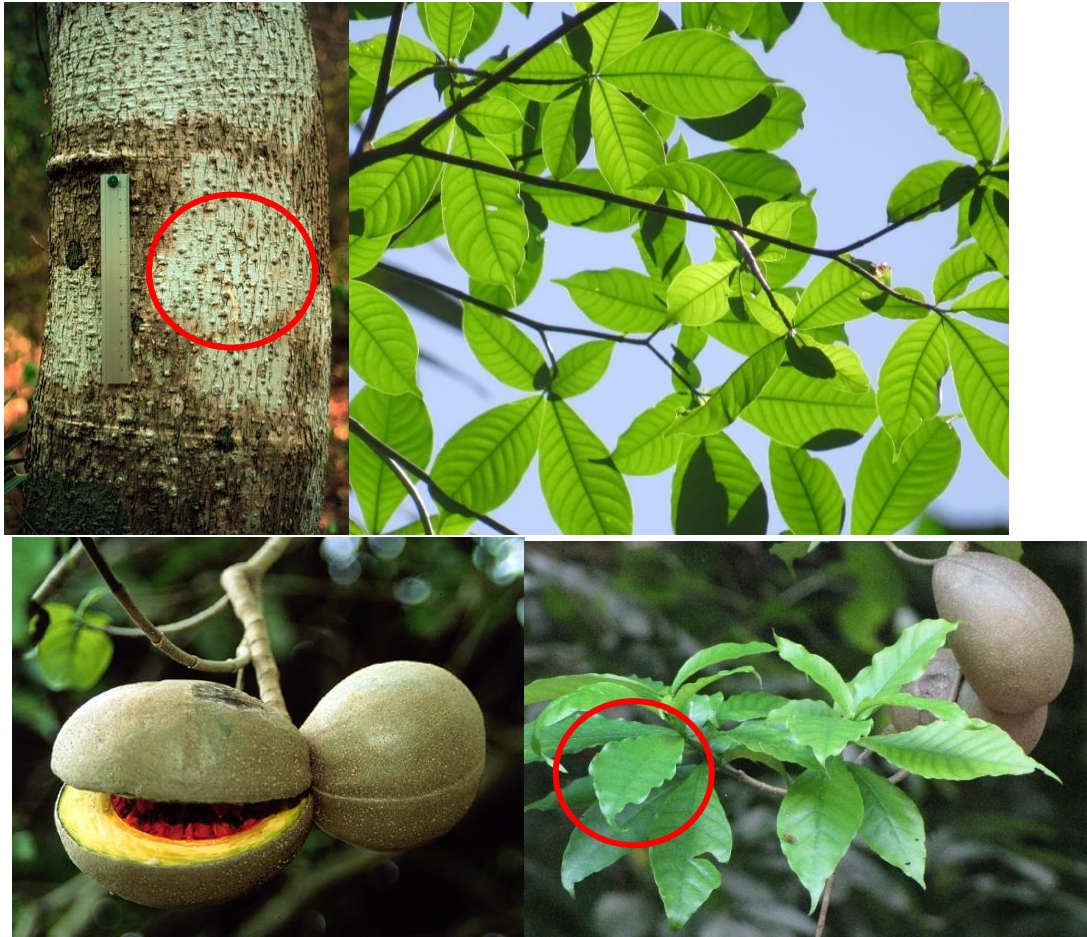
Flower: white, long tube, petals contorted **Fruit:** like that of *T. donnell-smithii* (p 86) but smaller

Ecology: moist upland forest edges, riparian forest; *Oc*

Similar species: *T. donnell-smithii* (p 86) has a similar but larger fruit and is a larger tree, with clustered leaves; Rubiaceae (pp 97-101) have interpetiolar stipules, and they lack thick leaves.

Tabernaemontana donnell-smithii Rose – cojotón, huevos de caballo

Apocynaceae



Key features: bark with prominent lenticels; leaves clustered, margins wavy; sap white

Form: large **Bark:** light-colored, prominent lenticels; sap white

Leaf: opposite or clustered at twig tips; ~no petiole; blade light green, tip long-pointed; secondary veins parallel, fairly prominent

Flower: yellow, long tube, contorted petals **Fruit:** large, paired, orange within; seed brown

Ecology: moist upland forest, secondary forest; *Co*

Similar species: *T. alba* (p 85) has similar but smaller fruit and leaves not clustered. Other species with simple leaves and conspicuously lenticillate bark: *Drypetes brownii* (p 47), *Zuelania guidonia* (p 50), and *Ampelocera hottlei* (p 61) have alternate leaves; *Trophis racemosa* (p 70) and *Pseudolmedia spuria* (p 39) have alternate leaves and horizontally elongated lenticels.

Calophyllum brasiliense Camb. – santa maría

Calophyllaceae



Key features: bark yellowish, fissured or ridged; leaf shiny, stiff; secondary venation finely parallel

Form: large; columnar **Bark:** yellowish; smaller trunks fissured, with ~diamond-shaped “warts”, becoming ridged; sap yellow

Leaf: shiny, stiff; secondary veins finely parallel (like lines in a feather) and obscure; twigs flattened; note that opposite leaf arrangement can be hard to see in upper leaves of large trees

Flower: white, in short racemes **Fruit:** drupe

Ecology: all forest types; often in groups of ~2-4 trees; *Oc*

Similar species: *Aspidosperma cruentum* (p 15) has alternate leaves; *Manilkara zapota* (p 83) has clustered leaves.

Clusia rosea Jacq. – matapalo

Clusiaceae



Key features: hemiepiphytic; aerial roots stiff, warty; leaf broadly obovate, thick

Form: large; hemiepiphytic (starts as epiphyte but then roots to the ground), sometimes becoming self-supporting; aerial roots stiff, arching off central trunk then going straight down **Bark:** gray-brown, aerial roots warty; sap yellow to orange

Leaf: petiole short; blade broadly obovate, thick, conspicuous on ground under tree; veins obscure **Flower:** large, white or pink **Fruit:** capsule, large, leathery, splitting to form star-like object, conspicuous on ground

Ecology: upland forest, transition forest, bajos; *Oc*

Similar species: Other stranglers: *Ficus* spp. (pp 36-38) have convoluted trunks and alternate leaves; *Coussapoa oligocephala* (p 77) has narrow, alternate leaves with conspicuous venation.

Miconia argentea (Sw.) DC. – white maya

Melastomataceae



Key features: bark light tan, peeling; leaf light tan below; veins trinervate, tertiary veins parallel

Form: medium **Bark:** gray-brown to light tan, scaly

Leaf: leaf pairs decussate (alternating direction from twig); petioles long; blade large, whitish or light tan below; veins trinervate (Melastomataceae characteristic, except in *Mouriri*), tertiary veins parallel (Melastomataceae characteristic); twigs tan, flattened in alternating planes

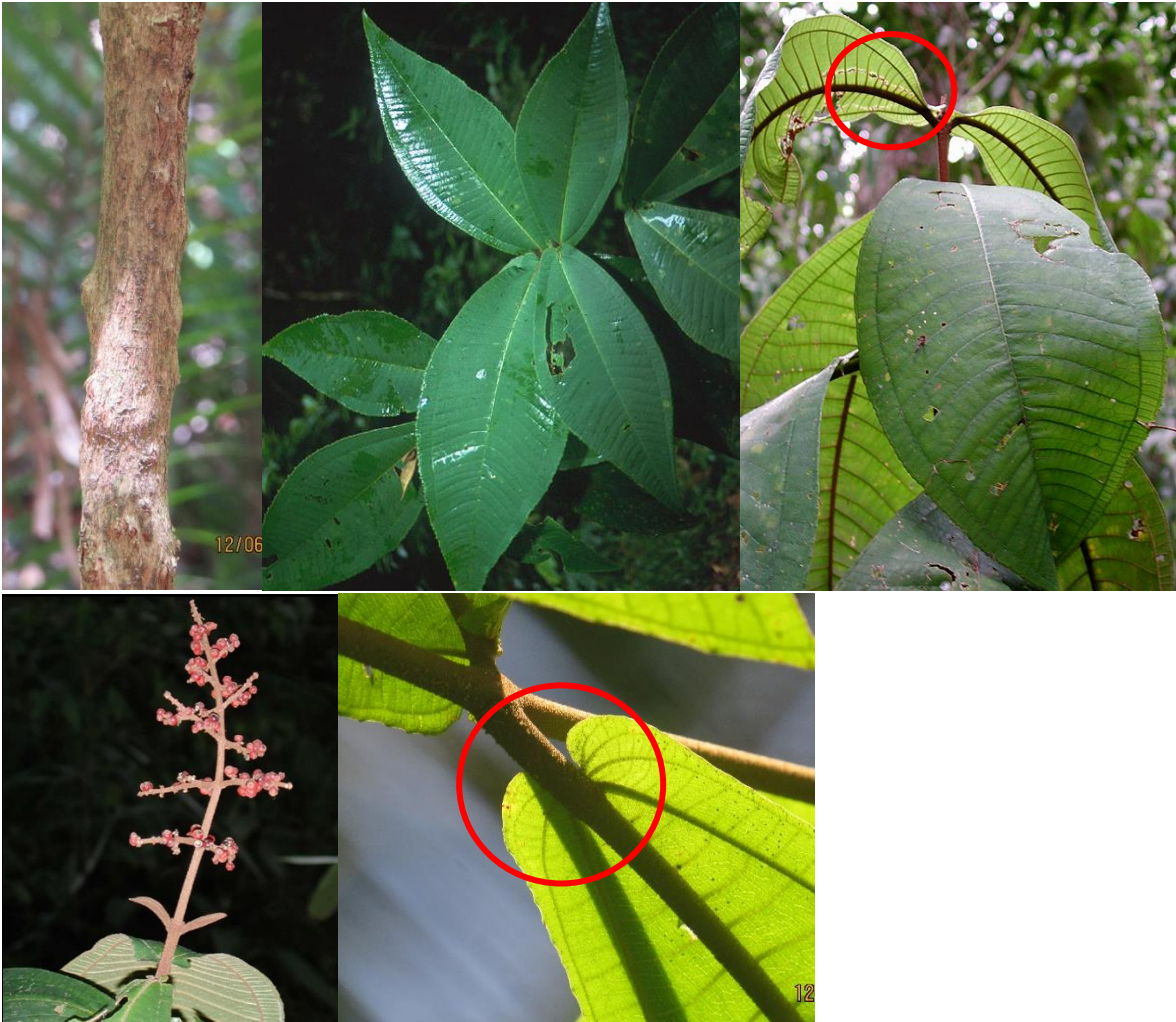
Flower: white, in terminal panicles **Fruit:** blue-purple berry

Ecology: upland forest edges, secondary forest; *Oc*

Similar species: *M. impetolaris* (p 90) has short petioles and a cordate leaf base; *Chrysophyllum mexicanum* (p 51) has alternate leaves and different venation; *Pimenta dioica* (p 94) has similar bark but different venation.

Miconia impetiolearis (Sw.) D. Don – maya

Melastomataceae



Key features: small tree; petiole very short; leaf large, cordate; trinervate, tertiary veins parallel

Form: small tree or shrub **Bark:** (ni)

Leaf: large; petiole very short; blade green above, pale green or reddish below; elliptic, base cordate (seeming to clasp stem), tip pointed; veins trinervate, tertiary veins parallel (Melastomataceae characteristics)

Flower: (photo) **Fruit:** black or blue berry

Ecology: moist upland forest; *Un*

Similar species: *M. argentea* (p 89) and most other Melastomataceae have similar veins but not such large leaves and short petioles.

Mouriri myrtilloides (Sw.) Poir. – jug

Melastomataceae



Key features: small tree; ~no petiole; leaf small, margins wavy; veins obscure

Form: small tree or shrub **Bark:** small scales

Leaf: small, two-ranked; nodes swollen; ~no petiole; blade margin wavy; veins obscure (unlike other Melastomataceae); this species may appear at first glance to have compound leaves

Flower: (photo) **Fruit:** berry, purple or red

Ecology: moist upland forest, transition forest (common at Hill Bank, east of La Milpa); *Un*

Similar species: Other species with small, simple opposite leaves have at least short petioles: Myrtaceae (p 92, 93), *Krugiodendron ferreum* (p 95), *Alibertia edulis* (p 97).

Calyptranthes chytraculia (L.) Sw. – guayabillo

Myrtaceae



Key features: small tree; midvein below conspicuous and pubescent; twig thin, straight, and pubescent; wet areas mostly

Form: small tree or shrub (trunk picture shows unusually large individual) **Bark:** (ni)

Leaf: petiole short, pairs form “U”; blade larger than in many Myrtaceae; midvein beneath tan and pubescent, connecting vein; twig straight, thin

Flower: terminal panicles **Fruit:** berry

Ecology: moist upland forest, edges of wet areas; *Oc*

Similar species: *Rinorea hummellii* (p 102) terminal petioles also form a “U”, but its leaves are not pubescent and have weak teeth. Other Myrtaceae: sterile distinctions under study.

***Myrciaria* sp.** – (ni)

Myrtaceae



Key features: bark mottled red and white, smooth; leaf small, veins obscure

Form: medium **Bark:** red and white patches; smooth, hard, some scales

Leaf: small: petiole short; midvein sunken above, secondary veins obscure

Flower: in racemes **Fruit:** berry

Ecology: dry upland and transition forest; *Un*

Similar species: *Bursera simaruba* (p 107) has compound leaves. Other Myrtaceae are present in the area.

Pimenta dioica (L.) Merrill – allspice, pimienta

Myrtaceae



Key features: bark light tan, with large, peeling scales; leaf with clove odor

Form: large; trunk somewhat channeled, often leaning **Bark:** light tan; large peeling scales, surface hard

Leaf: large; smooth and leathery; twig flattened in alternate planes between leaf nodes; strong clove odor when crushed

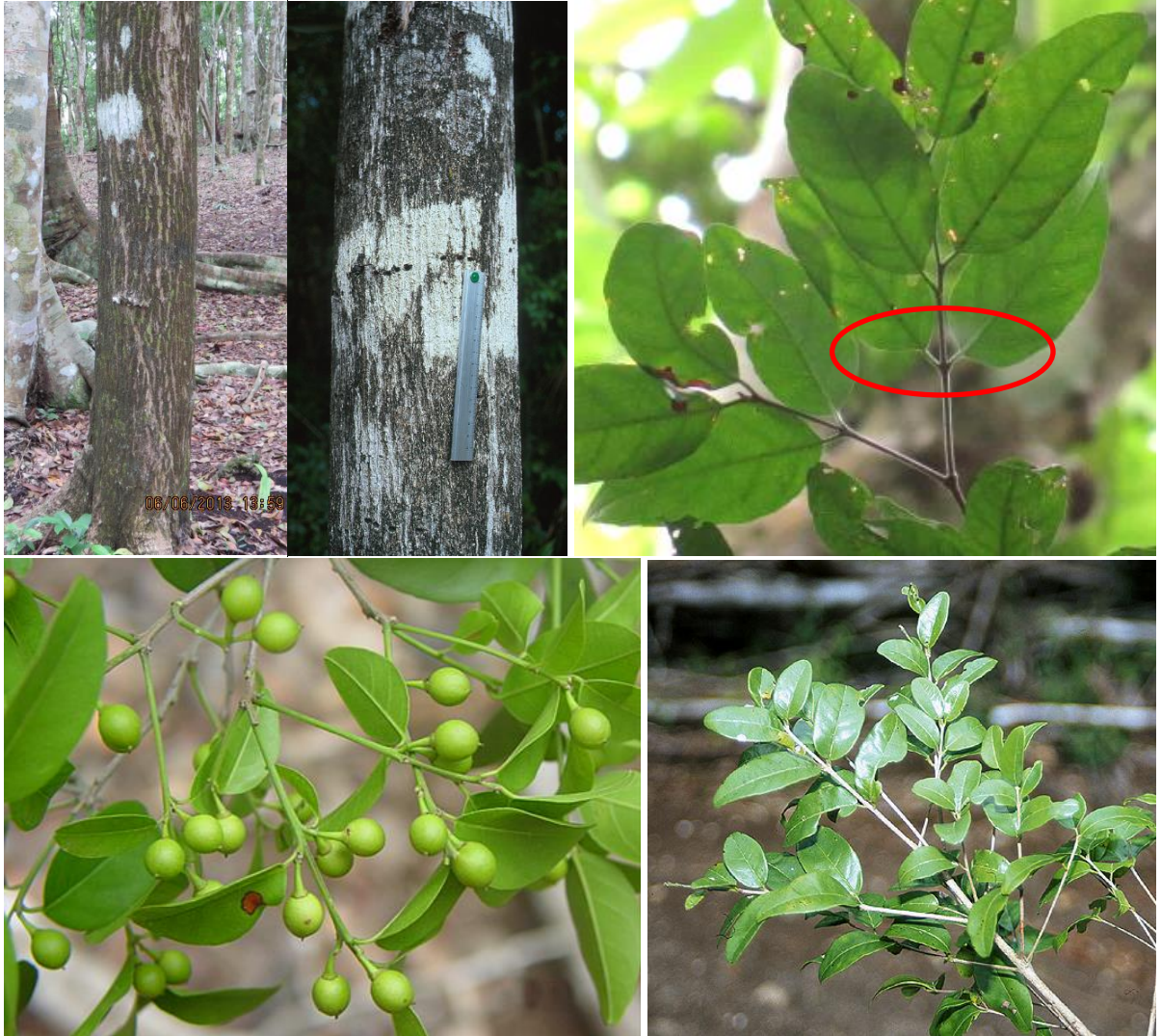
Flower: white, mostly in axillary cymes **Fruit:** berry, spicy clove odor

Ecology: dry upland forest; fruits collected for “allspice”; *Oc*

Similar species: *Miconia argentea* (p 89) has similar bark but different leaves.

Krugiodendron ferreum (Vahl) Urb. – axemaster, quebracho

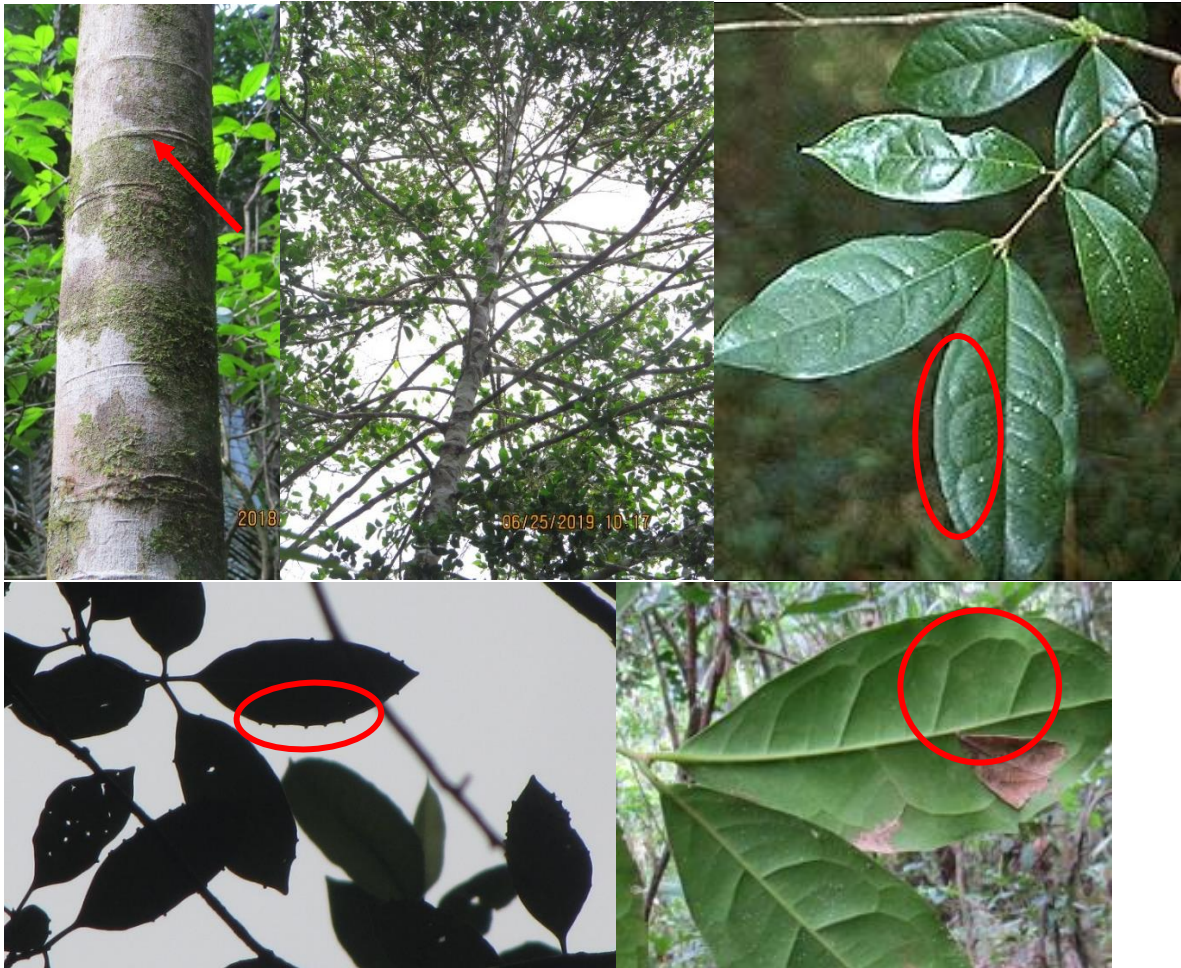
Rhamnaceae

**Key features:** leaf small and two-ranked, petiole short, base ~wedge-shaped**Form:** large **Bark:** shallowly fissured**Leaf:** small, two-ranked; petiole short; base ~wedge-shaped; may appear at first glance to be compound leaves**Flower:** axillary **Fruit:** drupe**Ecology:** dry upland forest; *Un***Similar species:** *Mouriri myrtilloides* (p 91) has obscure veins, ~no petiole; small-leaved Myrtaceae (p 93) generally have obscure veins; Rubiaceae (pp 97-101) usually have persistent stipules; *Melicoccus oliviformis* (p 132) has a compound leaf.

B, P, B, -, T

Cassipourea guianensis Aubl. – water wood

Rhizophoraceae



Key features: leaf bullate, margin often with conspicuous teeth, conspicuous connecting vein

Form: medium; monopodial (dominant central trunk); branches thin, radating **Bark:** gray; smooth or fissured, trunk-encircling rings

Leaf: petiole short, longer on leaves higher in tree; interpetiolar stipule scar; blade bullate, margin often with a few conspicuous teeth; conspicuous connecting vein

Flower: white, in axillary fascicles **Fruit:** berry, greenish, ellipsoid, in a “cup”

Ecology: riparian (mainly) and moist upland forest; *Co*

Similar species: Rubiaceae (pp 97-101) leaves are not toothed and lack conspicuous connecting vein. *Rinorea hummellii* (p 102) is a shrub or small tree with weak teeth and a non-bullate leaf. *Semialarium mexicanum* (Celastraceae, photo p 102, ng) has weak teeth and non-bullate leaf.

Alibertia edulis (Rich.) A. Rich. – wild guava

Rubiaceae



Key features: small tree; interpetiolar stipules pointed, reddish, persistent; wet areas

Form: small **Bark:** tan, small ridges

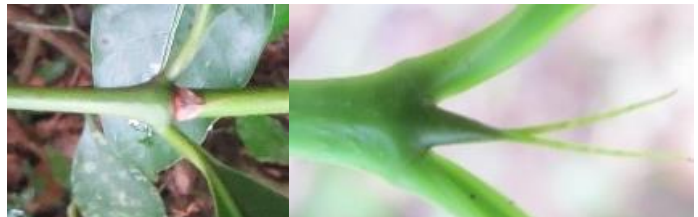
Leaf: interpetiolar stipules pointed, reddish-brown (persistent interpetiolar stipules are characteristic of Rubiaceae); blade elliptic; veins obscure

Flower: at tip of twig **Fruit:** at tip of twig, spherical, 3-4 cm diameter

Ecology: riparian forest, other wet places; *Oc*

Similar species: The pointed, brown, interpetiolar stipules are distinctive among simple opposite-leaf trees in the area. *Ouratea lucens* (p 71) has similar stipule but alternate leaves; Myrtaceae (p 92-94) lack interpetiolar stipules;

Faramea occidentalis (right, ng; common at Hill Bank, east of La Milpa) has light tan, persistent stipules, “snake tongue” terminal stipules, and large leaves with conspicuous veins.



Faramea occidentalis, stipules

Cosmocalyx spectabilis Standl. – (ni)

Rubiaceae



Key features: petiole long; leaf large, tapered to base, margins wavy

Form: large **Bark:** linear or irregular scales

Leaf: large; opposite and clustered; petiole long; blade tapered to base, margins wavy

Flower: (photo) **Fruit:** (ni)

Ecology: upland forest; *Un*

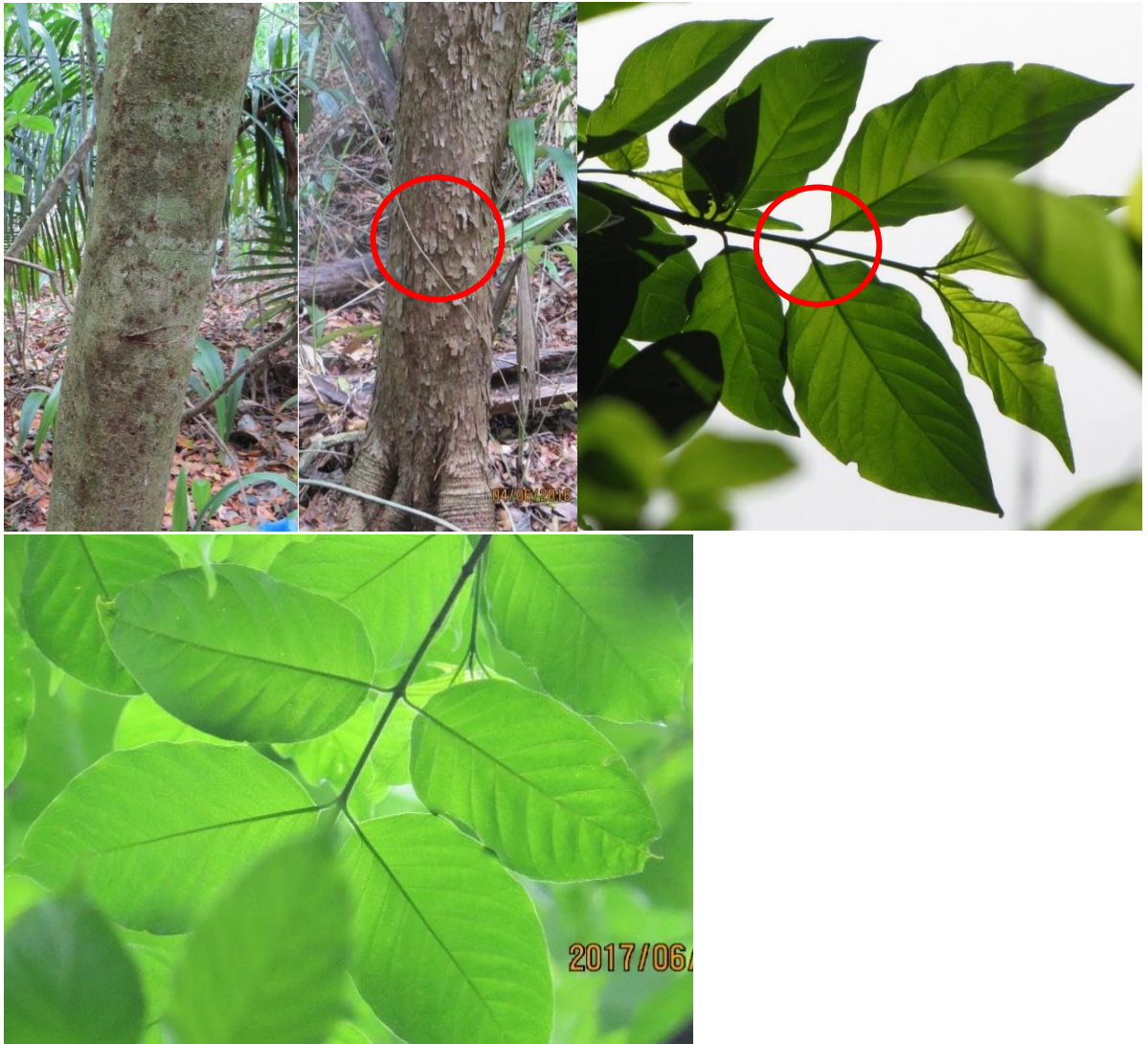
Similar species: *Alseis hondurensis* (p 81) has a different leaf and tan, ridged bark; *Exostema mexicanum* (p 99) has two-ranked leaves; *Guettarda combsii* (p 100) leaves are round to cordate at base; *Aegiphila monstrosa* (Lamiaceae, right, ng) is a small tree in open areas and lacks interpetiolar stipules and strongly tapered leaf base.

Aegiphila monstrosa



Exostema mexicanum A. Gray – sabac-ché

Rubiaceae



Key features: bark scaly, leaves two-ranked and broad

Form: medium **Bark:** light brown; smooth, becoming scaly

Leaf: two-ranked; blade broad, tip sometimes pointed, margins wavy

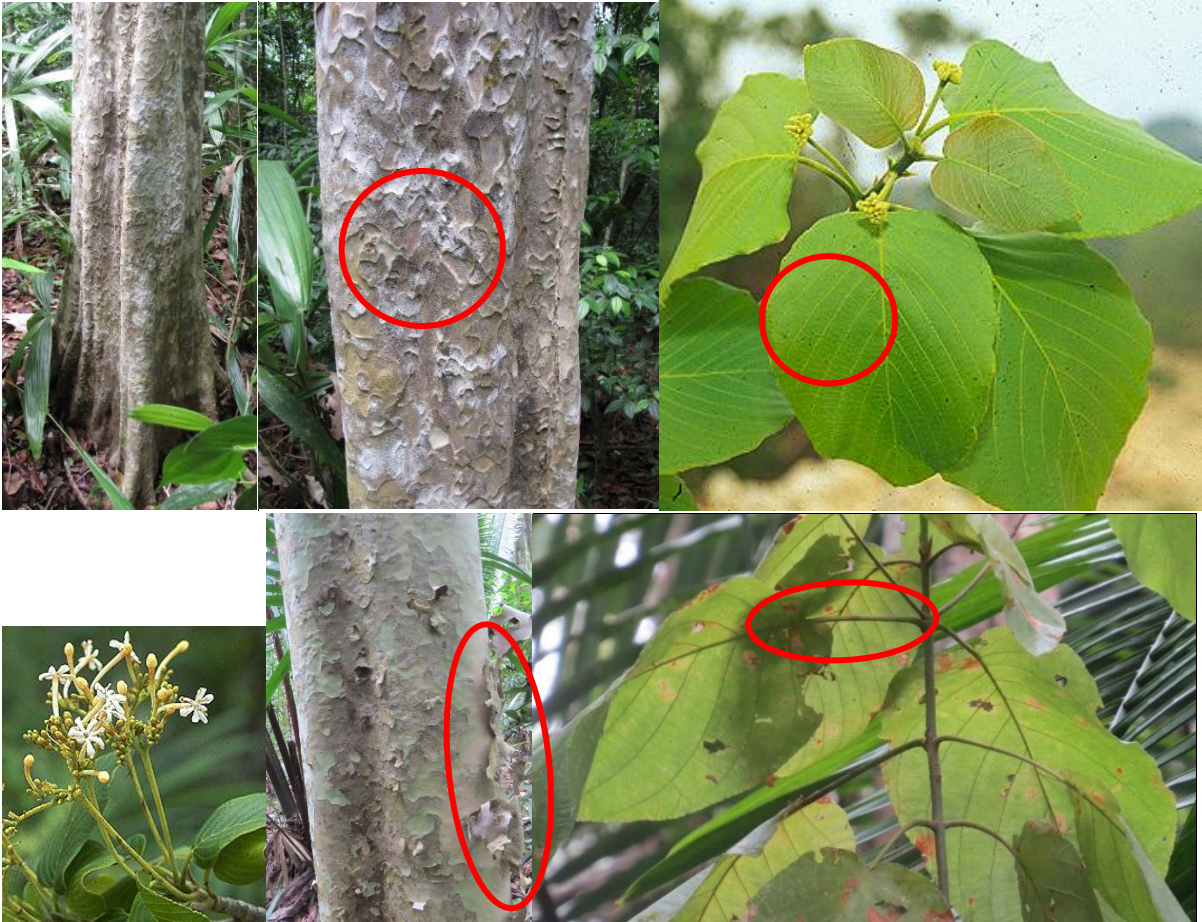
Flower: in panicles **Fruit:** capsule

Ecology: moist upland forest; *Oc*

Similar species: *Cosmocalyx spectabilis* (p 98) has long petioles, clustered leaves, and long-tapered leaf bases; *Guettarda combsii* (p 100) has longer petioles and rounder leaf; leaves of *Amaioua corymbosa* (ng) are silky pubescent below.

Guettarda combsii Urb. – glassy wood

Rubiaceae



Key features: bark pocked, hard; petiole long, blade broad, secondary veins conspicuous

Form: medium; trunk sometimes shallowly channeled **Bark:** light-colored, sometimes with green patches; surface pocked, hard, sometimes with detaching scales

Leaf: large; petiole long; blade broad, base ~cordate; secondary veins conspicuous and parallel

Flower: (photo) **Fruit:** drupe

Ecology: edges, gaps, secondary forest, occasional in bajos; *Co*

Similar species: *Alseis hondurensis* (p 81) and *Cosmocalyx spectabilis* (p 98) have tapered leaf bases; *Exostema mexicanum* (p 99) has short petioles and two-ranked leaves; *Astronium graveolens* (p 103) has similar bark but a compound leaf; *Amaioua corymbosa* (ng) has shorter petioles and leaves silky pubescent below.

Simira salvadorensis (Standl.) Steyerem. – john crow redwood Rubiaceae



Key features: bark orangeish, cut root or branch turns red, leaf base cordate, spike-like terminal bud

Form: large **Bark:** orangeish hue; fissured and slightly scaly; when cut or scraped, surface beneath bark is first yellowish, turning red

Leaf: petiole short; blade base obtuse to narrowly cordate, tip acuminate; prominent, spike-like bud at twig ends, visible from a distance

Flower: greenish, in terminal panicles **Fruit:** capsule; seed winged

Ecology: dry and moist (mainly) upland forest; *Oc*

Similar species: Moraceae (pp 36-43) have spike-like terminal buds, but have alternate leaves; *Ficus costaricana* (p 36) has large cordate leaves but is a strangler, with leaves alternate.

Rinorea hummellii Sprague – wild coffee

Violaceae



Key features: small tree; petioles curved, terminal pair form a “U”; blade shallowly toothed

Form: shrub or small tree; older trunks with rumpled surface **Bark:** smooth

Leaf: petioles curved, the terminal pair forming a “U” (becomes distinctive with viewer experience); stipules briefly persistent; blade shallowly toothed

Flower: in panicles **Fruit:** capsule, a few often present year-round

Ecology: riparian and upland forests; *Ab*

Similar species: Terminal petioles of *Calyptanthes chytraculia* (p 92) form somewhat of a “U”, but its leaves are pubescent and not toothed; Myrtaceae (pp 93, 94) are not toothed; *Cassipourea guianensis* (p 96) is a larger tree, with bullate leaves; Rubiaceae (pp 97-101) usually have a persistent stipule and lack toothed leaves; *Semialarium mexicanum* (Celastraceae, right, ng) is a larger tree, in more open forest (thin canopy).

*Semialarium mexicanum*

5 COMPOUND-PINNATE ALTERNATE LEAVES

Astronium graveolens Jacq. – jobillo, glassy wood

Anacardiaceae



Key features: bark pocked, leaflet toothed

Form: large **Bark:** light-colored; scaly, pocked

Leaf: odd-pinnate; leaflets opposite or subopposite, usually toothed (hard to see on large trees), in upper canopy margins appear curled downwards; dead leaves often present on tree

Flower: yellowish-green, in panicles **Fruit:** ellipsoid, opens as five-winged seed

Ecology: in all forests but bajo; *Oc*

Similar species: Other pinnate species with toothed leaflets: *Vatairea lundellii* (p 120) has alternate leaflets; *Allophylus cominia* (p 128) and *Thouinia paucidentata* (p 133) are trifoliate; *Cupania* spp. (pp 130, 131) have a leaf tip “bud”; *Turpinia occidentalis* (Staphyleaceae, ng) has opposite leaves.

Metopium brownei (Jacq.) Urb. – poison wood, chechem Anacardiaceae



Key features: bark with black patches; petiole and petiolules long; leaflet broad, with wavy margins and often black spots

Form: large **Bark:** gray, with black patches and streaks of black sap; scaly

Leaf: in spherical clumps at branch ends; odd-pinnate; petiole and petiolules long; leaflets usually 5, broad, margins wavy, spaced far apart, surface often with black spots; deciduous

Flower: greenish-yellow, in terminal panicles **Fruit:** berry, red, in hanging bunches

Ecology: edges, dry upland forest, transition forest, bajos; Co

Similar species: *Bursera simaruba* (p 107) has peeling, reddish bark; *Protium copal* (p 108) has smooth-scaly bark, petiolules swollen at both ends, and more conspicuous venation; *Trichilia pallida* (p 126) has a large terminal leaflet and parallel secondary veins. *Hirtella racemosa* (p 21) may have bark with black spots, but it has a simple leaf.

Spondias mombin L. – hog plum

Anacardiaceae



Key features: bark warty, leaves clustered at twig ends, leaflet asymmetric at base

Form: large **Bark:** tan; warty, especially at base of tree

Leaf: odd-pinnate, clustered at twig ends; leaflets opposite to subopposite, curved in plane of blade, with asymmetric bases, tips long-pointed; deciduous, new leaves yellow

Flower: white, in terminal panicles **Fruit:** fruit oblong, green

Ecology: edges, gaps, secondary forest; *Co*

Similar species: *S. radlkoferi* (p 106) has smoother bark and leaflets broader, less curved;

Lonchocarpus luteomaculatus (p 114) has fewer, larger leaflets; pinnate Fabaceae (pp 109-120) have swollen, cylindrical petiole bases and petiolules; *Cedrela odorata* (p 121) and *Swietenia macrophylla* (p 123) have ridged bark and leaves usually even-pinnate; *Cupania* spp. (pp 130, 131) have alternate, toothed leaflets.

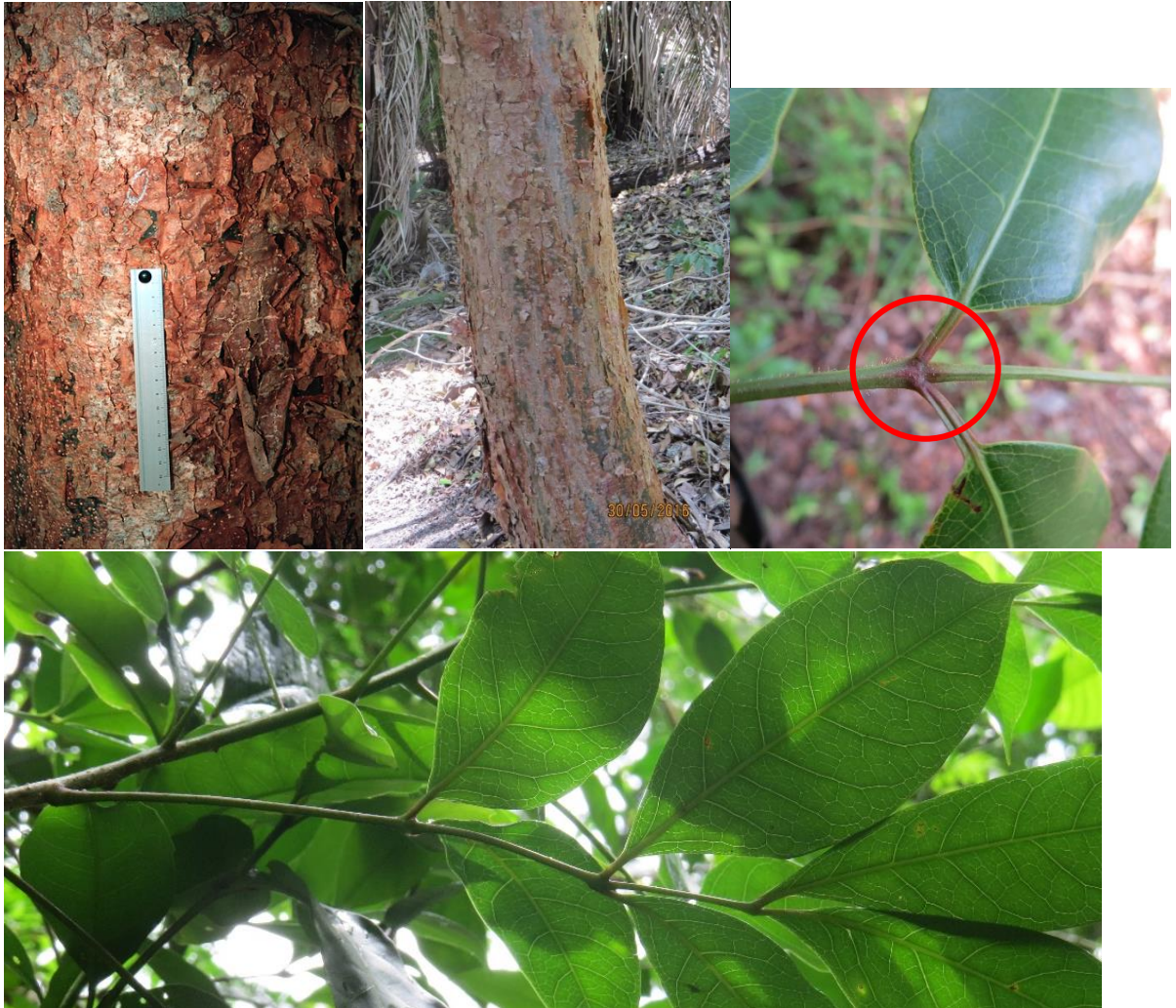
B, B, B, B (new leaves)

Spondias radlkoferi Donn. Sm. – jobo, hog plum

Anacardiaceae

**Key features:** leaves clustered at twig ends, leaflet asymmetric at base**Form:** large **Bark:** slightly fissured**Leaf:** odd-pinnate, clustered at twig ends; leaflets opposite to subopposite, asymmetric, with asymmetric bases, tips pointed; secondary veins translucent**Flower:** white, in terminal panicles **Fruit:** fruits oblong, orange**Ecology:** upland, transition, and secondary forest; *Co***Similar species:** *S. mombin* (p 105) has light tan, warty bark, and leaflets narrower, more curved; *Lonchocarpus luteomaculatus* (p 114) has fewer, larger leaflets; pinnate Fabaceae (pp 109-120) have swollen, cylindrical petiole and petiolule bases; *Cedrela odorata* (p 121) and *Swietenia macrophylla* (p 123) have ridged bark and leaves usually even-pinnate; *Cupania* spp. (pp 130, 131) have alternate, toothed leaflets.

Bursera simaruba (L.) Sarg. – gombolimbo, indio desnudo Burseraceae



Key features: bark red and peeling, veins translucent, crushed leaflet smells of turpentine

Form: large **Bark:** shiny green-tan in small trees, becoming coppery-red; peeling, large scales; sap smells of turpentine

Leaf: odd-pinnate; petiole and node reddish; leaflet asymmetric, veins translucent, turpentine smell when crushed; deciduous

Flower: greenish or yellowish, in axillary racemes **Fruit:** berry, brown

Ecology: edges, secondary forest, dry sites in upland forest, occasional in bajos; *Co*

Similar species: *Trophis racemosa* (p 70) can have patches of peeling, red bark, but it has simple leaves; *Myrciaria* sp. (p 93) has simple leaves.

Protium copal (Schlect. & Cham.) Engl. – copal

Bursaceae



Key features: trunk sometimes divided at base, bark with exuded sap, petiolules swollen at both ends, crushed leaflet smells of turpentine

Form: medium to large; trunk often divided at base **Bark:** gray; smooth to scaly; sap milky, exuding from trunk, turpentine odor

Leaf: large, odd-pinnate; petiolules long, swollen at both ends (can be seen at a distance); leaflet large, asymmetric at base; secondary veins conspicuous; turpentine smell when crushed

Flower: yellow or white, in axillary panicles **Fruit:** (photo); in ~June husk evident on ground

Ecology: riparian and moist upland forest; resin used as incense by ancient Maya; Co

Similar species: *Metopium brownei* (p 104) has scaly bark with black patches; *Bursera simaruba* (p 107) has red, peeling bark; *Trichilia pallida* (p 126) has shorter petiolules; *Cupania* spp. (pp 130, 131) have alternate, toothed leaflets.

Haematoxylum campechianum L. – logwood, tinta

Fabaceae: Caesalpinioideae



Key features: trunk channeled; leaflet small, wedge-shaped, tip indented; bajos

Form: medium; trunk channeled, thick for tree height **Bark:** light gray, scaly

Leaf: even-pinnate; leaflet small, in 3-4 pairs, wedge- or heart-shaped, often with retuse (indented) tip; secondary veins fine, parallel; small spines at leaf nodes

Flower: (photo) **Fruit:** flat pod

Ecology: bajos; formerly important for dye; *Un*

Similar species: *Caesalpinia gaumeri* (p 138) has bipinnate leaves, with asymmetric leaflets, and is a large tree found in dry upland forest. Additional species with irregular trunks have simple leaves.

B, P, B, P (fruits)

Swartzia cubensis (Britt. & Rose) Standl. – bastard rosewood

Fabaceae: Caesalpinioideae



Key features: petiolules conspicuously thick, short, and dark; leaf rachis slightly winged

Form: large; often leaning **Bark:** gray-brown, scaly

Leaf: odd-pinnate; petiolule thick, short, and dark; rachis winged, giving “halo” effect when backlit; outer branches sometimes with conspicuous bumps and lacking leaves where flowers and fruits were attached

Flower: short racemes on branch parts lacking leaves **Fruit:** pod, yellowish, with curved point at one end; seed arillate

Ecology: all forest types but bajos; *Oc*

Similar species: *Inga sapindoides* (p 111) has a winged rachis, but leaflets are large, even-pinnate, with glands on the rachis; *Lonchocarpus* spp. (pp 114, 115) have fewer leaflets and lack winged rachis.

Inga sapindoides Willd. – bribri

Fabaceae: Mimosoideae



Key features: leaflet size increases toward leaf tip, rachis winged, gland between leaflet pairs

Form: medium **Bark:** lines of horizontally stretched lenticels

Leaf: large, even-pinnate; leaflet size generally increases toward leaf tip, rachis winged (having flanges of leaf blade on rachis), circular gland between leaflet pairs

Flower: “shaving brush” form **Fruit:** pod; seed in white pulp

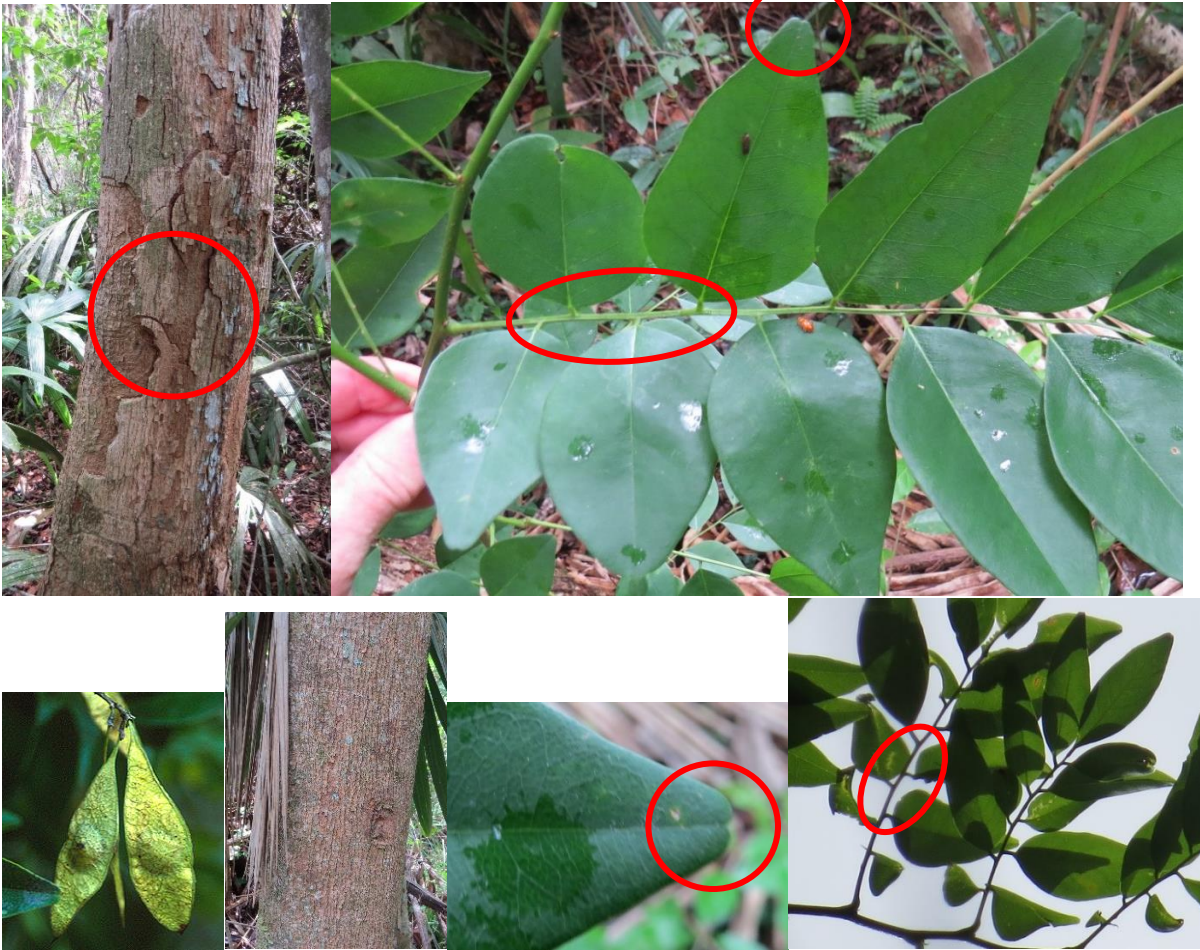
Ecology: riparian forest, pond edges; *Un*

Similar species: *Swartzia cubensis* (p 110) has narrow wings on its leaf rachis. Other species with similar, pinnate leaves lack the winged rachis.

Leptolobium panamense (Benth.) Sch. Rodr. & A.M.G. Azevedo

– billy webb

Fabaceae: Papilionoideae



Key features: bark orange, developing loose slabs; leaflets alternate, ovate, tip minutely indented

Form: large **Bark:** orangish; fissured, developing loose slabs of bark

Leaf: leaflets alternate or subopposite, shiny above, pale beneath, ovate (~outline of an egg), tip minutely retuse (indented); veins obscure

Flower: creamy white, in panicles **Fruit:** flat pod, pointed at both ends

Ecology: transition forest; *Un*

Similar species: Some other species with alternate leaflets: *Myroxylon balsamum* (p 116) has smooth bark and leaflets are not usually retuse; *Pterocarpus rohrii* (p 119) has large buttresses and larger leaflets; *Trichilia minutiflora* (p 125) has a small leaf; *Vatairea lundellii* (p 120) and *Cupania* spp. (pp 130, 131) have toothed leaflets.

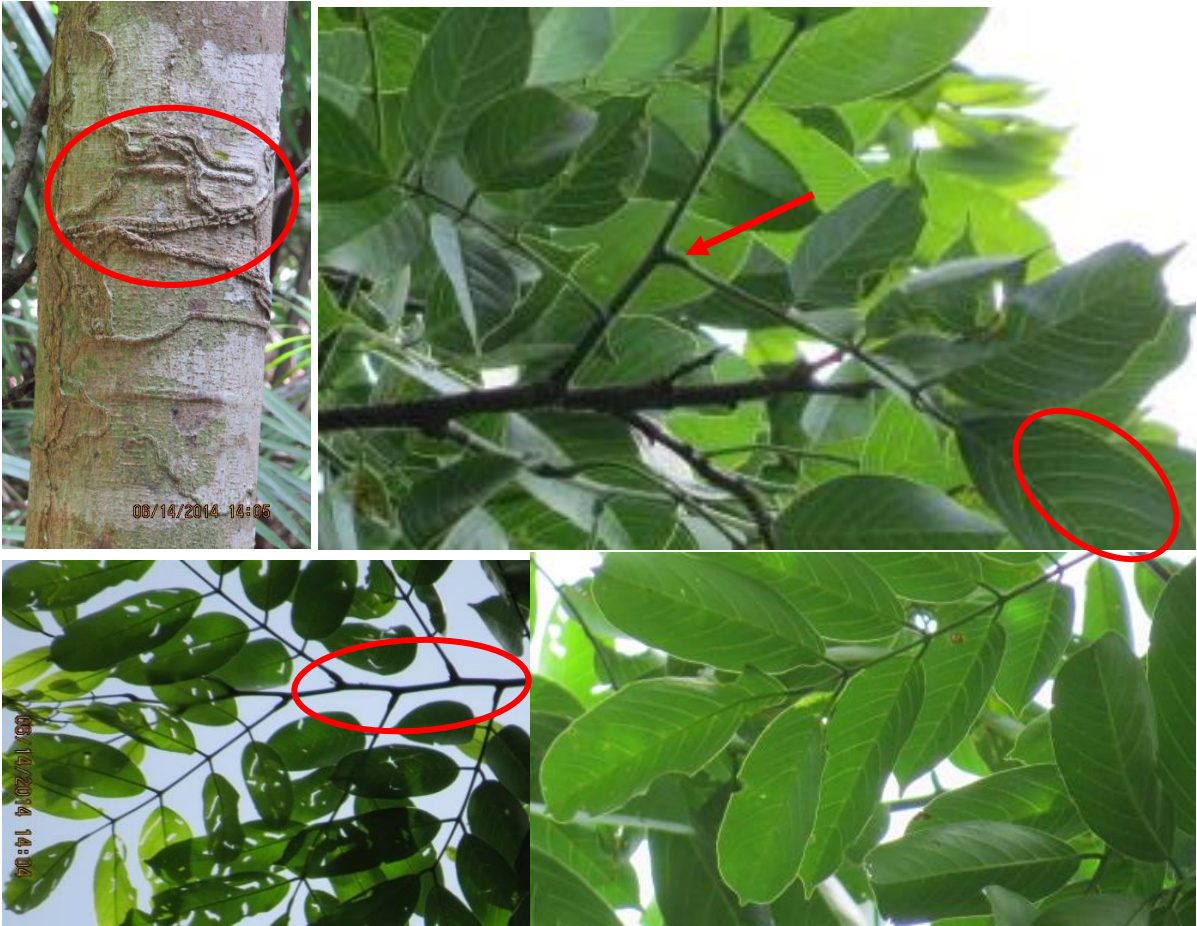
Lonchocarpus castilloi Standl. – black cabbage bark, manchiche

Fabaceae: Papilionoideae

**Key features:** trunk columnar, leaflet narrow**Form:** large; columnar **Bark:** gray; smooth, with a few scales**Leaf:** odd-pinnate; leaflet narrow; seedlings also with narrow leaflets**Flower:** purple, in panicles **Fruit:** flat pod**Ecology:** (ni); *Un***Similar species:** *L. castilloi* leaves are unique in the area.

Lonchocarpus cf. *luteomaculatus* Pittier – bitz

Fabaceae: Papilionoideae



Key features: bark with long “blisters”, leaves evenly-spaced along twigs, leaflet large, secondary veins conspicuous

Form: large **Bark:** light-colored; smooth, with winding, lenticillate “blisters”

Leaf: large, odd-pinnate; leaves evenly-spaced along twigs; pulvinus at petiole base thick and circular in cross-section (Fabaceae characteristic); leaflet acuminate; secondary veins yellow, parallel, conspicuous

Flower: often flowering when leafless **Fruit:** flat pod, narrow at both ends

Ecology: moist upland forest, wet areas; *Oc*

Similar species: *L. rugosus* (p 115) has smaller, oval, pubescent leaflets; *Metopium brownei* (p 104) has scaly bark and long petioles and petiolules; *Protium copal* (p 108) has smooth-scaly bark and petiolules swollen at both ends; *Trichilia pallida* (p 126) is a small tree with a large terminal leaflet; *Cupania* spp. (pp 130, 131) have alternate, toothed leaflets.

Lonchocarpus rugosus Benth. – black cabbage bark

Fabaceae: Papilionoideae

**Key features:** leaflet oval, light green, pubescent**Form:** medium **Bark:** (ni)**Leaf:** odd-pinnate; leaflet light green, oval, pubescent; venation prominent, thin and papery**Flower:** in panicle at branch ends **Fruit:** pod flat, except where thickened by seeds (Parker 2008)**Ecology:** transition forest; *Oc***Similar species:** *L. luteomaculatus* (p 114) leaflets are darker green and larger; *Cupania* spp. (pp 130, 131) have alternate, toothed leaflets; *Lennea melanocarpa* (right, ng) is a small tree, with smaller, oval, smooth leaflets.*Lennea melanocarpa*

Myroxylon balsamum (L.) Harms – balsam of Peru

Fabaceae: Papilionoideae



Key features: trunk columnar, bark orangeish, leaflets alternate

Form: large, trunk columnar **Bark:** orangeish; ~smooth, small scales; bark sometimes stripped

Leaf: leaflets usually alternate, tip sometimes retuse; veins obscure

Flower: whitish, in racemes **Fruit:** single-winged seed

Ecology: moist upland forest; bark prized as medicinal; *Un*

Similar species: Some other species with alternate leaflets: *Leptolobium panamense* (p 112) has different bark, and its leaflets are more ovate, with retuse tip more evident; *Pterocarpus rohrii* (p 119) has large buttresses and large leaflets; *Vatairea lundellii* (p 120) and *Cupania* spp. (pp 130, 131) have toothed leaflets; *Trichilia minutiflora* (p 125) has a small leaf.

Ormosia schippii Pierce ex Standl. & Steyer. – hormigo

Fabaceae: Papilionoideae



Key features: trunk columnar, bark with prominent lenticels, leaf large, secondary veins conspicuous

Form: large; columnar **Bark:** dense, prominent lenticels stretched horizontally

Leaf: large, odd-pinnate; pulvinus at petiole base large; leaflet large, green above, tan and densely pubescent beneath, leathery; secondary veins parallel, conspicuous

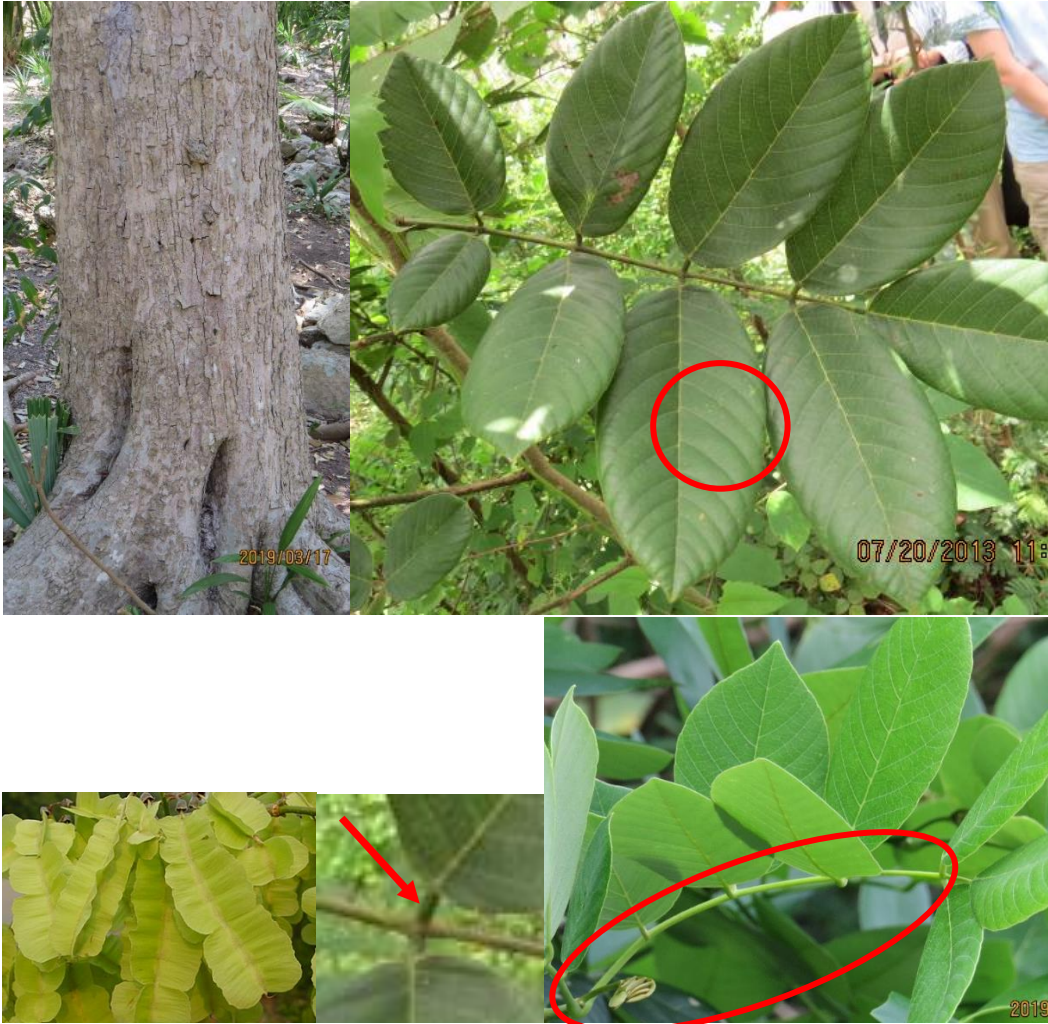
Flower: lavender, in large terminal panicle **Fruit:** pod; seed hard, shiny, red and black, conspicuous on ground

Ecology: moist upland forest; *Un*

Similar species. *Trophis racemosa* (p 70) has horizontally extended lenticels on its bark, but it has a simple leaf; *Inga sapindoides* (p 111) has horizontally extended lenticels, but its leaf has a winged rachis; *Lonchocarpus luteomaculatus* (p 114) has long, winding lenticels; *Piscidia piscipula* (p 118) has scaly bark.

Piscidia piscipula L. Sarg. – jabín, dogwood

Fabaceae: Papilionoideae



Key features: petiolules thick, leaf in sun has curved rachis and upturned leaflets, veins conspicuous, distinctive winged fruit

Form: large **Bark:** light tan, linear scales

Leaf: large, odd-pinnate; petiole pulvinus and petiolules noticeably thick and circular in cross section (Fabaceae characteristic); leaflet dull green, pointed, stiff; veins conspicuous; in sun-exposed leaves rachis is curved, leaflets upturned

Flower: in panicles **Fruit:** (photo) with distinctive wings

Ecology: edges, tops of some Maya temples; *Un*

Similar species: *Lonchocarpus luteomaculatus* (p 114) and *Ormosia schippii* (p 117) have horizontally-extended lenticels on their bark.

Pterocarpus rohrii Vahl – mountain kaway

Fabaceae: Papilionoideae



Key features: very large tree, buttresses large and thin, leaflets large and alternate

Form: very large; buttresses large, thin, with light-colored edges **Bark:** light tan-gray, fissured; sap red

Leaf: large; leaflets large, usually clearly alternate, droopy look in upper canopy

Flower: orange-yellow, in terminal racemes; flowers every other year **Fruit:** seed with circular wing

Ecology: riparian forest, moist upland forest; *Un*

Similar species: Some other species with alternate leaflets: *Leptolobium panamense* (p 112) has orangeish bark and smaller, retuse leaflets; *Myroxylon balsamum* (p 116) has smaller buttresses and smaller leaflets; *Vatairea lundellii* (p 120) and *Cupania* spp. (pp 130-131) have toothed leaflets.

Vatairea lundellii (Standl.) Killip – bitter wood, danto Fabaceae: Papilionoideae



Key features: trunk columnar, buttresses often chewed, leaf large, leaflets alternate and toothed

Form: large; columnar, buttressed **Bark:** dark gray to reddish-brown; smooth, with horizontal lines; bark on buttress edges often scarred

Leaf: large, odd-pinnate; leaflets alternate or subopposite, toothed, coarsely on saplings

Flower: purple, in large terminal panicles **Fruit:** seed large, single-winged

Ecology: moist upland forest on deep soil; buttresses likely chewed by wildlife (including tapirs) in famine years (common name “danto” = tapir); *Un*

Similar species: Other species with toothed leaflets: *Astronium graveolens* (p 103) has pocked bark and opposite leaflets; *Allophylus cominia* (p 128) and *Thouinia paucidentata* (p 133) are trifoliate; *Cupania* spp. (pp 130, 131) have a leaf tip “bud”; *Turpinia occidentalis* (Staphyleaceae, ng) has opposite leaves. Other species with alternate leaflets have leaflets without teeth; see pp 112, 116, 119, 125, 134.

Cedrela odorata L. – Spanish cedar, cedro

Meliaceae



Key features: very large tree, leaf large, even-pinnate; upper canopy leaflet curved; garlic odor

Form: very large; buttresses large **Bark:** light gray, becoming dark brown; becoming deeply fissured; sapling bark with garlic odor when crushed

Leaf: large; usually even-pinnate, clustered at twig tips; leaflets many, opposite (sometimes subopposite), curved in plane of blade in upper canopy; adults deciduous; leaf and twig with garlic odor when crushed

Flower: greenish-white, in panicles **Fruit:** capsule; seed small, single-winged

Ecology: moist upland forest; long-lived pioneer colonizing large open areas; *Un*

Similar species: *Swietenia macrophylla* (p 123) has fewer, larger leaflets; *Spondias* spp. (pp 105, 106) have different bark and odd-pinnate leaves; *Swartzia cubensis* (p 110) has a winged rachis; *Lonchocarpus luteomaculatus* (p 114) has smooth bark and fewer, larger leaflets.

Guarea glabra Vahl – cramantee, carbón

Meliaceae



Key features: even-pinnate, with ~3 pairs of leaflets, a “bud” conspicuous between terminal pair of leaflets

Form: medium **Bark:** tan; fissured, becoming scaly

Leaf: even-pinnate; ~3 pairs of leaflets; leaflets sometimes asymmetric, acuminate, a “bud” conspicuous between terminal pair

Flower: in panicles **Fruit:** capsule; seed in red aril

Ecology: moist upland forest, riparian forest; *Co*

Similar species: *G. grandifolia* (ng; occurs near Hill Bank, east of La Milpa) has a very large leaf. Other pinnate species with bud-like leaf tips: *Blomia prisca* (p 129) has a smaller “bud” and different trunk and bark; *Sapindus saponaria* (Sapindaceae, drawing p 129; ng) has more leaflets and sometimes a winged rachis; *Cupania* spp. (pp 130, 131) have alternate leaflets; *Melicoccus oliviformis* (p 132) has a smaller or absent “bud”.

Swietenia macrophylla King – mahogany, caoba

Meliaceae



Key features: very large tree, bark with white patches, leaf even-pinnate, leaflets curved in upper canopy

Form: very large; buttresses large **Bark:** dark brown with large white patches; ridged, developing fewer white patches and thick scales

Leaf: even-pinnate, clustered at twig tips; leaflet surface glossy above, elliptic, but in exposed, outer canopy curved in plane of blade, interior leaves less so; seedlings odd-pinnate

Flower: whitish, in axillary panicles **Fruit:** large capsule; seed large, single-winged

Ecology: all forest types, occasional in bajos; long-lived pioneer colonizing large open areas; highest value timber species in the area; *Oc*

Similar species: *Spondias* spp. (pp 105, 106) have different bark and more leaflets; *Lonchocarpus luteomaculatus* (p 114) has smooth bark and fewer, larger leaflets; *Cedrela odorata* (p 121) has more, but smaller, leaflets, and garlic smell. B, B, B (exposed), B (subcanopy), B (seedling), P, B (*S. mahagoni*, Puerto Rico)

Trichilia hirta L. – red cedar

Meliaceae



Key features: leaf very long, leaflets many and asymmetric at base; found on edges

Form: medium **Bark:** brown, lenticillate

Leaf: very long, odd-pinnate; leaflets many, markedly asymmetric at base

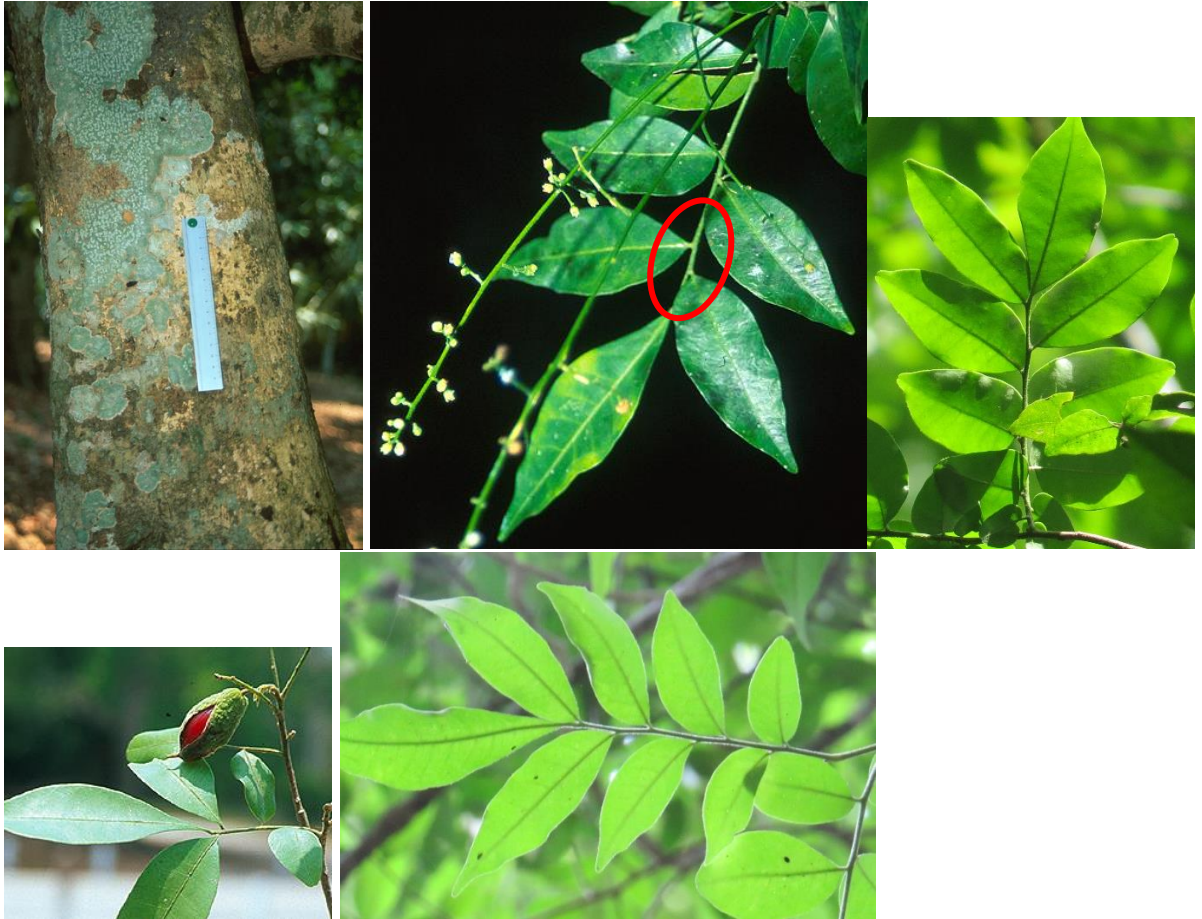
Flower: in axillary panicles **Fruit:** capsule; seed arillate

Ecology: secondary forest; *Un*

Similar species: *Spondias* spp. (pp 105, 106) have different bark and smaller leaves; *Cedrela odorata* (p 121) has ridged bark and larger leaflets and is even-pinnate; *Simarouba amara* (p 134) leaflets are contrastingly-colored above and below and have obscure veins; *Matayba oppositifolia* (p 137) has opposite leaves.

Trichilia minutiflora Standl. – wild lime

Meliaceae



Key features: leaf small, leaflets alternate or subopposite

Form: medium **Bark:** smooth

Leaf: small, even-pinnate but with terminal leaflet; leaflets alternate to subopposite

Flower: white, tiny, in panicles **Fruit:** capsule; seed arillate

Ecology: moist upland forest; *Ab*

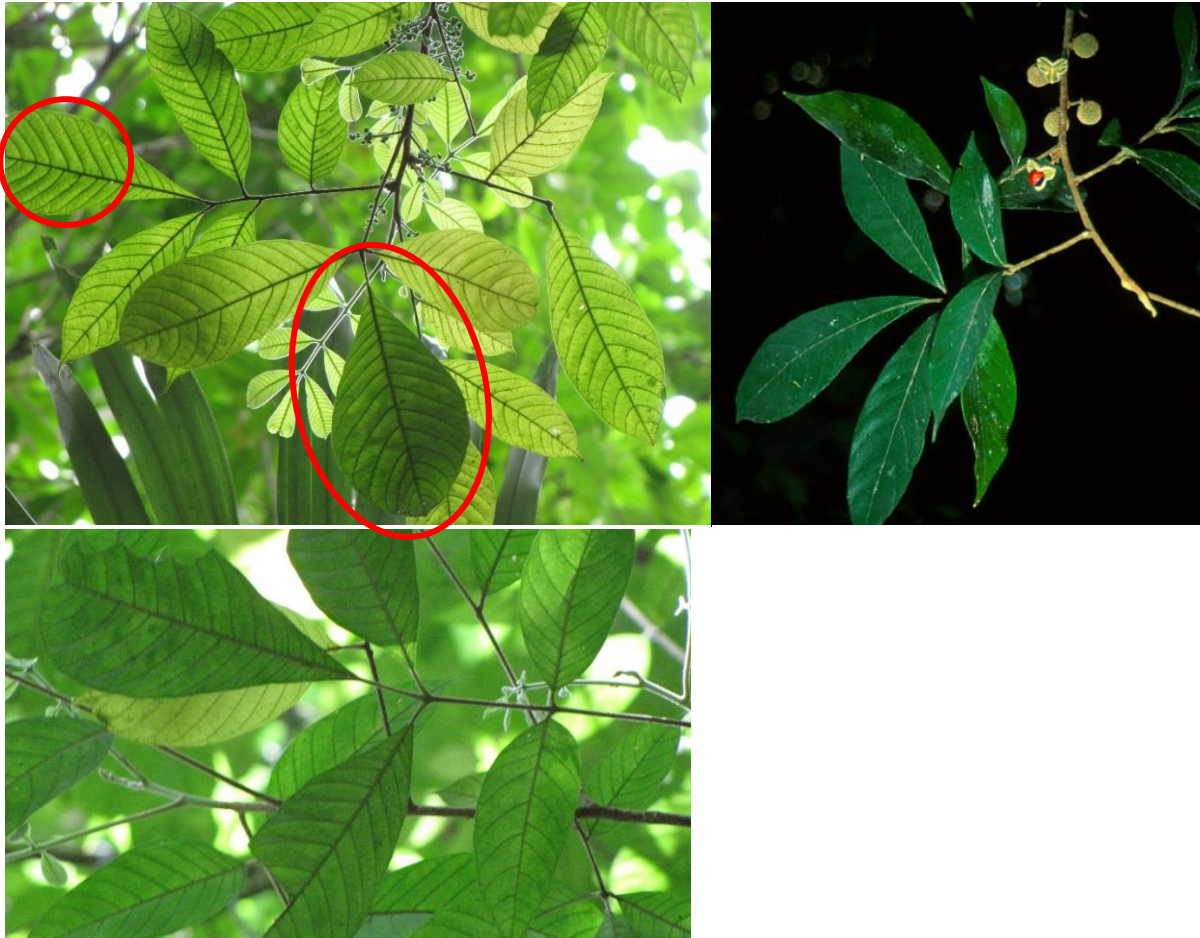
Similar species: Other species with alternate leaflets have larger leaves: *Leptolobium panamense* (p 112), *Pterocarpus rohrii* (p 119), *Simarouba amara* (p 134); or toothed leaflets: *Vatairea lundellii* (p 120), *Cupania* spp. (p 130, 131). *Dialium guianense* (Fabaceae, ng), with ~similar leaf, is a large tree, found to the south. *Picramnia antidesma* (Picramniaceae, right, ng) is a shrub or small tree.

P, P, B, B, P

*Picramnia antidesma*

Trichilia pallida Sw. – carbón del río

Meliaceae



Key features: small tree, terminal leaflet largest, secondary veins conspicuous

Form: small **Bark:** (ni)

Leaf: large, odd-pinnate; leaflets usually five, pairs increase in size from leaf base to tip, terminal leaflet largest and long-tapered to base; secondary veins parallel, conspicuous

Flower: pale yellow, in axillary panicles **Fruit:** capsule; seed arillate

Ecology: moist upland forest understory; *Ab*

Similar species: *T. minutiflora* (p 125) has a small leaf; *T. havanensis* (right, ng) has a terminal leaflet very long-tapered to base and less conspicuous venation; *Allophylus cominia* (p 128) and *Thouinia paucidentata* (p 133) are trifoliate, with toothed leaflets.

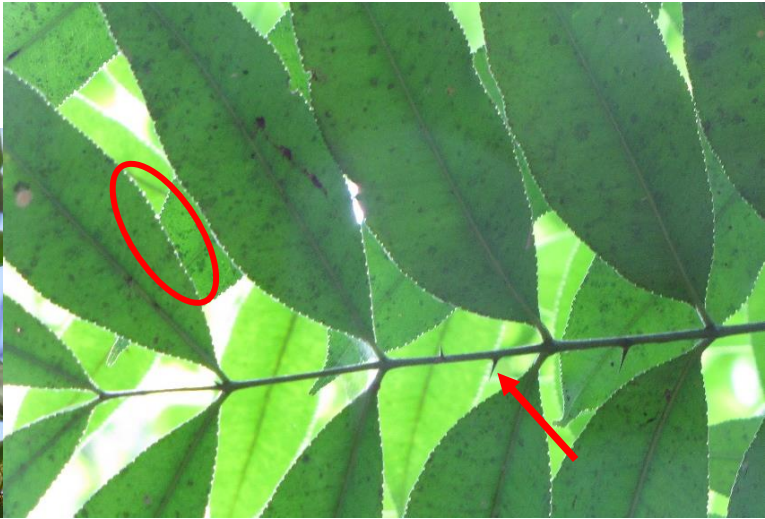
B, P, B

Trichilia havanensis



Zanthoxylum acuminatum Sw. (Sw.) – black prickly yellow

Rutaceae



Key features: trunk, branches, and twigs with conical prickles; leaflet margins with light dots when backlit

Form: large **Bark:** smooth, with small, conical, becoming flat, prickles

Leaf: even- or odd-pinnate, clustered at twig ends; leaflets mostly opposite, margins dotted with glands visible as gold fringe when backlit; midvein sometimes with prickles; lemon smell when crushed; branches and twigs with sparse prickles

Flower: white or yellowish-white, in panicles **Fruit:** green capsule; black seed

Ecology: upland forest, secondary forest; *Oc*

Similar species: *Z. ekmanii* (right, ng) has much larger leaves and conspicuous trunk prickles; *Z. caribaeum* (ng) has roundish leaflets with indentations on the margins.



Zanthoxylum ekmanii

Allophylus cominia (L.) Sw. – cherry, huesillo

Sapindaceae



Key features: trifoliate, leaflet toothed; found on edges

Form: medium **Bark:** smooth and scaly

Leaf: trifoliate; leaflet thin, toothed

Flower: white, in racemes **Fruit:** seed arillate

Ecology: edges, secondary forest; *Co*

Similar species: *Trichilia pallida* (p 126) has usually 5 leaflets; *Thouinia paucidentata* (p 133) has a channeled trunk and leaves with bigger teeth; *Amyris elemifera* (p 136) has opposite and entire (not toothed) leaves; *Forchammeria trifoliata* (Capparaceae, ng) is a small tree with large, dark green, stiff, trifoliate leaves on long petioles; *Jacaratia dolichaula* (Caricaceae, right, ng) has fleshy, entire leaves and swollen trunk base.

B, B, B, P



Jacaratia dolichaula

Blomia prisca (Standl.) Lundell – tzol

Sapindaceae



Key features: trunk channeled, leaf even-pinnate, leaflets subopposite, spike at rachis tip

Form: large; trunk of larger trees channeled **Bark:** gray-brown, scaly

Leaf: even-pinnate; leaflets mostly subopposite, inconspicuous bud-like spike (mucro) between terminal pair of leaflets; new leaf pinkish

Flower: in axillary panicles **Fruit:** capsule **Ecology:** dry (mainly) and moist upland forest; *Oc*

Similar species: Pinnate species with leaf tip “buds”: *Guarea glabra* (p 122) has a larger “bud” and different trunk and bark; *Cupania* spp. (pp 130, 131) have alternate leaflets; *Melicoccus oliviformis* (p 132) has a smaller “bud”; *Sapindus saponaria* (right, ng) has larger leaflets and may have a winged rachis; *Cedrela odorata* (p 121) and *Swietenia macrophylla* (p 123) are larger trees, with ridged bark, more leaflets, and sometimes a terminal “bud”.

Sapindus saponaria



Cupania belizensis Standl. – grande betty

Sapindaceae



Key features: leaflets alternate and toothed, “bud” opposite terminal leaflet

Form: medium **Bark:** smooth, lenticellate

Leaf: leaflets alternate, toothed; small “bud” opposite terminal leaflet; secondary veins prominent

Flower: whitish, in racemes or panicles **Fruit:** capsule; seed arillate

Ecology: moist upland forest, edges; *Oc*

Similar species: *C. rufescens* (p 131) has a larger, rusty-pubescent leaf; *Vatairea lundellii* (p 120) has alternate toothed leaflets but is a large tree and lacks a leaf tip “bud”. Other species with a leaf tip “bud”: *Guarea glabra* (p 122) has opposite, entire leaflets; *Blomia prisca* (p 129) and *Melicoccus oliviformis* (p 132) have subopposite, entire leaflets. Other species with alternate leaflets have entire leaflets: *Leptolobium panamense* (p 112), *Myroxylon balsamum* (p 116), *Pterocarpus rohrii* (p 119), *Trichilia minutiflora* (p 125), and *Simarouba amara* (p 134).

Cupania rufescens Triana & Planch. – white grande betty Sapindaceae



Key features: leaf large, leaflets alternate and toothed, veins conspicuous, rachis pubescent, small “bud” opposite terminal leaflet

Form: medium **Bark:** (ni)

Leaf: large; leaflets large, alternate, bullate, toothed; small “bud” opposite terminal leaflet; veins conspicuous; rachis and new leaf brown pubescent

Flower: in panicles **Fruit:** capsule; seed arillate

Ecology: edges; *Un*

Similar species: *C. belizensis* (p 130) has a smaller leaf with less pubescence; *Vatairea lundellii* (p 120) has alternate toothed leaflets but is a large tree and lacks a leaf tip “bud”. Other species with a leaf tip “bud”: *Guarea glabra* (p 122) has opposite, entire leaflets; *Blomia prisca* (p 129) and *Melicoccus oliviformis* (p 132) have subopposite, entire leaflets. Other species with alternate leaflets have entire leaflets: *Leptolobium panamense* (p 112), *Myroxylon balsamum* (p 116), *Pterocarpus rohrii* (p 119), *Trichilia minutiflora* (p 125), and *Simarouba amara* (p 134).

Melicoccus oliviformis Kunth – kinep, guaya

Sapindaceae



Key features: even-pinnate (hard to determine); leaflets in two pairs

Form: large; buttresses small **Bark:** gray, smooth

Leaf: even-pinnate (but hard to see that leaf is compound); leaflets opposite, in two pairs (sometimes missing a pair); inconspicuous bud-like spike (mucro) usually between terminal pair of leaflets; new leaves olive color, old leaves often with brown spots

Flower: in short panicles **Fruit:** drupe

Ecology: dry (mainly) and moist upland forest; often on Maya ruins; *Oc*

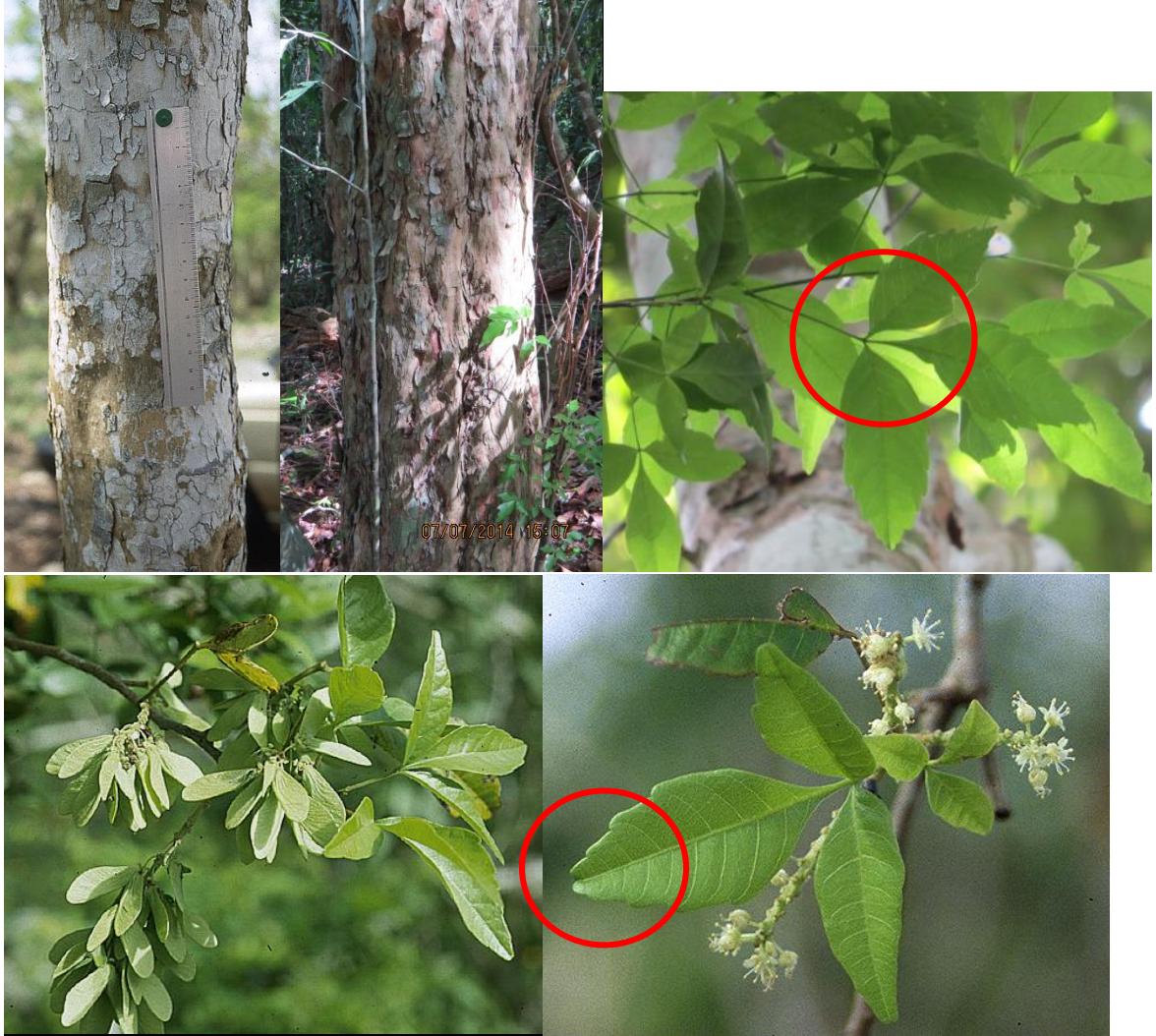
Similar species: *Talisia floresii* (ng) has a similar but larger leaf and is in transition forest; Myrtaceae (pp 92-94) have simple leaves; *Krugiodendron ferreum* (p 95) has simple leaves; *Guarea glabra* (p 122) has larger leaves; *Trichilia minutiflora* (p 125) has alternate leaflets; *Exothea diphylla* (right, ng) has one pair of leaflets.



Exothea diphylla (Mexico)

Thouinia paucidentata Radkl. – dzol

Sapindaceae



Key features: trunk shallowly channeled, leaf trifoliate, leaflet toothed, dry hillsides and hill tops

Form: medium; trunk becoming channeled **Bark:** scaly

Leaf: trifoliate; leaflet coarsely toothed toward tip

Flower: (photo) **Fruit:** seeds paired, each single-winged

Ecology: dry upland forest on upper hillsides and hill tops; Co

Similar species: Other trifoliate species: *Allophylus cominia* (p 128) is a small tree found on edges and leaves not so coarsely toothed; *Amyris elemifera* (p 136) has opposite leaves, entire leaflets; *Jacaratia dolichaula* (photo p 128, ng) has fleshy, entire leaves; *Forchammeria trifoliata* (Capparaceae, ng) is a shrub or small tree with large, dark green, stiff, trifoliate leaves and long petioles and leaflets.

P, B, B, P, P

Simarouba amara Aubl. – negrito

Simaroubaceae



Key features: leaf large; leaflets alternate, base asymmetric, pale green below; veins obscure

Form: large, columnar **Bark:** yellowish-gray, fissured

Leaf: clustered at twig ends; petiolules short; leaflets alternate, shiny above, pale below, base asymmetric, tip rounded to pointed, margins curled inward; midvein prominent, other veins obscure

Flower: white, in large terminal panicles **Fruit:** berry, black or purple

Ecology: upland forest; *Oc*

Similar species: *Trichilia hirta* (p 124) bark is reddish; its leaflets are more pointed, have more conspicuous veins, and lack top-bottom surface contrast. Some other species with alternate leaflets: *Vatairea lundellii* (p 120) and *Cupania* spp. (pp 130, 131) have toothed leaflets; *Leptolobium panamense* (p 112) has few, retuse leaflets; *Myroxylon balsamum* (p 116) has few, rounder leaflets; *Pterocarpus rohrii* (p 119) has large buttresses and few, large leaflets. *Matayba oppositifolia* (p 137) has opposite leaves.

6 COMPOUND-PINNATE OPPOSITE LEAVES

Note: *Zygia* sp. (p 147) may appear to be compound-pinnate but is compound-bipinnate.

Platymiscium yucatanum Standl. – granadillo

Fabaceae-Papilionoideae



Key features: bark ridged; leaf nodes conspicuous, petiole and petiolules long; small branches and twigs conspicuously opposite

Form: large **Bark:** fissured, becoming scaly

Leaf: odd-pinnate; petiole and petiolules long; leaflets usually 5, pairs well separated; deciduous; leaf node conspicuous; small branches and twigs conspicuously opposite

Flower: yellow, in racemes on leafless twigs **Fruit:** pod thin, oval, forming a wing on single seed

Ecology: (ni); *Un*

Similar species: *Matayba oppositifolia* (p 137) has different bark, and many leaflets; *Turpinia occidentalis* (Staphyleaceae, ng) leaflets are toothed.

Amyris elemifera L. – waika pine

Rutaceae



Key features: leaflets usually three, citrus odor when crushed

Form: small to medium **Bark:** fissured to scaly

Leaf: leaflets 3, sometimes 4, broad; citrus odor when crushed

Flower: in panicles **Fruit:** berry

Ecology: transition forest, bajos, wet areas; *Oc*

Similar species: *Allophylus cominia* (p 128) and *Thouinia paucidentata* (p 133) have alternate leaves with toothed leaflets; *Jacaratia dolichaula* (Caricaceae, photo p 128, ng) has alternate, fleshy leaves; *Forchammeria trifoliata* (Capparaceae, ng) is an understory plant with large, stiff, dark green trifoliate leaves. With its short petiolules, some trifoliate leaves of *A. elemifera* may appear to be compound-palmate; compare with species on pages 152, 153.

Matayba oppositifolia (A. Rich) Britton – boyjob

Sapindaceae



Key features: bark with light and dark bands, leaves subopposite, leaflets opposite or subopposite

Form: large **Bark:** broad light and dark bands, smooth

Leaf: leaves subopposite (not quite opposite); leaflets opposite or subopposite, pointed, stiff

Flower: greenish or whitish, in large panicles **Fruit:** capsule, heart-shaped; black seed

Ecology: transition forest; Co

Similar species: *Trichilia hirta* (p 124) and *Simarouba amara* (p 134) have alternate leaves; *Turpinia occidentalis* (Staphyleaceae, ng) has toothed leaflets.

7 COMPOUND-BIPINNATE LEAVES

Caesalpinia gaumeri Greenm. – waree wood Fabaceae-Caesalpinioideae



Key features: trunk strongly channeled; pinnules large, asymmetric

Form: large; trunk strongly channeled **Bark:** reddish brown, scaly

Leaf: pinnules (subdivision of leaflet) alternate or opposite, large, asymmetric

Flower: (photo) **Fruit:** (photo)

Ecology: dry upland forest; *Oc*

Similar species: Other bipinnate species have much smaller pinnules, except *Cojoba graciliflora* (p 141), which is a small tree and has glands on its leaf rachises, and *Zygia* sp. (p 147), which has much bigger pinnules. Also with channeled trunks, *Haematoxylum campechianum* (p 109) and *Thouinia paucidentata* (p 133) have pinnate, not bipinnate, leaves. Additional species with irregular trunks have simple leaves.

Schizolobium parahyba (Vell.) Blake – quamwood

Fabaceae: Caesalpinioideae



Key features: very large tree, buttresses large, bark smooth and orangeish, leaf very large
Form: very large; columnar, thin curving buttresses; on sapling trees the cluster of large bipinnate leaves makes it resemble a tree fern
Bark: orangeish on lower trunk, whitish above; smooth, with fine fissures and lenticels; small sapling stems sticky
Leaf: very large, clustered at branch ends; petiole sticky; deciduous
Flower: yellow, in racemes; flowers after leaf fall
Fruit: pod, brown, comprising one single-winged seed
Ecology: edges; *Un*
Similar species: No other species in the area has such a large bipinnate leaf. Sapling *S. parahyba* have been mistaken for tree ferns.

B, B, B (sapling, ~3 m tall), P, T

Cojoba arborea (L.) Britt. & Rose – barba jolote, wild tamarind

Fabaceae: Mimosoideae



Key features: very large tree, buttresses large, leaves finely bipinnate, pod red

Form: very large; buttresses large, canopy much branched **Bark:** light gray brown, becoming yellowish or orangeish; fissured, becoming scaly

Leaf: large; pinnules small, many, asymmetric; glands at base of rachis and between leaflet pairs

Flower: greenish white, in long-stalked, spherical heads **Fruit:** mature pod red, coiled; seed black

Ecology: moist upland forest; *Oc*

Similar species: *C. graciliflora* (p 141) has similar fruit but is a small tree; *Havardia albicans* (p 142) has smooth bark and prominent prickles; *Lysiloma latisiliquum* (p 143) has bark with large rectangular scales; *Mariosousa usumacintensis* (p 144) has scaly reddish bark; *Senegalia glomerosa* (p 145) has smooth, light bark, with prickles.

Cojoba graciliflora (S.F. Blake Britton & Rose) – john crow bead

Fabaceae: Mimosoideae



Key features: small tree; leaf large, pinnules asymmetric, glands on rachis

Form: small, 1.5-3 m **Bark:** (ni)

Leaf: large; pinnules asymmetric at base; glands on rachis and at leaf and leaflet bases (note: top left photo shows one leaf)

Flower: in axillary panicles **Fruit:** mature pod red, coiled; seed black

Ecology: moist upland forest understory; *Oc*

Similar species: *C. arborea* (p 140) has similar fruit but is a very large tree; *Caesalpinia gaumeri* (p 138) is a large tree with channeled trunk, and its leaves lack glands.

B (one leaf), B, B, B

Havardia albicans (Kunth) Britton & Rose – chukum

Fabaceae: Mimosoideae



Key features: multi-stemmed, horizontally-stretched prickles; wet areas

Form: medium; usually with dominant stem plus large additional stems growing from tree base

Bark: smooth, with horizontally-stretched prickles

Leaf: pinnules light green, small

Flower: in spherical heads **Fruit:** (photo)

Ecology: riparian and other low-lying, wet areas; *Oc*

Similar species: *Cojoba arborea* (p 140) and *Lysiloma latisiliquum* (p 143) are large, upland forest trees, with scaly bark and no prickles; *Mariosousa usumacintensis* (p 144) is in riparian and secondary forests but has scaly reddish bark and no prickles; *Senegalia glomerosa* (p 145) is in riparian and secondary forests but has less prominent prickles and is not multi-stemmed.

B, B, T

Lysiloma latisiliquum (L.) Benth. – salám, rain tree

Fabaceae: Mimosoideae



Key features: bark with large, thick, rectangular scales

Form: large **Bark:** light gray-brown; thick, rectangular scales

Leaf: pinnules small; glands usually at mid-petiole and between the first and final pairs of leaflets

Flower: (photo) **Fruit:** (photo)

Ecology: dry upland forest; *Un*

Similar species: *Cojoba arborea* (p 140) can be very large, with buttresses and irregularly scaly bark; *Havardia albicans* (p 142), in wet areas, has smooth bark and prickles; *Mariosousa usumacintensis* (p 144) has reddish, scaly bark; *Senegalia glomerosa* (p 145) has smooth, light bark with prickles; *Albizia tomentosa* (right, ng) is a smaller tree with smooth or slightly scaly bark.

Albizia tomentosa



Mariosousa usumacintensis (Lundell) Seigler & Ebinger – jesmo, guin
Fabaceae: Mimosoideae



Key features: bark reddish, densely scaly; pinnules small

Form: large **Bark:** reddish (more so than in the picture above), densely scaly

Leaf: pinnules small

Flower: (photo) **Fruit:** (photo)

Ecology: edges, secondary forest, riparian forest; *Co*

Similar species: *Cojoba arborea* (p 140) can be very large and has different bark; *Havardia albicans* (p 142) has smooth bark and prickles and is found in wet areas; *Lysiloma latisiliquum* (p 143) has bark with large, rectangular scales; *Senegalia glomerosa* (p 145) has light-colored, smooth bark, with prickles.

Senegalia glomerosa (Benth.) Britton & Rose – white tamarind

Fabaceae: Mimosoideae



Key features: bark whitish, smooth, usually with prickles; pinnules small

Form: large; open canopy **Bark:** whitish, smooth; prickles small, sparse

Leaf: petiole with glands at base; pinnules small; branch and twig with prickles

Flower: terminal panicles of dense, small heads, conspicuous in ~November **Fruit:** pod narrowly oblong, flattened

Ecology: secondary, riparian, and dry upland forest; *Oc*

Similar species: *Cojoba arborea* (p 140) can be very large and has different bark; *Havardia albicans* (p 142) has prominent prickles and occurs in wet areas; *Lysiloma latisiliquum* (p 143) has bark with large, rectangular scales; *Mariosousa usumacintensis* (p 144) has scaly reddish bark and lacks prickles.

Vachellia gentlei (Standl.) Seigler & Ebinger – bull’s horn acacia,
cockspur

Fabaceae: Mimosoideae



Key features: twigs with paired swollen spines, trunk tall and slender, glands on rachis

Form: medium; markedly slender for its height; small, irregular canopy often hard to see

Bark: tan and reddish vertical stripes; smooth, becoming fissured

Leaf: branches and twigs with paired swollen spines inhabited by ants; glands on rachis between leaflets; yellow protein bodies sometimes on pinnule tips (when not already harvested by ants)

Flower: yellow, in spikes **Fruit:** pod, linear-oblong; seed in yellow aril

Ecology: in all forest type but bajos, not in driest sites; provides food (yellow bodies attached to pinnules [“Beltian bodies”, after Thomas Belt]) and hollow-spine nest sites for ants, which protect the tree from herbivores and vines; seems to grow up fast through small canopy openings, thus attaining its slender form; *Co*

Similar species: It is uncertain if there are other swollen-thorn *Vachellia* spp. in the area.

***Zygia* sp.** – (ni)

Fabaceae: Mimosoideae



Key features: small tree, one pair very large leaflets, three pairs very large pinnules per leaflet, flowers and fruits on trunk

Form: small **Bark:** lenticillate, eruptive scars where flowers and fruits developed

Leaf: large; one pair of very large leaflets, usually three pairs of very large pinnules (a pinnule near leaflet base sometimes missing); rachis woody; large gland between leaflets (at first glance leaf arrangement may appear to be simple opposite or compound-pinnate opposite)

Flower: blossom directly from bark, “shaving brush” form

Fruit: pod hangs from trunk

Ecology: upland forest understory, riparian forest; different species likely have different habitat affinities; *Co*

Similar species: *Zygia* spp.: distinctions under study.

Pithecellobium hymenaeifolium (right, ng) has two leaflets, with gland between; two pinnules per leaflet, with gland between; large trunk thorns; in wet areas.



Pithecellobium hymenaeifolium

8 COMPOUND-PALMATE ALTERNATE LEAVES

Ceiba pentandra (L.) Gaertn. – ceiba, cotton tree

Malvaceae



Key features: very large tree, broad crown, large prickles

Form: very large; columnar, buttresses large, canopy broad, branches large and ~verticillate

Bark: green vertical stripes (younger stems), usually with conical prickles

Leaf: clustered at branch tip; leaflet narrow, pointed; deciduous

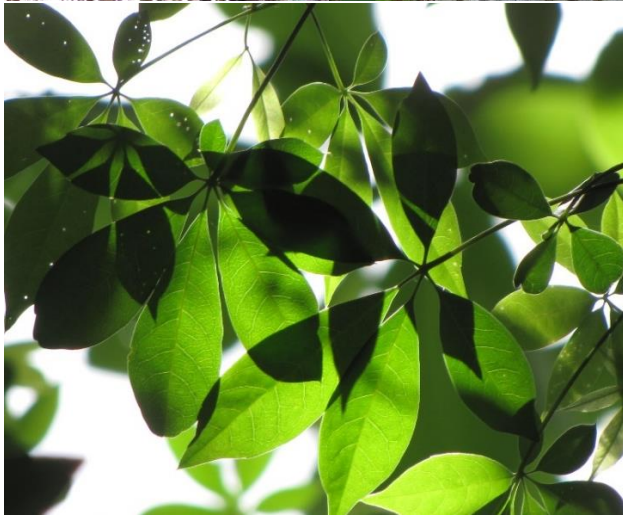
Flower: white or pink, “shaving brush” **Fruit:** large capsule; seed in kapok (cottony fluff)

Ecology: widespread, except bajos; long-lived pioneer; kapok formerly used for life preservers; *Un*

Similar species: *C. schottii* (p 149) has ridged bark and a smaller leaf; *Pachira aquatica* (p 150) lacks prickles and is in wet areas; *Pseudobombax ellipticoideum* (p 151) has some green bark, broad leaflets, and no prickles; *Handroanthus guayacan* (p 152) and *Vitex gaumeri* (p 153) have opposite leaves.

Ceiba schottii Britten & Baker f. – (ni)

Malvaceae



Key features: ridged bark; dense, connected prickles

Form: very large; small buttresses **Bark:** ridged, with dense, longitudinally connected prickles on trunk and branches

Leaf: leaflet pointed, entire or weakly toothed

Flower: “shaving brush” form **Fruit:** capsule; seed in kapok (cottony fluff)

Ecology: dry upland forest; *Un*

Similar species: *C. pentandra* (p 148) has a larger leaf with more leaflets; *Pachira aquatica* (p 150) lacks prickles and is in wet areas; *Pseudobombax ellipticoideum* (p 151) has some green bark, broad leaflets, and no prickles; *Handroanthus guayacan* (p 152) and *Vitex gaumeri* (p 153) have opposite leaves.

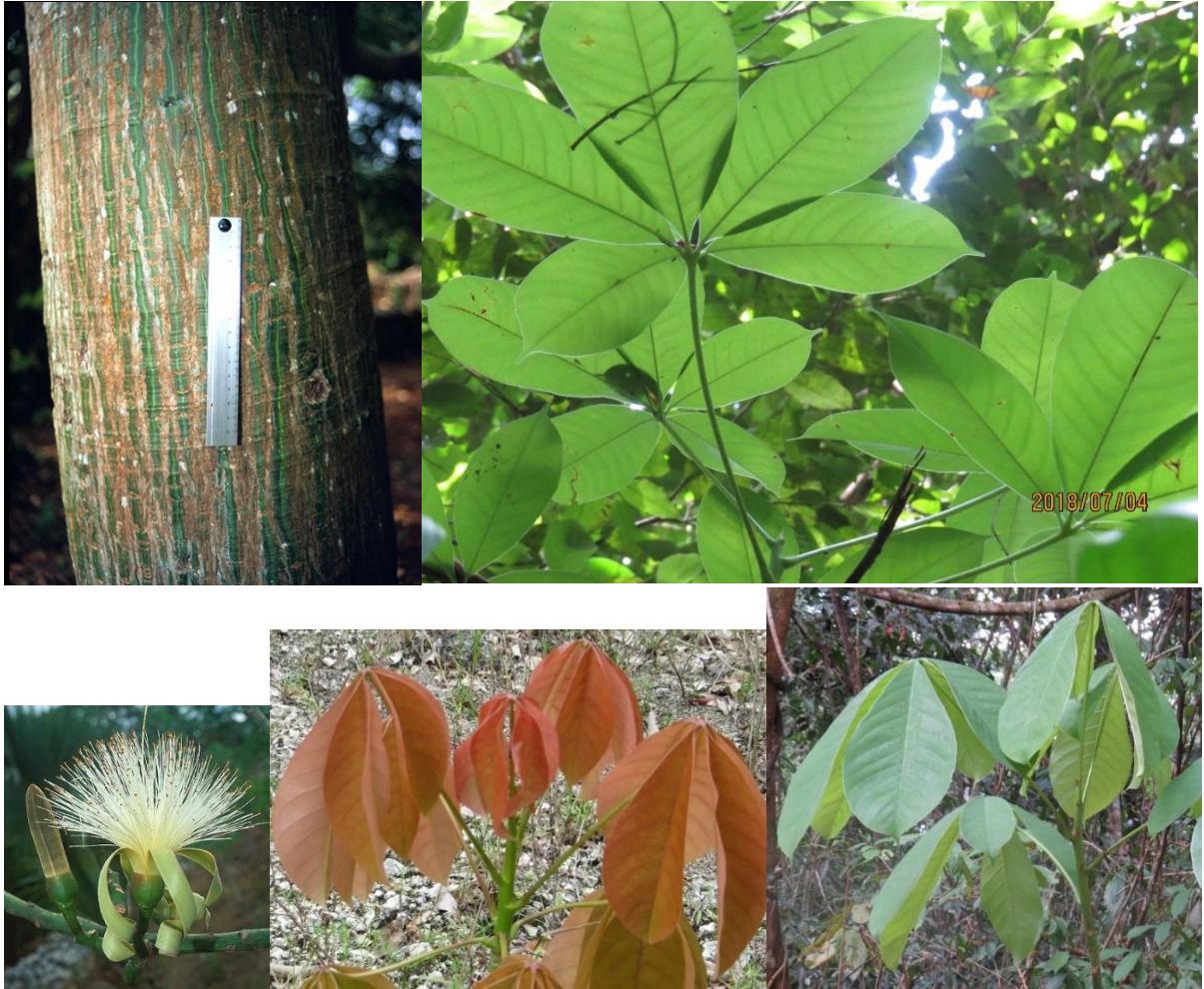
Pachira aquatica Aubl. – provision tree

Malvaceae

**Key features:** buttresses and stilt roots, leaflet broad, wet areas**Form:** large; buttresses much like stilt roots **Bark:** gray or coffee-colored, fissured**Leaf:** clustered at branch tip; petiole long; leaflet broad in shade, narrow in canopy**Flower:** (photo), few flowers at one time **Fruit:** capsule, very large; seed large, brown, angular shape**Ecology:** river and pond edges, abundant in forests on ancient raised fields below ancient Maya site Wari Camp; Co**Similar species:** *Ceiba pentandra* (p 148) (usually) and *C. schottii* (p 149) have bark prickles; *Pseudobombax ellipticoideum* (p 151) has some green bark and is in dry sites; *Handroanthus guayacan* (p 152) and *Vitex gaumeri* (p 153) have opposite leaves. Of these, only *H. guayacan* often occurs in wet areas.

Pseudobombax ellipticoideum A. Robyns – mapola

Malvaceae



Key features: very large tree, bark green-striped on smaller trunks and branches, leaflet broad

Form: very large; small buttresses, trunk frequently leaning, branches thick **Bark:** green-striped on smaller trunks and branches, smooth

Leaf: leaflet broad; young leaf red; deciduous

Flower: “shaving-brush” form **Fruit:** capsule, green- and brown-striped, ellipsoid; seed in kapok

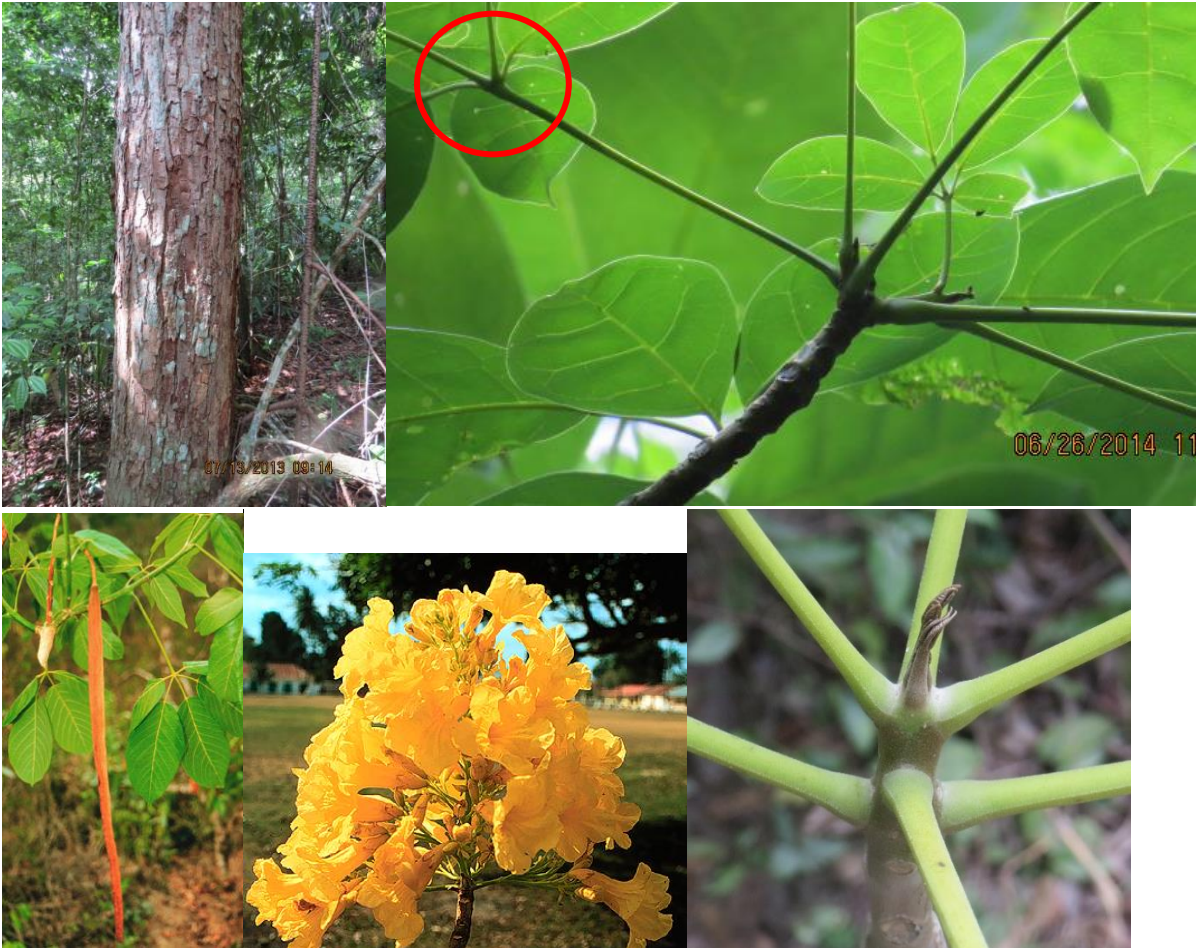
Ecology: dry upland forest hills; long-lived pioneer; *Co*

Similar species: *Ceiba pentandra* (p 148) usually, and *C. schottii* (p 149) have bark prickles; *Pachira aquatica* (p 150) lacks prickles and is in wet areas; *Handroanthus guayacan* (p 152) and *Vitex gaumeri* (p 153) have opposite leaves.

9 COMPOUND-PALMATE OPPOSITE LEAVES

Handroanthus guayacan (Jacq.) S.O. Grose – yellow mayflower,
cortéz

Bignoniaceae



Key features: compound-palmate opposite leaves

Form: large; small buttresses, horizontal layers of branches evident in distant view **Bark:** fissures, developing linear scales

Leaf: petiole and petiolules long; no stipule scar between leaf pairs; deciduous

Flower: (photo), flowering after leaf fall **Fruit:** pod thin, long; seed with papery wings

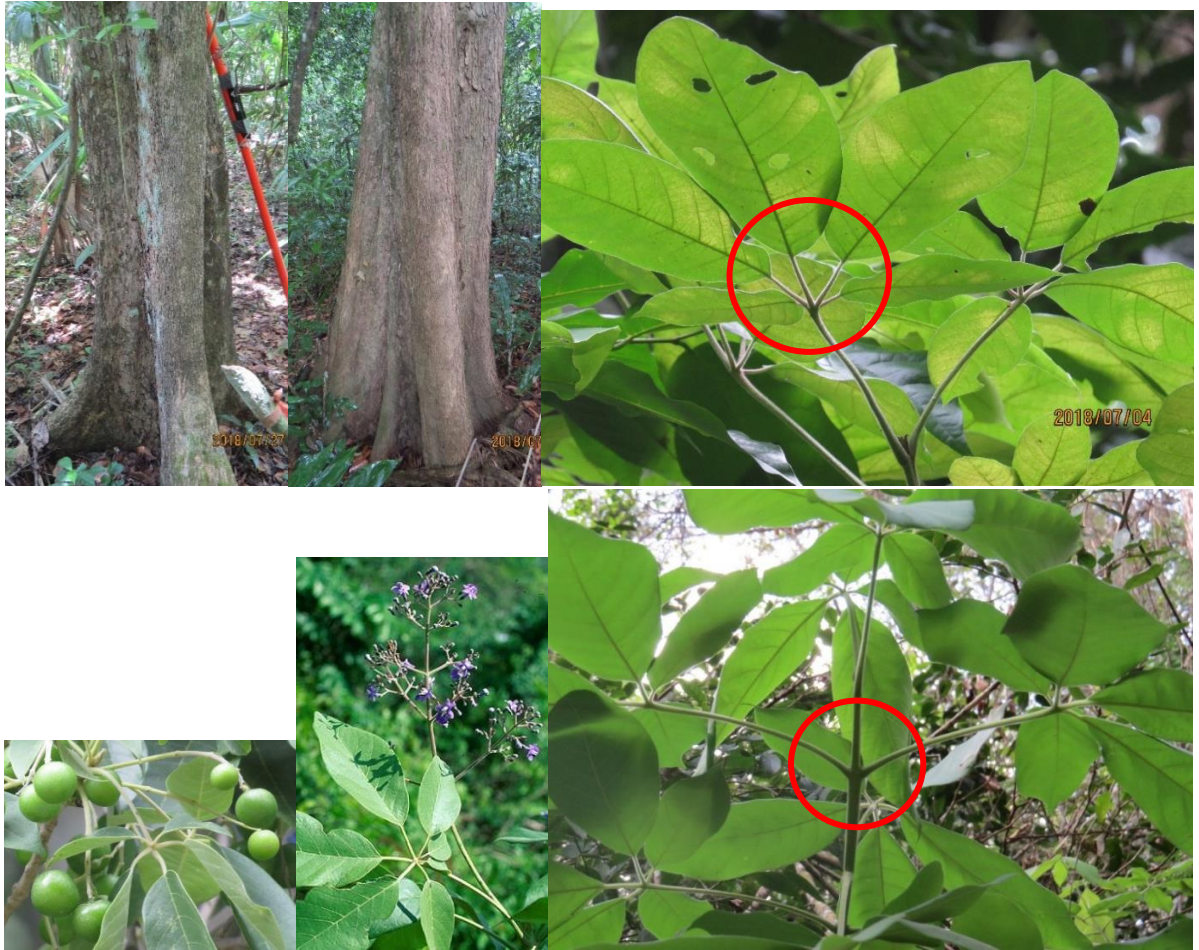
Ecology: moist upland forest and near ponds and other wet areas; *Un*

Similar species: Other *Tabebuia* spp. may be in the area. *Vitex gaumeri* (p 153) has an irregular, convoluted trunk, interpetiolar stipule scars, and dull green leaves; other species with palmate leaves have alternate leaves. When *Amyris elemifera* (p 136) is trifoliolate it may appear to be compound-palmate opposite.

B, B, B (petiole bases), P, P

Vitex gaumeri Greenm. – fiddlewood, yashnik

Lamiaceae

**Key features: convoluted trunk, compound-palmate opposite leaves****Form:** large; channeled or convoluted, buttressed trunk **Bark:** tan, slightly scaly**Leaf:** petiole long; stipule scar between leaf pairs; mature leaflet dull light green**Flower:** blue, in panicles **Fruit:** berry, in cluster resembling grapes**Ecology:** dry (mainly) and moist upland forest, secondary forest; long-lived pioneer; *Oc***Similar species:** *Handroanthus guayacan* (p 152) does not have a channeled trunk, lacks interpetiolar scars, and has brighter green leaves; other species with palmate leaves are alternate.When *Amyris elemifera* (p 136) is trifoliate it may appear to be compound-palmate opposite.

10 PALMS

Attalea cohune Mart. – cohune, corozo

Arecaceae



Key features: large tree; leaf large, pinnate

Form: large (but mostly short in riparian forest); leaf bases often persistent; juveniles consist of terrestrial clusters of large leaves on no visible stem **Bark:** smooth, with trunk-encircling rings

Leaf: very large; pinnate; leaflets extend in ~one plane

Flower: on large stalk among leaf bases; scattered on ground **Fruit:** berry tan, large, hard, in large cluster; accumulating on ground

Ecology: local in riparian forests and in moist upland forests on deep soil, where it can be very abundant, forming “cohune ridge” (p 163); recently dead stems leave large holes in the ground; *Ab*

Similar species: *Roystonea regia* (p 159) has a green shaft on its stem below the crown; *Bactris* spp. (p 155) are small, colonial, and spiny; *Gaussia maya* (p 158) is medium-sized and always leaning; *Acrocomia aculeata* (ng) has bark spines and leaflets that extend in many planes and is not in our area.

Bactris major Jacq. – pokenoboy

Areaceae



Key features: small tree, colonial, spiny on all surfaces, leaf pinnate, leaflets in one plane

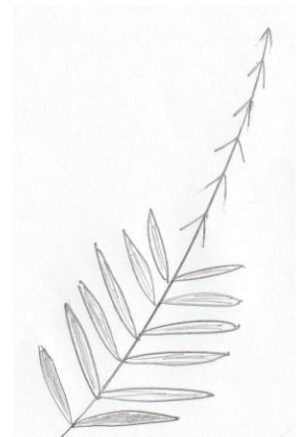
Form: small; slender-stemmed, in colonies (clumped stems) **Bark:** with long, thin spines

Leaf: pinnate; leaflets extend in one plane, along the rachis are interrupted by a gap ~15 cm from the leaf base, leaving a separate set of leaflets at the base (Brewer 1999); leaf sheath, petiole, and rachis with mixed short and long spines

Flower: white, in spiny spathe (modified leaf around flowers) **Fruit:** (photo)

Ecology: upland forest understory; *Oc*

Similar species: leaflets of *B. mexicana* (ng) spread in different planes and are continuous from leaf tip to base, and it is found in wet areas; *Cryosophila stauracantha* (p 157) is the only other tree palm with spines in our area, but it has a palmate leaf; *Desmoncus orthacanthos* (“bayal”, right, ng) is a climbing palm (rattan) with dense spines similar to those of *Bactris* spp., but its leaves have paired climbing “hooks” toward the leaf tip.



Desmoncus orthacanthos,
“bayal”; a climbing palm,
or rattan

***Chamaedorea* spp. – xate**

Arecaceae



Key features: small tree, bark green and smooth, leaf pinnate

Form: small **Bark:** green, smooth

Leaf: pinnate

Flower: in spadix (thick spike) among leaves **Fruit:** (photo)

Forest type and ecology: dry and moist upland forest understory; *Ab*

Similar species: Other palm species with pinnate leaves: *Attalea cohune* (p 154) and *Roystonea regia* (p 159) are large; *Bactris* spp. (p 155) are small, colonial, and spiny; *Gaussia maya* (p 158) is medium-sized. See Brewer (1999) for a key to Belize palms, including the many species of *Chamaedorea*.

Cryosophila stauracantha (Heynhold) R. Evans – escoba,
give-and-take

Arecaceae



Key features: small tree; stem with light-colored, branched spines; leaf palmate

Form: small to medium; juveniles consist of terrestrial clusters of leaves on no visible stem

Bark: light-colored; branched spines, sometimes lost on upper stem

Leaf: palmate

Flower: in branched inflorescence among leaves **Fruit:** berry, white

Ecology: moist upland forest understory; the most abundant small tree species in the area. Among its widespread and abundant population, *C. stauracantha* fruit seems to be available at least somewhere in the forest throughout the year, which may be important to wildlife (Hess 1994); *Ab*

Similar species: *Bactris* spp. (p 155) are the only other tree palms with spines in our area, but they have pinnate leaves and are colonial. Other palms with palmate leaves: *Sabal mauritiiformis* (p 160) is a large tree with much larger leaves; *Acoelorrhapha wrightii* (ng) is colonial, has prickles on the petiole, and is found in savannas and some bajos, not in the forest. *S. mauritiiformis* (p 160) juveniles in the understory have leaves much larger than those of *C. stauracantha* juveniles.

B, P, B, P, B

Gaussia maya (O.F. Cook) Quero & Read – palmasito, maya palm

Arecaceae



Key features: trunk curved and leaning, bark tan, leaf pinnate

Form: medium; trunk curved and always leaning **Bark:** gray to tan; smooth, with trunk-encircling rings

Leaf: pinnate; leaflets extend in multiple planes

Flower: in branched inflorescence borne among the leaves **Fruit:** red berry

Ecology: dry upland forest on slopes, and in dry microsities in moist upland forest; *Oc*

Similar species: *Attalea cohune* (p 154) and *Roystonea regia* (p 159) are large; *Bactris* spp. (p 155) are small, colonial, and spiny; *Chamaedorea* spp. (p 156) are small.

Roystonea regia (Kunth) O.F. Cook – royal palm

Areaceae



Key features: often emergent, trunk below crown enclosed in green leaf sheath, leaf pinnate

Form: large, often emerging above main forest canopy; trunk swollen near base **Bark:** greenish or gray; smooth, resembling a concrete column, trunk-encircling rings; upper part enclosed with green leaf sheath

Leaf: pinnate; leaflets extend in multiple planes; leaf bases form smooth, green shaft below crown

Flower: panicles, at bottom of leaf sheath **Fruit:** berry, purple, ellipsoid, hard

Ecology: riparian and other areas of low-lying wet forest; *Oc*

Similar species: *Attalea cohune* (p 154) lacks the green shaft; *Gaussia maya* (p 158) is medium-sized and lacks the green shaft.

Sabal mauritiiformis (H. Karst.) Griseb. & H. Wendl. – botán, bayleaf
palm

Arecaceae



Key features: large tree; leaf palmate, large

Form: large; trunk slender and tall; juveniles consist of terrestrial clusters of large leaves on no visible stem **Bark:** gray or tan; smooth, with trunk-encircling rings

Leaf: large; palmate; used for thatch

Flower: in large panicles **Fruit:** black berry

Ecology: most abundant in transition forest, also in riparian and moist upland forest; *Co*

Similar species: Other palms with palmate leaves: *Cryosophila stauracantha* (p 157) is small, with smaller leaves and has spines; *Acoelorrhapha wrightii* (ng) is colonial, has prickles on the petiole, and is found in savannas and some bajos, not in the forest. *C. stauracantha* juveniles in the understory have leaves much smaller than those of *S. mauritiiformis* juveniles.

B (juvenile in background left), B, B

Appendix

Environment and Forests of La Milpa

This is a brief introduction to the environment and forests of the La Milpa area (within ~10 miles [16 km] of La Milpa ruins and La Milpa Lodge) in the Rio Bravo Conservation and Management Area (RBCMA), northwest Belize (Fig. 1). For more information go to: ecologynwbelize.org. At La Milpa Lodge (www.pfbelize.org), the Mahogany Trail has name-tagged trees.

Climate

La Milpa receives about 1500 mm (60 in) of rain per year. December or January to May are usually dry months and the rest of the year is comparatively wet (Fig. 2). The rainfall total and the length of dry and wet seasons varies year to year.

Soils and topography

Soils are derived from limestone. Topography includes level and gently rolling areas, hills, valleys, and escarpments cut by deep ravines. Topography influences soil type and soil moisture, which influence the local composition of tree species, creating different forest types on different topographic settings. Where hill and valley are closely juxtaposed, contrasts between forest types are obvious. Elsewhere, the gently varying topography over much of the RBCMA produces long, shallow gradients of soil conditions, along which forest types, with their component species, are recognizable but blend into each other.

Vegetation history

Tropical forest has existed in the area since the end of the Pleistocene (~11,700 years ago). The ancient Maya cut much of the forest in what is now the RBCMA, but the forest has regrown in the 1100 years since the Maya decline. From the mid-nineteenth century the area has been exploited for mahogany (*Swietenia macrophylla*) and the sap of the chicle tree (*Manilkara zapota*). There have also been some small milpas (farm plots) and natural disturbances such as treefalls and hurricanes. But much of the forest is old growth.



Figure 1 – Location of La Milpa (LM). (Map: Envir. Research Inst., Belize.)

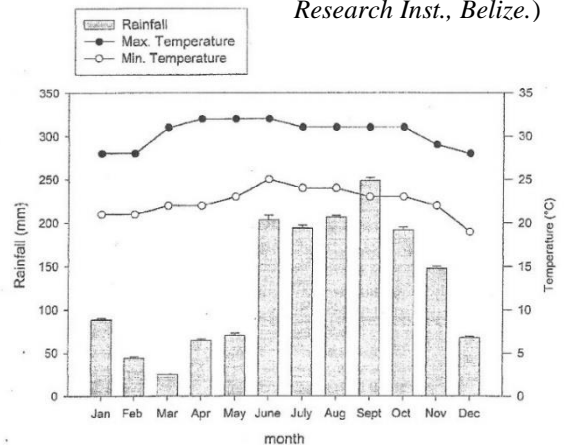


Figure 2 – Monthly rainfall and maximum and minimum temperatures at Chan Chich Lodge in northwest Belize, about 20 miles southwest of La Milpa (averages of 5 years' data, 1988-1993, Tom Harding; graph by Jennifer Palmiotto).

Forest types

Upland forest occurs on well-drained soils. Its upper canopy is 15-20 m high, with some taller trees

(Fig. 3). An inventory of a 1-hectare (10,000 m²) plot of dry upland forest (upper slopes) recorded 700 trees ≥ 10 cm diameter, of about 56 species (73 species cumulative for two inventories 25 years apart).

In a hectare of moist upland forest (lower slopes) there were 450 trees of 48 species (59 cumulative). Common tree species in the upland forest are

Pouteria reticulata (zapotillo), *Pouteria amygdalina* (silión), *Drypetes brownii* (male bullhoof), *Manilkara zapota* (chicle, sapodilla), *Pseudolmedia spuria* (wild cherry), *Brosimum alicastrum* (ramón, breadnut), *Sabal mauritiformis*

(botán, thatch palm), *Hirtella americana* (pigeon plum), and (locally) *Ampelocera hottlei* (female bullhoof). The subcanopy palm *Cryosophila stauracantha* (give-and-take, escoba) and the shrub *Piper psilorhachis* (Spanish elder) are abundant. From place to place there is much variation in the species composition and structure of upland forest. The Mahogany Trail, near the field station, starts in cohune palm forest (see below) but mainly passes through upland forest.

Bajo forest (“bajo”) is found on clay soils that are waterlogged in the wet season and edaphically dry (holding moisture too tightly for plants to extract it easily) in the dry season. It is a dense forest of small stems mostly 3-8 m tall, with some taller (Fig. 4). Tree species typical of bajos are: *Byrsonima bucidaefolia* (craboo), *Coccoloba reflexiflora*, *Gymnopodium* cf. *ovatifolium* (bastard logwood), *Croton* spp. (first three not treated in this guide) and others, while a few from dry upland forest also occur there. Bajos usually have a sedge groundlayer and sometimes dense “sawgrass” (a sedge, Cyperaceae) (Fig. 4). As with upland forest, there is great variation among bajos. Visit the “Bajo Trail” near the field station to see bajo forest (tall type).

Transition forest occurs in areas intermediate between upland forest and bajo. It largely resembles dry upland forest in structure, but is somewhat shorter, and has some features of

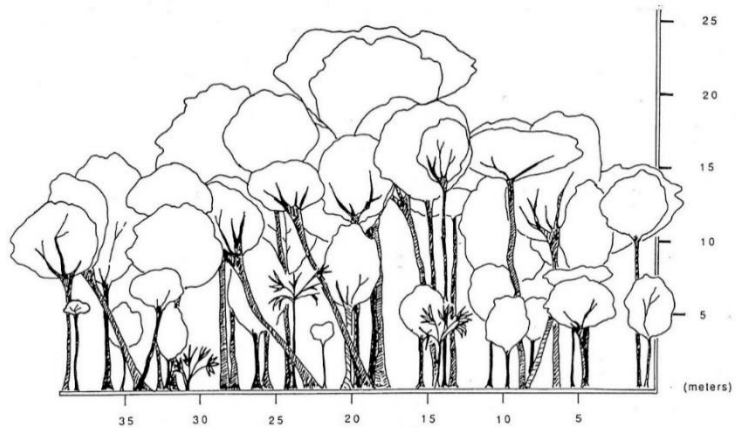


Figure 3 – Representative profile of a 40 x 10 m plot of upland forest. Mostly trees ≥ 10 cm diameter are shown; understory mostly not shown. (Drawn by Jennifer Palmiotto, using average values of tree height and density.)



Figure 4 – Bajo.

bajos. Some typical tree species of transition forest are *Calophyllum brasiliense* (santa maría), *Gymnanthes lucida* (pi), *Manilkara zapota* (chicle), *Matayba oppositifolia* (boyjob), and *Metopium brownei* (poisonwood).

Riparian forest occurs along the seasonally flooded margins of the Rio Bravo. It tends to have a broken canopy (due to poor tree anchorage and resultant treefalls), with much liana (woody vine) cover and occasional large emergent trees. In a 1-hectare plot of cohune palm riparian forest there were 394 trees ≥ 10 cm dbh, of 59 species (81 species cumulative for two censuses 25 years apart). *Attalea cohune* (cohune) was a dominant in this plot, as in some other areas of riparian forest, but it can also be uncommon in this forest type. Other species include some of those common in upland moist forest and such characteristic species as *Inga sapindoides* (bribri), *Terminalia buceras* (bullet tree), *Pachira aquatica* (provision tree), *Pterocarpus rohrii* (mountain kaway), *Zygia* sp., *Vachellia gentlei* (ant acacia), and *Ficus* spp. (fig). Walk to the end of the road passing the Dos Barbaras Maya site to see riparian forest along the Rio Bravo.

Cohune palm forest (“cohune ridge”) occurs on deep, well-drained soils. The canopy is 15-20 m high, with some taller trees. In a 1-hectare plot of cohune palm forest there were 374 trees ≥ 10 cm dbh, of 46 species (58 cumulative for two censuses 25 years apart). *Attalea cohune*, the cohune palm, is a canopy dominant, but there are many other tree species, including most that are common in upland moist forest. Soils are good for agriculture, and the abundance of long-lived successional tree species in some stands of cohune forest are evidence of past forest clearing. These successional species include *Mariosousa usumacintensis* (jesmo), *Swietenia macrophylla* (mahogany), *Tabernaemontana donnell-smithii* (cojotón), and *Ficus* spp. (fig). The first 50 m of the Mahogany Trail passes through a cohune palm forest. In this guide we do not indicate species occurrence in cohune forest, because only cohune itself is disproportionately abundant in this forest type. Also, this forest type covers little area at La Milpa.

Forest ecology

Old-growth and secondary forest. Much of the RBCMA is covered by old-growth forest probably established after the decline of the ancient Maya. Present evidence for the forest’s old-growth status includes: relatively tall and large-diameter stems of trees for this climate zone, complex three-dimensional forest structure, large lianas (woody vines), and abundant seedlings and saplings of the tree species that dominate the canopy, indicating a degree of stability in species composition. Human activity has produced secondary forest in local areas (p 11). Logging has been widespread but selective for a few, low-density species. Hurricane Janet in 1955 probably felled and delimbed many trees and promoted recruitment of secondary species, but it probably did not alter species composition greatly (a conclusion from studies on hurricane impacts elsewhere).

Species dominance, spatial distribution, species richness. In each forest type a different group of tree species dominates. In each of the four 1-hectare plots mentioned above, five to six species accounted for 50% of the stems ≥ 10 cm dbh, while the remaining 50% of stems included 53 to 41 species. There were many uncommon and rare species; in each plot 15 to 19 species were represented by only one individual. About 33 species, of 118 total (one census, not cumulative) in the four 1-hectare plots, were represented by only one individual over all the plots.

The spatial distributions of most tree species are patchy, within and among forest types. Only 13 species, of 118 total species, were found in all four 1-hectare plots (each plot in a different forest type); 65 were found in only one plot. There are many different patterns of distribution, from widespread and common species to local and rare species.

Species richness (number of species) in any one forest type (alpha diversity) is not exceptionally high (compared to forests nearer the equator), but cumulative richness across forest types (beta diversity) is high.

Forest dynamics. In the four 1-hectare plots mortality of stems ≥ 10 cm dbh ranged 25-54% over a 25-year interval between censuses, or about 1-2% of stems per year. One percent per year is typical of mature forests. Recruitment (stems growing into the ≥ 10 cm dbh class) ranged 13-52%, about 0.5-2% per year. The plot with 2% mortality and recruitment is the riparian plot, where flooding probably loosens tree roots, evidently leading to high mortality, high recruitment in openings, and high species richness. Also, high winds from a nearby hurricane killed trees in the plots during the census interval. A significant number of species were both eliminated from and added to each plot during this interval.

Seasonality of the vegetation, degree of deciduousness. Flowering, fruiting, and leaf replacement are all highly seasonal in the RBCMA. Each tree species has a different seasonal schedule, but many are similar enough that community patterns are evident (Hess 1994).

Flowering by trees, in terms of numbers of species and individual, peaks in the mid to late dry season (March and April) and is least in the late wet season (December). Fruiting patterns are less clear, but fruit abundance appears to be relatively higher in the late dry season and early wet season (June). Leaf drop is highest in the dry season. New leaves appear mostly during the dry season and early wet season.

The great majority of trees in the RBCMA are evergreen. The terms "deciduous" or "semi-deciduous", which have been applied to RBCMA forests, give an exaggerated impression of seasonal leaflessness in the forest. Only a small proportion (6-7%) of the species or of the total tree individuals are leafless at any one time, except in second-growth forest and in local situations, as where there is shallow soil.



Swartzia cubensis,
bastard rosewood

Glossary

See Harris and Harris (1994) and Parker (2008) for illustrated glossaries of botanical words (some definitions here were adapted from those publications). See an English language dictionary for many botanical words. “p” indicates page in this guide where some words are defined in more detail.

Ab – abundant, p 11

above – usually referring to top side of leaf

acuminate – abruptly pointed

alternate leaves – leaves arranged alternately or irregularly on a branch, p 6

apex – petiole end connected to leaf base

aril – fleshy cover around seed

asperous – abrasive, like sandpaper

axil – **1.** point on upper side of junction of petiole and twig, or of petiolule and rachis, **2.** point on leaf where secondary vein joins midvein;

axillary – in axils

bajo – poorly drained area in upland level areas, with clayey soil, supporting short dense forest comprised of trees adapted to seasonally extreme wet and dry soils, p 162

becoming – assuming a characteristic with age or increasing size

below – usually referring to bottom side of leaf

bipinnate leaf – leaf twice compound: leaflets are further subdivided into pinnules, p 8

blade – broad part of a leaf, leaflet, or pinnule, i.e., exclusive of petiole or petiolule

bullate – blade swollen between veins

buttress – flange extending from base of tree to ground; compare **stilt root**

berry – pulpy fruit with seed(s); compare **drupe**

canopy – uppermost array of foliage of a tree or of the forest as a whole

capsule – dry fruit that dehisces (opens) to reveal or release seeds

catkin – pendant spike of flowers

cf. – used when genus is known but species is not certain yet appears to be a particular species

channeled – trunk with rounded, vertical grooves, like a fluted column

Co – common, p 11

columnar – trunk large, straight, ~round in cross-section; with or without buttresses

compound leaf – leaf in which the blade is divided into multiple blades, i.e., leaflets, p 7-9

connecting vein – vein inside leaf margin that connects the ends of secondary veins

cordate – having a leaf base shaped like the indented top of a valentine heart

cyme – flowers grouped in an inflorescence with a flat or round top

developing – assuming a characteristic with age or increasing size

drupe – fleshy fruit with hard pit enclosing seed; compare **berry**

edge – **1.** margin of leaf, **2.** transition zone between forest and non-forest

elliptic – outline widest near middle; **ellipsoid** – elliptic in all longitudinal planes

entire – leaf margin (edge) smooth, without teeth

epiphyte – plant growing on another plant and not rooted to the ground.

even-pinnate – having an even number of leaflets

fascicle – cluster

fissured – for bark with parallel, vertical, shallow grooves in otherwise ~smooth bark

gland – small secreting structure, cup-shaped or protuberant, or appearing to be such

hilum – scar on seed, left by ovary attachment

inflorescence – flower cluster

interpitiolar – refers to the area, stipules, or scars on a twig between petioles of opposite leaves

kapok – cotton-like fluff

leaflet – blade subdivision of a compound leaf

lenticel – small protuberances on smooth bark, for gas exchange; **lenticillate** – having lenticels

linear – long and narrow

margin – edge of leaf

midvein – large vein extending along the center of the leaf, base to tip

monopodial – having a trunk that does not have major, large branches

ni – no information

ng – species not fully treated in this guide

node – point where leaf petiole attaches to the twig

oblanceolate – broader toward tip, tapering to base

oblong – ~elliptic, but sides extended and parallel

obovate – outline wider near tip; compare **ovate**

obscure – hard to see

obtuse – blade blunt or rounded at tip or base

Oc – occasional, p 11

odd-pinnate – having an odd number of leaflets

opposite leaves – paired leaves arranged opposite to each other on a twig, p 7

ovate – having outline of an egg: rounded at ends but more widely near base; compare **obovate**

p – page; **pp** – pages

palmate – leaflets or veins originating at one point and radiating like the fingers on a hand, p 9

panicle – compound inflorescence; the branches branch themselves

petiole – stalk that attaches leaf to twig

petiolule – stalk that attaches leaflet to rachis

pinnate leaf – compound leaf with leaflets arranged on rachis, p 7-8

pinnule – blade subdivision of a leaflet

pioneer – shade intolerant species that colonizes open areas

pocked – with circular indentations

prickle – sharp-pointed structure that arises from the outer layer of trunk or branch

pubescent – covered with short hairs

pulvinus – swelling at base or apex of petiole or petiolule

raceme – unbranched inflorescence

rachis – main axis of a compound leaf; anatomically the leaf midvein

ridged – for bark with vertical, parallel, crested surfaces, with crevices between

riparian forest – forest along rivers, sometimes flooded, p 163

reticulate – forming an irregular network

scaly – for bark with peeling patches

scar – vestige of leaf, stipule, etc. attachment point

secondary forest – forest grown up from a cleared area in the last ~100 years

secondary vein – vein leading from the midvein

simple leaf – leaf consisting of one blade, p 6

smooth – for bark, lacking scales, ridges, etc.

sp. – species in the singular; used when genus is known but species is not; **spp.** – species in the plural; used when a genus is specified that includes multiple species not named

spike – unbranched axis with sessile flowers;

spike-like – extended and sharp pointed

spine – sharp-pointed structure that is a modified leaf; compare **prickle, thorn**

stem – used variously for trunk, branch, twig

stilt root – branch-like extension from lower trunk to ground; compare **buttress**

stipule – leaf-like structure covering a leaf bud and variably persistent among species after leaf development

strangler – a tree that germinates on another tree, grows roots down and a stem up and can eventually surround and outlive the host

subopposite – nearly opposite

terminal – at the further end of a rachis, twig, etc.

tertiary vein – vein leading from secondary veins

thin – for leaf blade: with little breadth between top and bottom surfaces

thorn – sharp-pointed modified stem

toothed – having a jagged leaf margin (edge)

translucent – allowing light to pass through

trifoliolate – having three leaflets

trinervate – midvein and vein on each side extend parallel to each other and join at leaf tip

transition forest – forest intermediate in structure and species composition between upland and bajo forests, p 162

two-ranked – alternate or opposite leaves attached at regular intervals on opposite sides of a twig and extending in the same plane

Un – uncommon, p 11

understory – vegetation in the vertical space between the groundlayer of herbs and the lower leaves of medium and large trees

upland forest – forest on hills or on well-drained level areas, p 162; **dry upland forest, moist upland forest**, p 11

venation – relating to veins in leaf or leaflet

verticillate – extending radially from one point, like spokes; p 31

Bibliography

For detailed descriptions of most species in this guide see Standley and Steyermark (1946-1974) and Parker (2008), but check the *Tropicos*[®] website (p 169) for taxonomic revisions. For plant family characteristics see Gentry (1993), Maas and Westra (1993), Keller (2004), Condit et al. (2011), and internet sites: *The Jiménez Matrix* and *Rainforest Plants* (p 169). For distinctive field marks see Condit et al. (2011). Bark is shown in detail in Barajas Morales and Pérez Jiménez (1990). For illustrated glossaries of botanical words see Harris and Harris (1994), Parker (2008); and Ribeiro et al. (1999, with abundant detail and illustrations). *Merriam-Webster's Collegiate Dictionary, Tenth Edition* defines and illustrates many botanical words. For economic and cultural uses of most species in this guide see Balick et al. (2000), Peña-Chocarro et al. (2011), and Balick and Arvigo (2015). Schulze and Whitacre's (1999) excellent study of tree ecology at Tikal, Guatemala, applies closely to La Milpa forests.

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Brosimum alicastrum,
ramón or breadnut;
with strangler fig
and termite nest

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Index

Boldface indicates scientific names of tree species fully treated in this guide. Lightface indicates 1) common names or 2) species mentioned in **Similar species** but not fully treated in this guide. An asterisk (*) following names of species in lightface indicates that there is a photo of that species in **Similar species** on the page indicated. The **Appendix** is not covered by this index.

- Acacia*, see **Mariosousa**,
Senegalia, **Vachellia**
Acoelorrhaphe wrightii, 157
Acosmium, see **Leptolobium**
panamense, 112
Acrocomia aculeata, 154
Adelia barbinervis, 23
*Aegiphila monstrosa**, 82
*Albizia tomentosa**, 143
Alchornea latifolia, 63
Alibertia edulis, 97
Allophylus cominia, 128
allspice, 94
Alseis hondurensis, 81
Amaioua corymbosa, 99
Ampelocera hottlei, 61
Amyris elemifera, 136
*Annona primigenia**, 13
Aspidosperma cruentum,
15
A. megalocarpon, 16
Astronium graveolens, 103
Attalea cohune, 154
axemaster, 95
- Bactris major**, 155
B. mexicana, 155
bakelak, 49, 73
balsam of Peru, 116
barba jolote, 140
bastard cedar, 67
bastard lemoncillo, 23
bastard rosewood, 110
batidos, 31
*Bauhinia divaricata**, 30
bay cedar, 67
bayal*, 155
bayleaf palm, 160
- billy webb, 112
bitter wood, 120
bitz, 114
black cabbage bark, 113,
115
black prickly yellow, 127
Blomia prisca, 129
blossomberry, 71
botán, 160
Bourreria mollis, 19
boyjob, 137
breadnut, 33
bribri, 111
Brosimum alicastrum, 33
Bucida, see **Terminalia**
buceras, 79
bullet tree, 79
bullhoof, 47
bull's horn acacia, 146
Bursera simaruba, 107
- Caesalpinia gaumeri**, 138
caimito, 51
Calophyllum brasiliense,
87
Calyptranthes chytraculia,
92
candlewood, 80
caoba, 123
capulín, 20, 62
carbón, 122
carbón del río, 126
Casearia corymbosa, 72
Cassipourea guianensis, 96
Castilla elastica, 34
caulote, 68
Cecropia peltata, 76
Cedrela odorata, 121
- cedro, 121
ceiba, 148
Ceiba pentandra, 148
C. schottii, 149
*Celtis trinervia**, 20
Chamaedorea spp., 156
chechem, 104
chechem blanco, 65
cherry, 39, 128
chicle, 53, 83
Chrysophyllum cainito, 51
Chrysophyllum
mexicanum, 51
C. venezuelanense, 52
chukum, 142
clawberry, 41
Clusia rosea, 88
Coccoloba acapulcensis, 44
C. belizensis, 45
C. diversifolia, 46
*Cochlospermum vitifolium**,
76
cockspur, 146
cohune, 154
Cojoba arborea, 140
C. graciliflora, 141
cojón de mico, 17
cojón de perro, 85
cojotón, 75, 85, 86
copal, 108
cordoncillo, 42
corozo, 154
cortéz, 152
Cosmocalyx spectabilis, 82,
98
cotton tree, 148
Coussapoa oligocephala,
77

- cramantee, 122
 cream tree, 59
Croton sp., 24
Cryosophila stauracantha, 157
Cupania belizensis, 130
C. rufescens, 131
- Damburneya nitida**, 27
 danto, 120
Dendropanax arboreus, 18
*Desmoncus orthacanthos**, 155
Dialium guianense, 125
Diospyros nigra, 22
 dogwood, 118
Dracaena americana, 80
Drypetes brownii, 47
D. lateriflora, 48
 dzol, 133
- escoba, 157
Exostema mexicanum, 99
*Exothea diphylla**, 132
- faisán, 60
*Faramea occidentalis**, 97
 female bullhoof, 61
Ficus americana, 35
F. costaricana, 36
*F. insipida**, 37
F. maxima, 37
F. obtusifolia, 38
*F. pertusa**, 35
F. popenoei, 36
 fiddlewood, 63, 153
 fig, 35, 36, 37, 38
Forchammeria trifoliata, 128
- Gaussia maya**, 158
 give-and-take, 157
 glassy wood, 100, 103
 gombolimbo, 107
- granadillo, 135
 grande betty, 130
Guarea glabra, 122
G. grandifolia, 122
 guarumo, 76
 guaya, 132
 guayabillo, 92
Guazuma ulmifolia, 67
Guettarda combsii, 100
 guin, 144
Gymnanthes lucida, 25, 64
- Haematoxylum campechianum**, 109
Hampea trilobata, 30
Handroanthus guayacan, 152
Havardia albicans, 142
Hirtella americana, 21
*H. racemosa**, 21
 hog plum, 105, 106
 hormigo, 117
 huesillo, 128
 huevos de caballo, 75, 86
 hule, 37
*Hyperbaena winzerlingii**, 26
- indio desnudo, 107
Inga sapindoides, 111
- jabín, 118
*Jacaratia dolichaula**, 128
 jesmo, 144
 jobillo, 103
 jobo, 106
 john crow bead, 141
 john crow redwood, 101
 jug, 91
- kanak, 63
 kaway, 119
 kinep, 132
Krugiodendron ferreum, 95
- Laetia thamnina**, 49, 73
 lancewood, 13
 laurel, 27, 29
 leche maría, 66
*Lennea melanocarpa**, 115
Leptolobium panamense, 112
*Licania platypus**, 22
Licaria peckii, 28
 logwood, 109
Lonchocarpus castilloi, 113
L. luteomaculatus, 114
L. rugosus, 115
Luehea seemanii, 68
Luehea speciosa, 68
Lysiloma latisiliquum, 143
- mahogany, 123
 male bullhoof, 47
 mamey cerera, 56
 mamee apple, 58, 84
 mamee ciruela, 55
 manax, 39
 manchiche, 113
*Manilkara chicle**, 53
M. staminodella, 53
Manilkara zapota, 53, 83
 mapola, 151
Margaritaria nobilis, 41
Mariosousa usumacintensis, 144
 matapalo, 35, 38, 77, 88
Matayba oppositifolia, 137
 maya, 90
 maya palm, 158
 mayflower, 152
Melicoccus oliviformis, 132
Metopium brownei, 104
Miconia argentea, 89
M. impetiolearis, 90
 moho, 30, 69
Mosannonna depressa, 13
 mountain kaway, 119
Mouriri myrtilloides, 91

*Muntingia calabura**, 67
 mylady, 15
Myrciaria sp., 93
Myroxylon balsamum, 116

nargusta, 78
Nectandra coriacea, 29
 negrito, 134

oak, 26
Oreopanax sp. *, 18
Ormosia schippii, 117
Ottoschulzia pallida, 32
Ouratea lucens, 71
*O. nitida**, 71

Pachira aquatica, 150
 paletillo, 72
 palmasito, 158
 pi, 25, 64
*Picramnia antidesma**, 125
 pigeon plum, 21
Pimenta dioica, 94
 pimienta, 94
Piper jaquemontianum, 42
P. psilorrhachis, 43
Piscidia piscipula, 118
Pithecellobium
 *hymenaeifolium**, 147
Platymiscium yucatanum,
 135
Pleradenophora
 tuerckheimiana, 65
 poison wood, 104
 pokenoboy, 155
 polewood, 14
Pouteria amygdalina, 54
P. campechiana, 55
P. durlandii, 56
P. reticulata, 57
P. sapota, 58, 84
 prickly yellow, 127
Protium copal, 108
 provision tree, 150

Pseudobombax
 ellipticoideum, 151
Pseudolmedia spuria, 39
Pterocarpus rohrii, 119
 pucte, 79

quamwood, 139
Quararibea funebris, 31
 quebracho, 95
Quercus oleoides, 26

rain tree, 143
 ramón, 33
 red breadnut, 40, 70
 red cedar, 124
Rinorea hummelii, 102
 roble, 26
 royal palm, 159
Roystonea regia, 159

sabac-ché, 99
Sabal mauritiiformis, 160
 salám, 143
 santa maría, 87
*Sapindus saponaria**, 129
Sapium lateriflorum, 66
 sapodilla, 53, 83
 sapote, 53, 83
Schizolobium parahyba,
 139
 sebul, 52
*Semialarium mexicanum**,
 102
Senegalia glomerosa, 145
Sideroxylon foetidissimum,
 59
S. salicifolium, 60
 silión, 54
 silly young, 54
Simarouba amara, 134
Simira salvadorensis, 101
 Spanish cedar, 121
 Spanish elder, 42, 43
Spondias mombin, 105

S. radlkoferi, 106
Swartzia cubensis, 110
Swietenia macrophylla, 123

Tabebuia, see
 Handroanthus
 guayacan, 152
Tabernaemontana alba, 85
T. donnell-smithii, 75, 86
Talisia floresii, 132
T. oliviformis, see
 Melicoccus oliviformis,
 132
Terminalia amazonia, 78
T. buceras, 79
Thevetia ahouai, 17
Thouinia paucidentata, 133
 timbersweet, 28
 tinta, 109
Trema micrantha, 20, 62
*Trichilia havanensis**, 126
Trichilia hirta, 124
T. minutiflora, 125
T. pallida, 126
Trichospermum
 lessertianum, 69
Trophis racemosa, 40, 70
 trumpet, 76
Turpinia occidentalis, 103
 tzol, 129

ule, 34

Vachellia gentlei, 146
Vatairea lundellii, 120
Vitex gaumeri, 153

waika pine, 136
 waree wood, 138
 water wood, 50, 74, 96
 white gombolimbo, 18
 white grande betty, 131
 white maya, 89
 white mylady, 16

white poison wood, 65
white ramón, 40, 70
white tamarind, 145
wild coffee, 102
wild craboo, 19
wild grape, 45
wild guava, 97
wild lime, 125
wild mammee, 81
wild rubber, 34
wild soursop, 13
wild tamarind, 140

xate, 156

Xylopia frutescens, 14

yashnik, 153

yellow mayflower, 152

Zanthoxylum acuminatum, 127

Z. caribaeum, 127

*Z. ekmanii**, 127

zapote negro, 22

zapotillo, 57

Zuelania guidonia, 50, 74

Zygia sp., 147
