

ACALYPHA, CROTON AND SAPIUM IN NICARAGUA

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To report the species of Acalypha, Croton and Sapium known to occur in Nicaragua is the principal purpose of this article. At the same time, keys for identification are presented. Constructing such keys was necessary in order to identify the specimens collected by my companions and myself. It was necessary also to include all the species known to occur in Central America.

The sources employed in this paper are numerous as indicated in the bibliographies and acknowledgements. Gathering them together into two keys is calculated to save time in identification. Such a treatment as this, without full descriptions, is intended to be used with reference to familiar published works. A few characters, useful in identification, are added in the annotated list.

I wish to express my thanks to the following: Dr. Daniel B. Ward and his staff of the University of Florida; Dr. Lyman B. Smith and Dr. David B. Lellinger of the United States National Herbarium; Dr. Reed C. Rollins of the Gray Herbarium and Dr. Richard A. Howard of the Arnold Arboretum. I am much indebted to Mr. Ray Angelo for very valuable notes and observations of specimens in the Harvard Herbaria. The following, I thank for the loan of specimens from their respective herbaria: Dr. Thomas B. Croat of the Missouri Botanical Garden; Dr. Lyman B. Smith and Dr. David B. Lellinger of the United States National Herbarium; Mr. John T. Atwood of the State University of Florida.

As the outline of the leaf and its venation are featured in identification of species, line drawings have been made of a number of species. The specimen from which each drawing has been made is indicated in the annotated list following the key to each genus. My thanks to Miss Valerie D'Ippolito who made the excellent drawings!

The presence or absence of glands on the petiole or on the base of the blade is also useful in identification. It should be noted, however, that sometimes a gland may be evident on one leaf but hidden on all the other leaves.

Petals are not used in the keys because so often they are not present, and on pressed specimens, even if present, they are difficult to see.

Acalypha and Croton are so similar that the keys to species are combined into one. The key to Sapium is separate. These three genera are distinguished on the generic level mostly by the stamens, as follows:

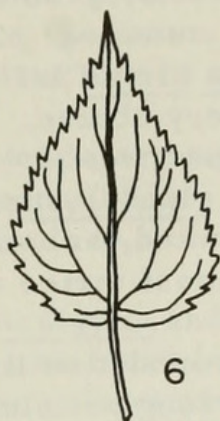
- A. Stamens in bud bent forward, the apex of the anther turned downward; flowers usually with petals, mostly in terminal racemes, p. 2, 37 Croton
- A. Stamens straight in bud the tips of the anthers erect;
 - staminate and pistillate flowers without petals B.
 - B. Segments of the staminate calyx valvate in bud; inflorescence terminal or axillary, p. 2, 28 Acalypha
 - B. Segments of the staminate calyx imbricate or open in bud; spikes mostly terminal, p. 50, 54 Sapium

ARTIFICIAL KEY TO CENTRAL AMERICAN SPECIES OF ACALYPHA AND CROTON COMBINED

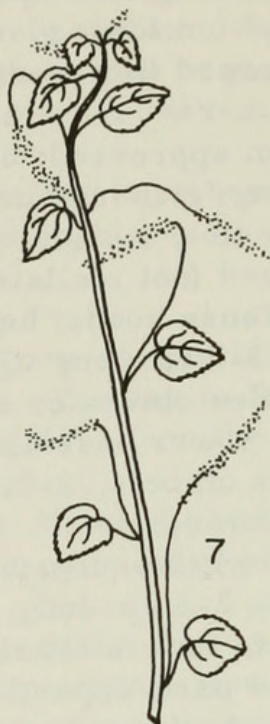
The drawings of the leaves are 2/3 life-size. From what specimen each leaf was drawn is indicated in the Annotated Lists.

- A. Blades deeply lobed palmately; petioles without glands; annual; p. 42 Croton lobatus L.
- A. Blades toothed or entire, not lobed B.
 - B. Plant an herb, rarely woody below, usually annual; stem usually 1-2 mm thick at summit; blades variously, distinctly toothed; glands near summit of petiole or base of blade C. cp. p. 7
 - C. Hairs of stem branched at base (stellate), often tufted; blades coarsely toothed; annual D. cp. p. 3
 - D. Blades triangular-ovate, acute or acuminate; petioles 2-10 mm long; glands 2, stipitate, on petioles or base of blade; ovary hirsute; capsules 3-4 mm long; seeds 3 mm long; p. 48, fig. 2, p. 6 Croton trinitatis Millsp.
 - D. Blades oblong to widely ovate, obtuse or acute; glands on base of blade E.

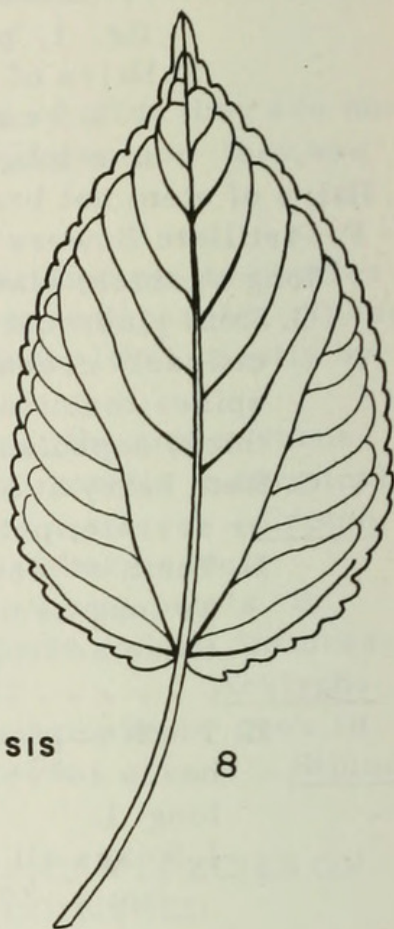
- E. Hairs of stem long stiff spreading; blades obtuse or acute, 3-7 cm long; glands stipitate, gradually thicker toward tip; seeds 2.5-3 mm long; p. 41, fig. 1, p. 6 Croton hirtus L'Her.
- E. Hairs of stem appressed; blades very obtuse, 2-3.5 cm long; glands saucer-shaped; seeds 4 mm long; p. 40 Croton glandulosus L.
- C. Hairs of stem not branched (not stellate), not tufted, or none F.
- F. Pistillate flowers in dense heads; heads at most thrice as long as thick; blades 3-7 cm long G.
- G. Stem glabrous; blades obtuse or almost rounded at tip, coarsely crenate, lower ones on rather long petioles; spikes terminal, in umbels, 2-3.5 cm long, 15 mm thick; capsules glabrous; p. 38 Croton comes S. & W.
- G. Stem hairy at least when young; blades finely crenate or serrate; petioles 2-6 cm long; capsules pilose H.
- H. Teeth of pistillate bracts short, ovate, obtuse, 1/5 as long as united part; upper heads chiefly pistillate, twice as long as thick; styles not branched; p. 34 Acalypha poiretii Sprengel
- H. Teeth of pistillate bracts long, filiform, spreading; heads 10-15 mm thick, mostly less than 3.5 cm long I.
- I. Spikes all axillary; blades gradually narrowed to tip; p. 29, fig. 5, p. 6 Acalypha arvensis Poepp. & Endl.
- I. Spikes partly terminal; blades abruptly acuminate; p. 28, fig. 6, p. 4 Acalypha alopecuroidea Jacq.
- F. Staminate and pistillate flowers in slender spikes; spikes more than thrice as long as thick, not dense, not head-like J.
- J. Stem with dense spreading glandular hairs; petioles 1-6 cm long; blades 3-9 cm long; spikes axillary or terminal, with bractless intervals, 5-12 cm long; pistillate bracts shallowly toothed; spikes unisexual or bisexual; p. 36, fig. 8, p. 4 Acalypha subviscida S. Watson
- J. Stem not stipitate-glandular K.
- K. Blades 13-14.5 cm long, 3-nerved at base; petioles, veins and spikes sparsely stigillose; petioles 2.5-4 cm long, with 2 glands; p. 34 Acalypha radino-stachy Donn. Smith
- K. Blades 1-10 cm long L.
- L. Spikes unisexual M. cp. p. 5
- M. Blades 1-2 cm long, 0.9-1.5 cm wide; petioles 0.5-2 cm long; pistillate bracts leaf-like, 7 mm long; p. 33, fig. 7, p. 4 Acalypha nicaraguensis P. & H.



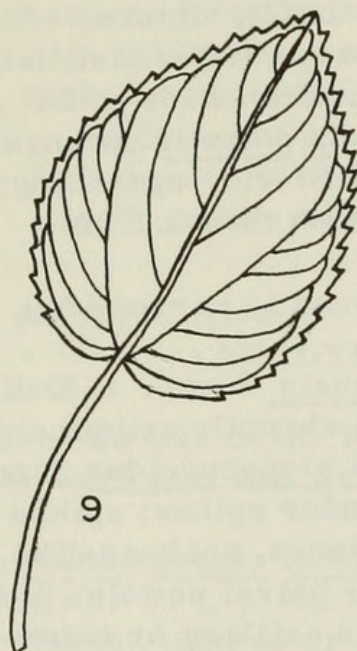
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A. alopecuroidea

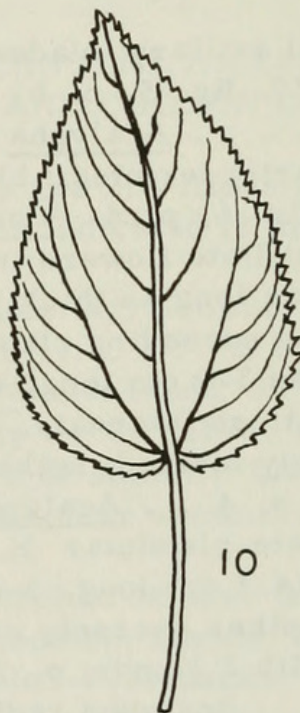
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A. nicaraguensis

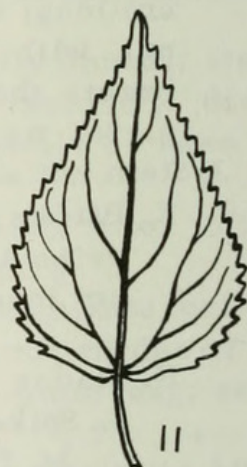
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A. subviscida

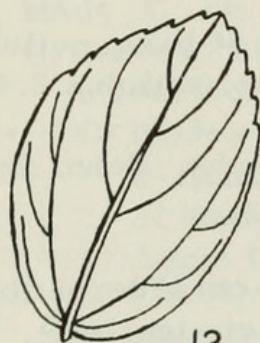
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A. salvadorensis

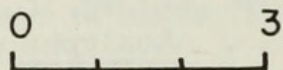
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A. persimilis

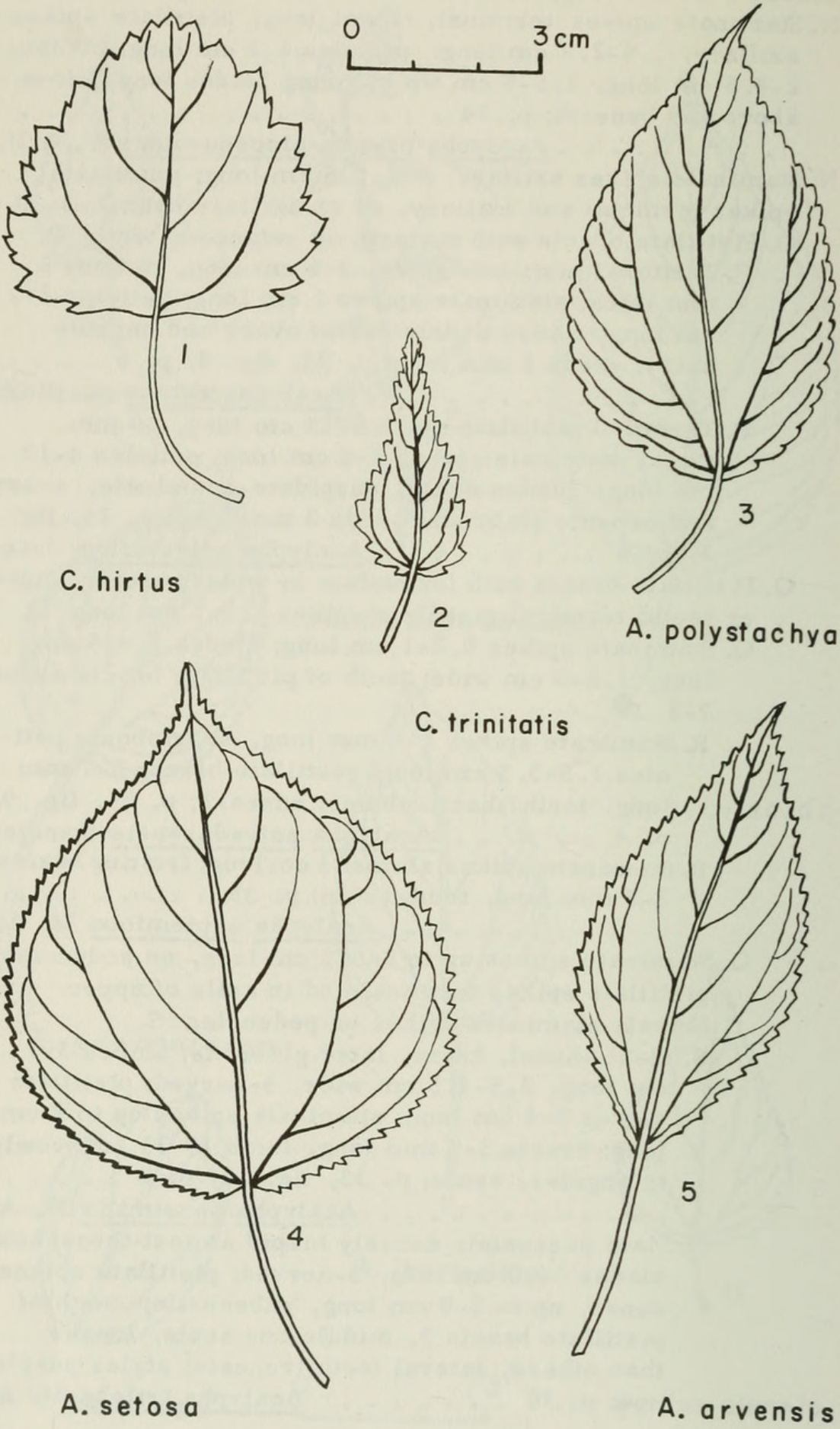
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A. guatemalensis

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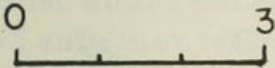
A. phleoides

- M. Blades 2-10 cm long, 1.5-9 cm wide, palmately veined N.
- N. Staminate spikes terminal, 1 cm long; pistillate spikes axillary, 1.5-2.5 cm long; petioles 1-2 cm long; blades 2-4.5 cm long, 1.5-3 cm wide; young blades long-pilose above and beneath; p. 34
 Acalypha pseudo-alopecuroides P. & H.
- N. Staminate spikes axillary, 0.2-5.5 cm long; pistillate spikes terminal and axillary, or on axillary branches O.
- O. Pistillate bracts with filiform or setaceous teeth P.
- P. Terminal pistillate spikes 3-6 cm long, in fruit 5 mm thick; staminate spikes 1 cm long; petioles 2-7 cm long; blades widely ovate; ovary and capsule hairy; seeds 1 mm long; p. 35, fig. 4, p. 6
 Acalypha setosa A. Rich.
- P. Terminal pistillate spike 6-15 cm long, 10 mm thick; staminate spikes 2-4 cm long; petioles 4-12 cm long; blades ovate, cuspidate-acuminate; ovary and capsule glabrous; seeds 3 mm long; p. 34, fig. 3, p. 6 Acalypha polystachya Jacq.
- O. Pistillate bracts with lanceolate or wider, usually shorter teeth; terminal pistillate spikes 2.5-5 cm long Q.
- Q. Staminate spikes 0.2-1 cm long; blades 2-4.5 cm long, 1.2-3 cm wide; teeth of pistillate bracts about 7-8 R.
- R. Staminate spikes 2-3 mm long, subglobose; petioles 1.5-3.5 cm long; pistillate bracts 5-7 mm long, teeth short, obtuse; annual?; p. 35, fig. 9, p. 4 Acalypha salvadorensis Standley
- R. Staminate spikes almost 1 cm long; fruiting bracts 2-3 mm long, teeth acute; p. 35
 Acalypha septemloba M. A.
- Q. Staminate spikes up to 2-5.5 cm long, on peduncles; pistillate spikes terminal and in axils of upper leaves; staminate spikes on peduncles S.
- S. Plant annual, hairy, later glabrous; blades 3-7 cm long, 2.5-4.5 cm wide, 5-nerved; pistillate spikes 3-4 cm long; staminate spikes up to 2 cm long; bracts 3-4 mm long, teeth 19-21, narrowly triangular, acute; p. 33, fig. 10, p. 4
 Acalypha persimilis M. A.
- S. Plant perennial, densely hispid almost throughout; blades 5-10 cm long, 3-nerved; pistillate spikes dense, up to 5-9 cm long, subsessile; teeth of pistillate bracts 3, middle one acute, longer than others, lateral teeth truncate; styles purple-red; p. 36 Acalypha triloba M. A.

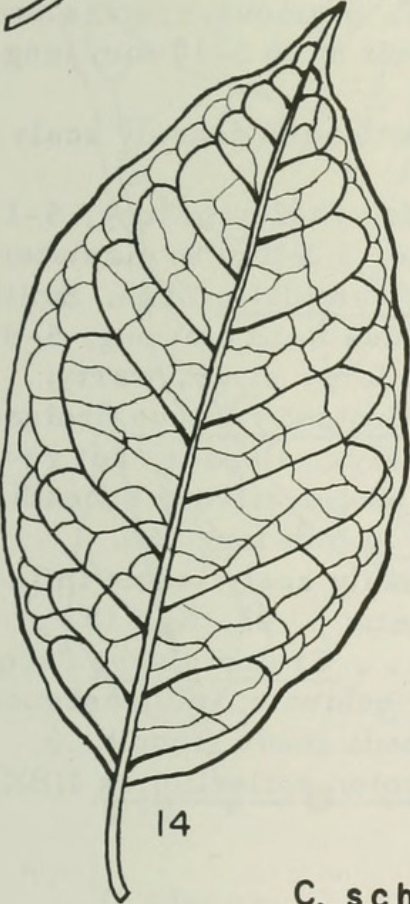
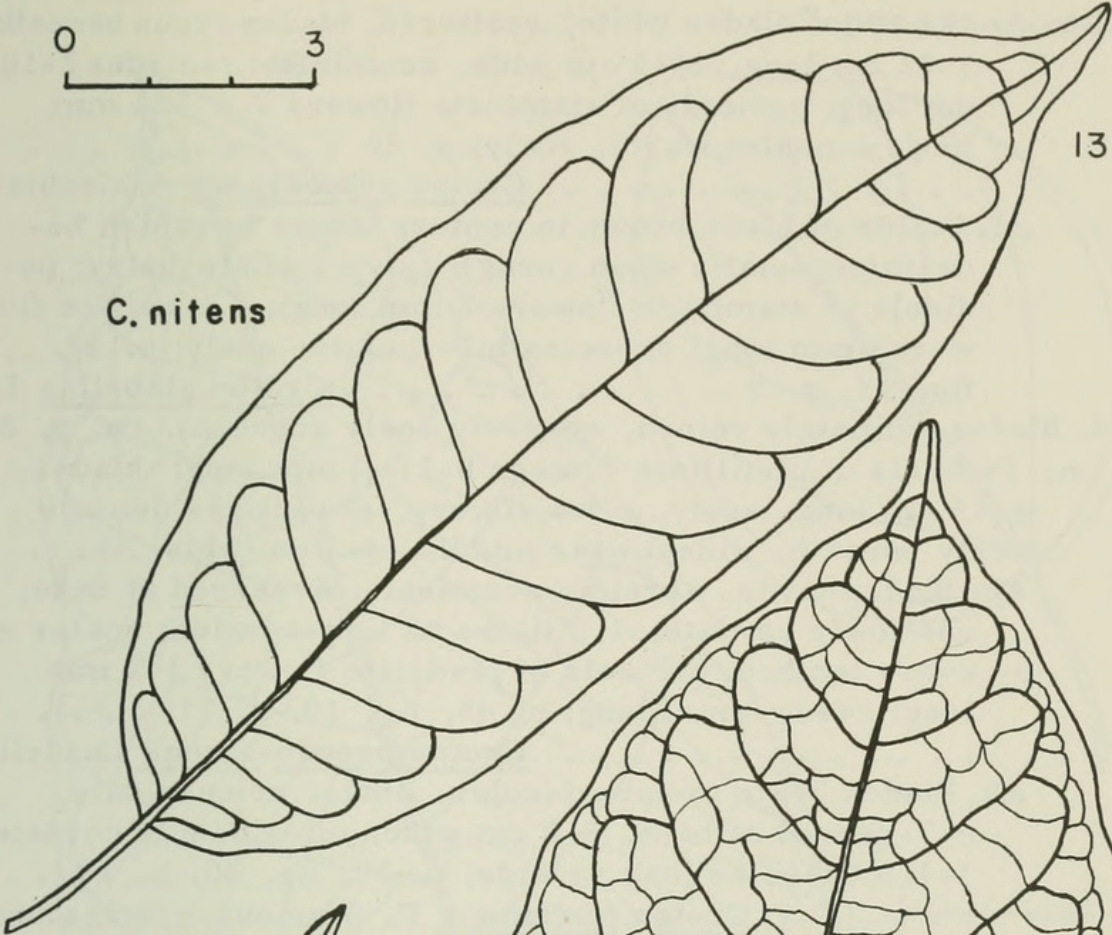


- L. Spikes bisexual or some spike pistillate only; blades 3-5-nerved at base T. cp. p. 3
- T. Spikes at bend of branches; glands on stipes, on base of blades; blades 6-8 cm long, 3.5-5 cm wide, short-cuspidate-acuminate, appressed-stellate beneath, 7-plinerved at base; glands top-shaped; spikes 9-12 cm long; p. 43 Croton ortholobus M. A.
- T. Spikes some of them axillary; blades crenulate or serrulate U.
- U. Pistillate bracts leaf-like, 6-12 mm wide; longest petioles 2.5-3 cm long; blades obtuse or acute; styles lacinulate; annual; p. 32 . Acalypha indica L.
- U. Pistillate bracts not leaf-like; styles 6-10-lacinulate V.
- V. Petioles 1-2 mm long; larger blades 2.5-4 cm long, 1-3 cm wide, obtuse or acute; terminal spikes 2-9 cm long; capsules 2 mm long; perennial; p. 34, fig. 12, p. 4 Acalypha phleoides Cav.
- V. Petioles 1-6 cm long; blades 4-7 cm long, 2-5.5 cm wide; larger spikes 4-5 cm long; bracts stipitate-glandular; annual or perennial; p. 31, fig. 11, p. 4 Acalypha guatemalensis P. & H.
- B. Plant woody, a tree or shrub; branches usually 3-5 mm thick near summit W. cp. p. 2
- W. Blades with scales, usually above, always beneath; scales minute, appressed, often dense, visible under high magnification, rarely stellate also X. cp. p. 12
- X. Inflorescences racemose-paniculate; blades 10-15 cm long; blades and branches stellate-tomentose and scaly; p. 40 Croton grosseri Pax
- X. Inflorescences not paniculate Y.
- Y. Blades 2-5 cm long, entire, usually obtuse, veins obscure; petioles without glands; pedicels 2-4 mm long; pistillate racemes about 1 cm long; p. 45 Croton punctatus Jacq.
- Y. Blades larger (5-)7-22 cm long, acute or acuminate, or almost obtuse Z.
- Z. Blades variously toothed, appressed-stellate-scaly above and beneath, later glabrate above; palmately veined; inflorescences some or all terminal; fruiting pedicels up to 5-10 mm long Aa.
- Aa. Blades 5-nerved at base, 8-14 cm long, 3.5-9 cm wide; petioles 3.5-5.5 cm long; racemes up to 15 cm long; p. 47 Croton simiarum S. & W.

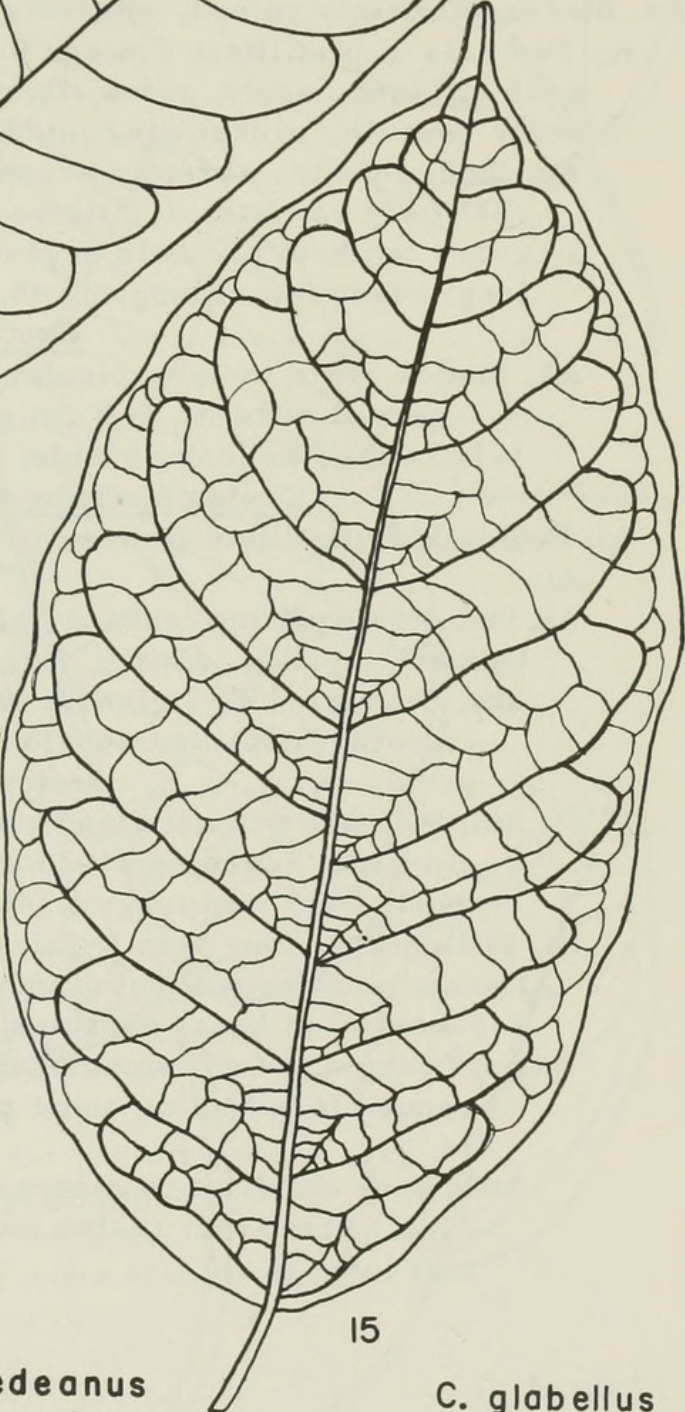
- Aa. Blades 3-nerved at base, dentate; petioles with 2 glands Ab.
- Ab. Petioles 5-8.5 (-13) cm long; blades coarsely irregularly toothed, 10-20 cm long, 9.5-17 cm side, pale beneath; staminate spikes 8-15 cm long, sparsely flowered; peduncles 1.5-5 cm long; p. 48; cp. p. 25
 Croton tonduzii Pax
- Ab. Petioles 1-3.5 cm long; blades rounded or blunt at tip, sparsely scaly above and beneath; ovaries and capsules stellate-scaly Ac.
- Ac. Racemes up to 20 cm long, on long peduncles; blades 7-11 cm long, 3-5 cm wide; pistillate flowers sessile; capsules 5-6 mm long; p. 42, fig. 17, p. 11
 Croton lundellii Standley
- Ac. Racemes up to 11.5 cm long; staminate flowers on pedicels; pistillate flowers unknown; blades 3-11 cm long, 1.4-4.7 cm wide, crenate-serrate, sparsely stellate-scaly; capsules 9 mm long; p. 44
 Croton petensis Lundell
- Z. Blades entire or nearly so Ad.
- Ad. Blades pinnately veined, glabrous or glabrate; petioles and blades without glands except in C. skutchii Ae. cp. p. 8
- Ae. Capsules about 35 mm long, smooth, scaly; seeds 20-22 mm long; pedicels 3.5-7 mm long; blades 8-16 cm long, 5-8 cm wide sparsely scaly; racemes mostly bisexual; anthers 1-1.2 mm long; p. 48 Croton tenuicaudatus Lundell
- Ae. Capsules 8 to about 13 mm long Af.
- Af. Inflorescences inisexual; capsules 8 mm long, scaly, subglobose; fruiting pedicels 9-11 mm long; blades 5-12 cm long, 4.5-6.5 cm wide, elliptic-oblong, not acuminate; p. 43, fig. 13, p. 9 . . Croton nitens Sw.
- Af. Inflorescences bisexual; flowers on pedicels; scales sparse or apparently absent from blades above Ag.
- Ag. Blades widely rounded or very obtuse at tip, 14.5-22 cm long, 9-18 cm wide; petioles 4-11 cm long, with 2 saucer-shaped, stipitate glands; pistillate pedicels 6-9 mm long; staminate flowers clustered along axis; p. 47
 Croton skutchii Standley
- Ag. Blades acute or acuminate; petioles 0.5-4 cm long, without glands; blades 7-22 cm long Ah.
- Ah. Blades often silvery beneath, 7-15 cm long, 2.8-3.5 cm wide, acuminate; racemes densely flowered; calyx of both sexes scaly; capsules scaly, about 8 mm long; p. 40
 Croton guatemalensis Lotsy
- Ah. Blades not silvery beneath Ai.



C. nitens



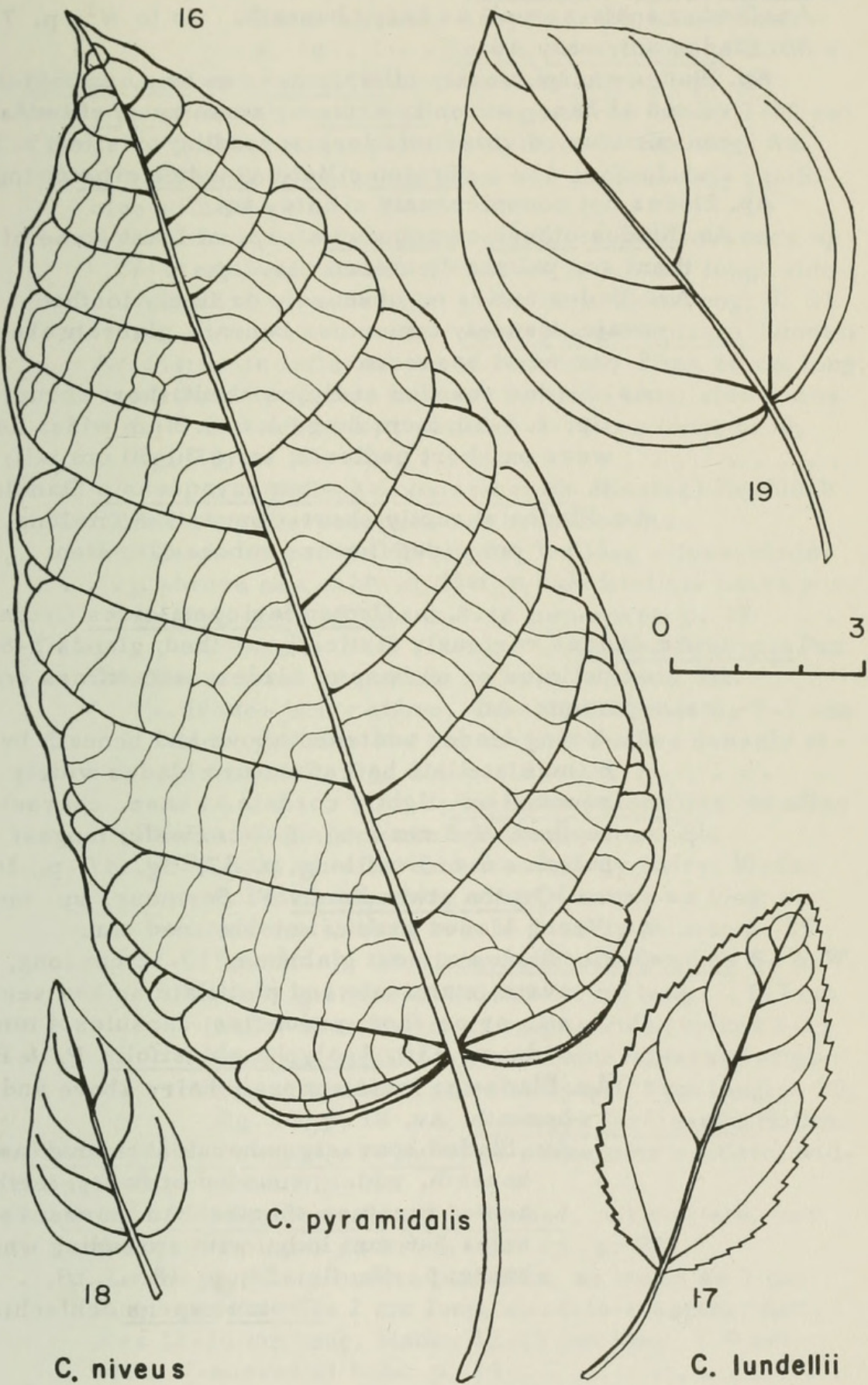
C. schiedeanus



C. glabellus

- Ai. Scales of blades white, scattered; blades green beneath, 7-22 cm long, 3-13 cm wide, acuminate; racemes 2-10 cm long; pedicels of staminate flowers 2.4-3.4 mm long; capsules warty, scaly; p. 46 Croton schiedeianus Schlechter
- Ai. Scales of blade brown in center; blades brownish beneath (especially when young); calyx stellate-hairy; pedicels of staminate flowers 2 mm long; of pistillate flowers 6 mm long; capsules tuberculate, scaly; p. 40, fig. 15, p. 9 Croton glabellus L.
- Ad. Blades palmately veined, sparsely scaly above Aj. cp. p. 8
- Aj. Pedicels of pistillate flowers 0-2(-3) mm long; blades 6-15 cm long, scaly, often silvery, sometimes densely scaly beneath, widest near middle, 4-9 cm wide Ak.
- Ak. Blades ovate, abruptly acuminate, 5-nerved at base, shallowly cordate, 1.5 times as long as wide; scales of ovary toothed; pedicels of pistillate flowers 1-2 mm long; seeds 5 mm long; p. 45, fig. 19. p. 11 Croton pseudo-niveus Lundell
- Ak. Blades ovate to suborbicular, obtuse or cuspidate, 5-7-nerved at base, 5-8 cm wide, often deeply cordate, 1-1.5 times as long as wide; p. 39, fig. 48, p. 19 Croton fantzianus F. Seymour, species nova
- Aj. Pedicels of pistillate flowers in fruit up to 5-10 mm long Al.
- Al. Pedicels equaling fruiting calyx; blades densely scaly beneath, usually silvery Am.
- Am. Petioles with 2 glands; blades 10-20 cm long, 5-13 cm wide; capsules subglobose, 5.5 mm in diameter; p. 45 Croton pyramidalis Donn. Smith
- Am. Petioles without glands; blades 8-12 cm long, 5-9 cm wide; capsules 21-23 mm long, scaly, warty; seeds 5-18 mm long; p. 46 Croton pyriticus Croizat
- Al. Pedicels shorter than fruiting calyx, slender, not reflexed; petioles without glands; blades silvery beneath; 3-5-nerved at base; capsules 9-10 mm long An.
- An. Ovary and fruit smooth, densely scaly; some inflorescences terminal on some plants; p. 43, fig. 18, p. 11 Croton niveus Jacq.
- An. Ovary and fruit muricate or echinate; inflorescence 2(-2.5) cm long; scales toothed; seeds smooth, 6 mm long; p. 46 Croton reflexifolius HBK.

C. pseudo-niveus



C. pyramidalis

C. niveus

C. lundellii

W. Blades hairy to glabrous Ao. cp. p. 7

Ao. Blades scaly as well as hairy beneath. Go to W¹, p. 7

Ao. Blades not scaly Ap.

Ap. Blades conspicuously ciliate, 3-6 cm long, palmately veined at base, abruptly acute or acuminate; stipules conspicuous, divided into long spreading bristles; p. 38

. Croton ciliato-glanduliferus Ortega

Ap. Blades not conspicuously ciliate Aq.

Aq. Blades obtuse or rounded at tip, at least some of them so, palmately veined Ar. cp. p. 13

Ar. Blades entire or obscurely or finely toothed, ovate, densely tomentose beneath, glabrate above, 5-nerved at base As.

As. Blades rounded at tip, without short abrupt tip, 2.5-10.5 cm long, 1.6-8.5 cm wide; flowers on short pedicels; stem 30-60 cm tall;

p. 44 Croton payaquensis Standley

As. Blades abruptly short-tipped, 5-8 cm long, 3.5-7 cm wide; flowers subsessile; stem

1-1.5 m tall; p. 42

. Croton lasiopetaloides Croizat

Ar. Blades variously distinctly toothed; glands 2-6 on petioles or on base of blades, sometimes conspicuous At.

At. Young blades whitened above and beneath by minute stellate hairs; mature blades widely rounded or slightly cordate at base, coarsely toothed, 7-8 cm long, 5-7 cm wide; longest petioles 6-6.5 cm long; p. 37, fig. 47, p. 26 . . Croton atwoodianus F. Seymour, sp. nov.

At. Young blades green, not whitened Au.

Au. Blades almost glabrous, 10-12 cm long, ovate; staminate and pistillate spikes sessile or on short peduncles; capsules 4 mm wide; p. 33 . Acalypha obtusifolia P. & H.

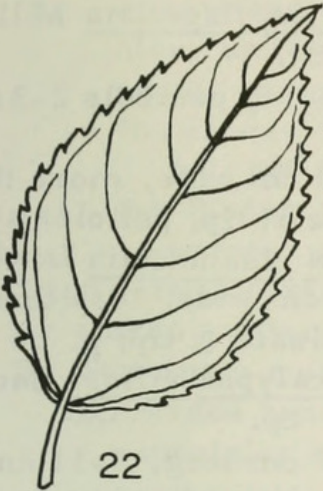
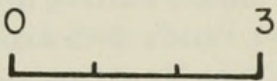
Au. Blades at least sparsely hairy above and beneath Av.

Av. Blades sparsely puberulent above and beneath, widely rounded at base; teeth acute; racemes shorter than leaves; capsules 5-6 mm long, with spreading white hairs; p. 46, fig. 24, p. 18

. Croton repens Schlechter

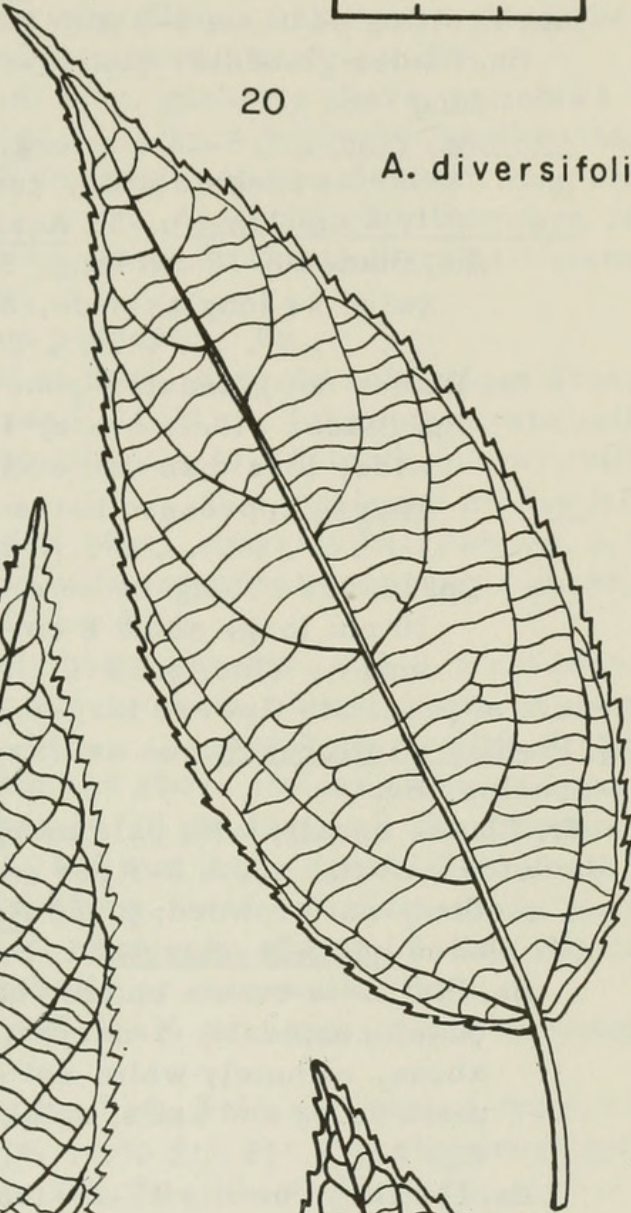
- Av. Blades densely stellate-pilose, widely cuneate at base, ashy beneath; teeth obtuse; p. 38 Croton ceanothifolius S. & W.
- Aq. Blades acute or acuminate or cuspidate Aw.cp. p. 12
- Aw. Blades gradually narrowed to long narrow base, 7-20 cm long, 2.5-10 cm wide; petioles up to 1-12 cm long Ax.
- Ax. Pistillate inflorescence branched paniculately; petioles without glands Ay.
- Ay. Inflorescences axillary; pistillate inflorescence up to 6 cm long; staminate spikes 3-6.5 cm long; side-veins 5-6 on each side; petioles 1-4 cm long; p. 31 Acalypha gummifera Lundell
- Ay. Pistillate inflorescences terminal, often 20 cm long; pistillate pedicels at least 1.5 mm long; side-veins 6-11 on each side; ; petioles 4-12 cm long; p. 30, fig. 29, p. 21 Acalypha costaricensis (Kuntze) Knobloch
- Ax. Pistillate inflorescences not branched Az.
- Az. Glands on petiole divergent, on long stipes; blades glabrous or nearly so in age, few stellate hairs persisting; teeth of blades 8-15 mm apart; p. 38 Croton brevipes Pax
- Az. Glands none on petiole or base of blade Ba.
- Ba. Blades hairy above, densely so beneath, 3-7 cm wide; petioles 1-4 cm long; branches densely pilose; p. 32, fig. 25, p. 18 Acalypha lancetillae Standley
- Ba. Blades glabrous to sparsely pilose Bb.
- Bb. Axis of inflorescence densely hairy; blades 1.3-2.5 cm wide, about 4 times as long as wide; pistillate bracts densely pilose; p. 29 fig. 26, p. 18 . Acalypha apodanthes S. & W.
- Bb. Axis glabrous; blades 8-18 cm long, 2, 5-7 cm wide, about thrice as long as wide; spikes 2-15 cm long; pistillate bracts puberulent and stipitate-glandular; petioles up to 1.5 cm long; p. 30, fig. 27, p. 18 . . Acalypha ferdinandii Hoffm.
- Aw. Blades at base abruptly rounded or cuneate or cordate, widest near base or middle Bc.
- Bc. Hairs of blades beneath not branched, not stellate, not dendritic, or blades glabrous Bd. cp. p. 20
- Bd. Lower pistillate bracts leaf-like, as much as 7 cm long, middle ones 1 cm long, cordate-clasping; petioles 12-16 cm long; blades 12-15 cm long, 7-9 cm wide, 7-nerved at base; p. 29 Acalypha chlorocardia Standley

- Bd. Lower and other bracts not leaf-like, smaller Be,
 Be. Blades pinnately veined at base Bf.
 Ef. Staminate spikes sessile or subsessile, 5-11 cm long; blades velutinous or glabrate; young branches villous or appressed-pilose or glabrate; p. 30
 Acalypha diversifolia Jacq.
 Bf. Staminate spikes on peduncles; blades tomentose and hispid; young branches with long villous hairs; p. 39 .
 Croton costaricensis Pax
 Be. Blades palmately veined; spikes unisexual Bg.
 g. Pistillate bracts few, 1-7, usually 1-2; blades toothed Bh.
 Bh. Pistillate spikes sessile; pistillate bracts 3-7, rarely 1-2; blades 3-8 cm long, soft-pilose above and beneath, or pilose above on veins only; petioles 1-2 cm long; staminate spikes 1-2.5 cm long, sessile; p. 30, fig. 21, p. 15
 Acalypha euphrasio-stachys Bartlett
 Bh. Pistillate spikes on long filiform peduncles; pistillate bracts 1(-2) Bi.
 Bi. Staminate spikes 3-6 cm long; blades 4-10 cm long, 3-nerved at base, pinnately nerved above, teeth 3-5 per cm; petioles 1-6 cm long; pistillate bracts 13-17-toothed; p. 32
 Acalypha leptopoda M. A.
 Bi. Staminate spikes 1-1.5 cm long; blades 2-5(-9) cm long, 5-nerved at base, teeth 4-5 per cm; petioles long or short; pistillate bracts 9-11-toothed; p. 36 Acalypha unibracteata M. A.
 Bg. Pistillate bracts many; staminate spikes sessile or subsessile Bj.
 Bj. Pistillate bracts in dense subglobose heads; heads on long peduncles; fruiting bracts 10-15 mm long; blades coarsely toothed, 5-nerved at base, 5-14 cm long, villous; p. 36 Acalypha trachyloba M. A.
 Bj. Pistillate bracts not in dense heads Bk.
 Bk. Bracts of pistillate flowers minute or scarcely 4 mm long Bl.
 Bl. Pistillate flowers dense; staminate flowers in clusters; blades 5-9 cm long, 2-4 cm wide, 3-nerved at base; spikes 4-5 cm long; petioles 0.7-3.5 cm long; p. 31, fig. 28, p. 18 . . .
 Acalypha garnieri S. & W.
 Bl. Flowers distant; pistillate spikes sparsely flowered Bm.



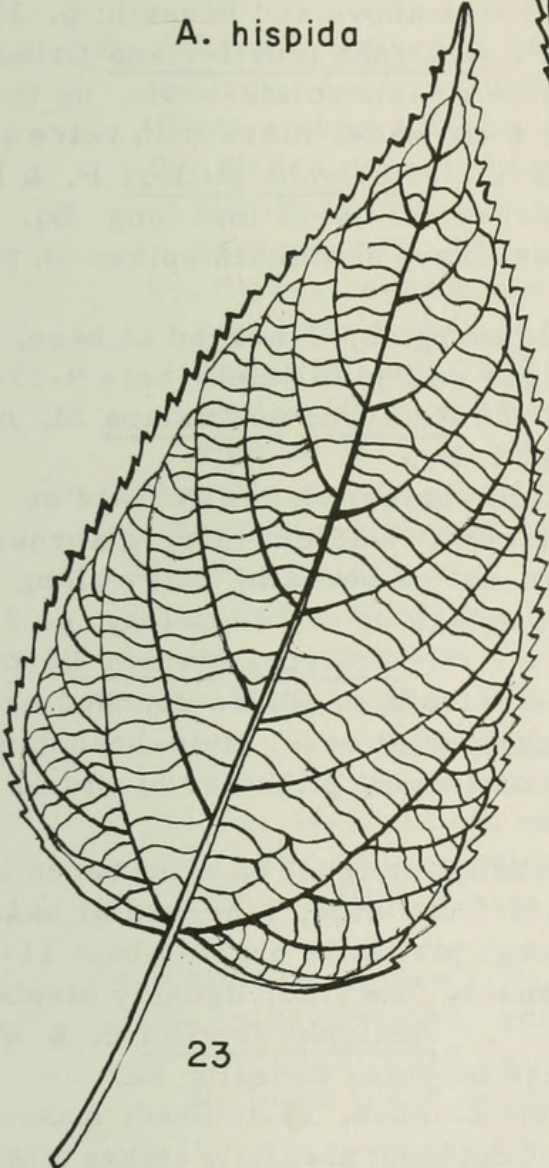
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A. hispida



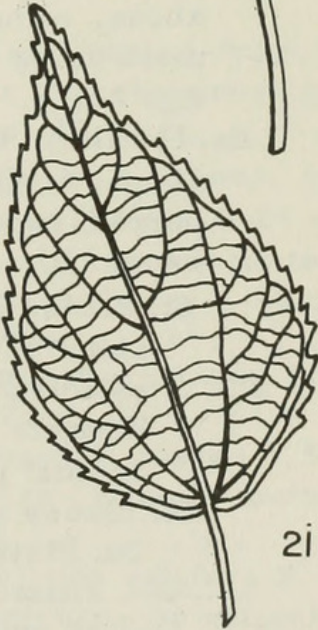
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A. diversifolia



23

A. tenuicauda



21

A. euphrasio-stachys

Bm. Fruiting pedicels 8-12 mm long, 5-8 mm apart; petioles 3-5 cm long; p. 31 . . . Acalypha flagellata Millsp.

Bm. Fruiting pedicels 1-3 mm long Bn.

Bn. Blades glandular-punctate; fruiting pedicels 2-3 mm long Bo.

Bo. Blades 7.5-22 cm long, 2-8 cm wide, more than twice as long as wide, caudate at tip; petioles usually 2 cm long; p. 33 Acalypha oblancifolia Lundell

Bo. Blades 8-18 cm long, 5-12 cm wide, less than twice as long as wide, acuminate at tip; p. 36 Acalypha villosa Jacq.

Bn. Blades not glandular-punctate Bp.

Bp. Blades widely ovate, 11-17 cm long, 7-11 cm wide, less than twice as long as wide, with long sparse appressed hairs above and beneath; p. 33 Acalypha muelleriana Urban

Bp. Blades oblong-ovate or lanceolate-ovate, up to 20 cm long, about 8 cm wide, more than twice as long as wide; p. 34 . . . Acalypha pittieri P. & H.

Bl. Bracts of pistillate flowers larger, (3-)4-15 mm long Bq.

Bq. Pistillate inflorescences axillary; staminate spikes on peduncles Br.

Br. Blades usually with pale margins, 3-nerved at base, widely ovate, teeth 2-3 per cm; pistillate bracts 9-13-toothed, not crowded; p. 36 Acalypha wilkesiana M. A.

Br. Blades not pale-margined Bs.

Bs. Pistillate bracts entire, hairy; blades cuneate at base, cuspidate, 3-nerved, 9-15 cm long, glabrous above, minutely white-dotted beneath, hairy along main veins and axils; spikes up to 30 cm long; p. 31, fig. 22, p. 15 Acalypha hispida Burm.

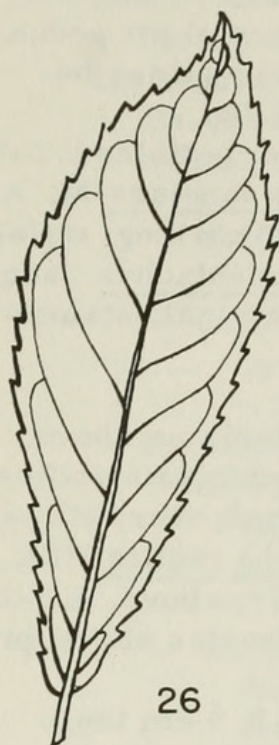
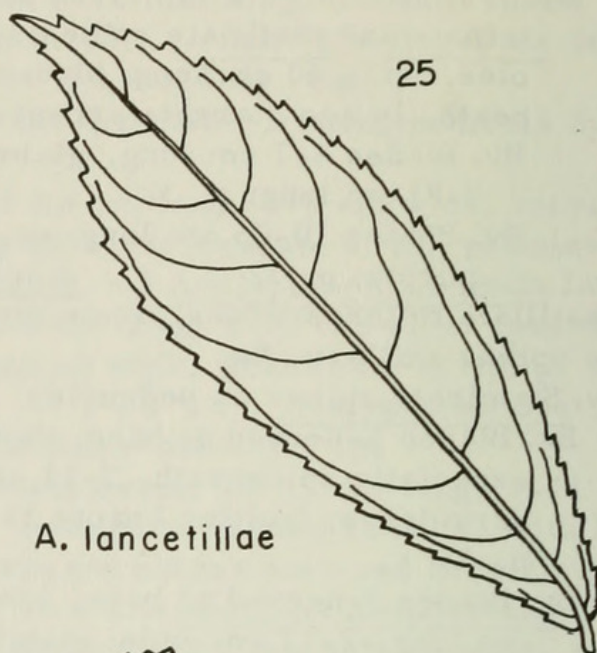
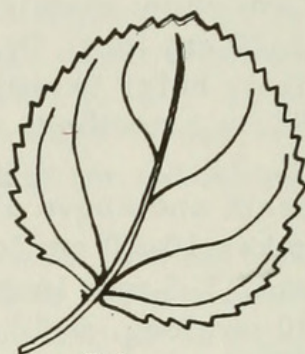
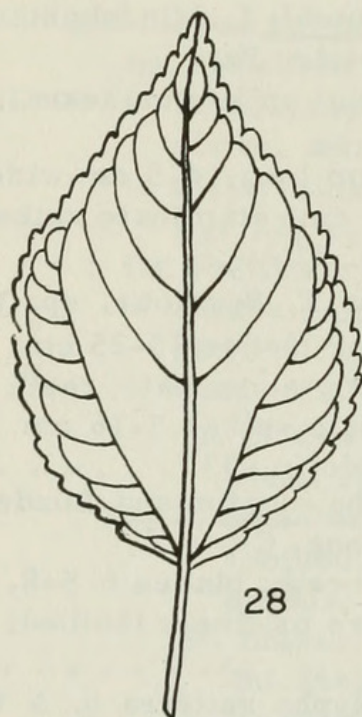
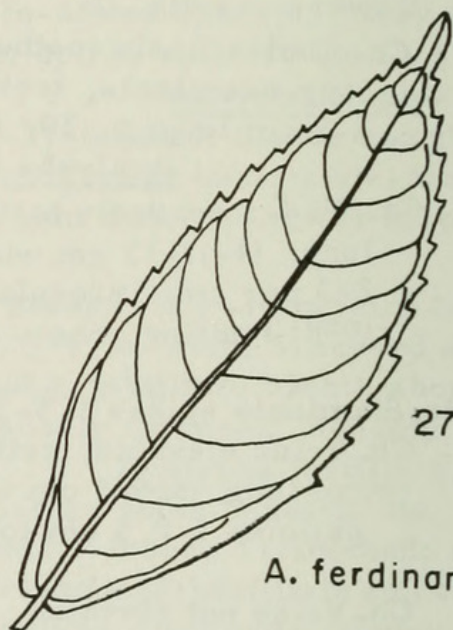
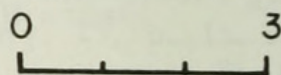
Bs. Pistillate bracts 11-27-toothed; blades rounded or obtuse or shallowly cordate at base; style-branches purple; capsules 2-4 mm wide, pilose or hispid or warty Bt.

Bt. Blades glabrous except strigose on veins beneath, about 12 cm long, 5-6 cm wide, 3-nerved at base; petioles 5-8 cm long; pistillate bracts about 11-toothed; spikes densely flowered, densely hispidulous; p. 31 Acalypha fertilis S. & W.

Bt. Blades not strigose on veins beneath Bu.

Bu. Pistillate bracts 2-lobed, 11-toothed; staminate spikes 5-6 cm long; pistillate spikes often 15 cm long; capsules 2 mm wide; blades glabrous or nearly so; p. 36, fig. 23, p. 15 Acalypha tenuicauda P. & H.

- Bu. Pistillate bracts (5-)11-22-toothed, not 2-lobed; staminate and pistillate spikes sessile or on short peduncles, up to 40 cm long; blades velutinous-pilose beneath, in age glabrate except on veins Bv.
- Bv. Blades 4-7 cm long, glabrate above; petioles 1.5-5 (-8) cm long; p. 32 Acalypha langiana M. A.
- Bv. Blades 10-25 cm long; petioles 5-25 cm long; styles purple; p. 32 Acalypha macrostachya Jacq.
- Bq. Pistillate inflorescences, some of them, terminal; staminate spikes axillary Bw.
- Bw. Staminate spikes on peduncles Bx.
- Bx. Blades 5-nerved at base, densely soft-pilose above, especially so beneath, 7-11 cm long; staminate spikes very dense; fruiting bracts 11-15-toothed; ovary villous; p. 33 Acalypha mollis HBK.
- Bx. Blades 3-nerved at base, sparsely hairy above, 4.5-20 cm long, 2-12 cm wide; staminate peduncles short; pistillate spikes 3-20 cm long By.
- By. Blades densely hairy beneath, 4.5-8.5 cm long; pistillate bracts 5-toothed, obtuse; hairs of stem spreading; p. 34 Acalypha porcina S. & W.
- By. Blades beneath and above almost glabrous in age; pistillate spikes 10-20 cm long, on short peduncles; bracts distant, 3-5 mm long, deeply 7-11-toothed; blades 10-20 cm long, 3-12 cm wide; styles purple-red; p. 35 . . . Acalypha skutchii I. M. Johnston
- Bw. Staminate spikes sessile or subsessile Bz.
- Bz. Staminate spikes (5-)6-16 cm long; spikes unisexual; flowers sessile Ca.
- Ca. Blades finely toothed, 8-11 cm long, 4-5 cm wide, long-acuminate, teeth 4-6 per cm; staminate spikes 6-8 cm long; p. 29, fig. 30, p. 21
. Acalypha chordantha F. Seymour, sp. n.
- Ca. Blades coarsely toothed; larger blades 10-25 cm long, (4-)7-13 cm wide, abruptly acuminate; teeth 2-3 per cm, irregular; staminate spikes 5-16 cm long; fruiting bracts 16 mm wide; p. 33
. Acalypha mortoniana Lundell
- Bz. Staminate spikes 1.5-3(-5) cm long Cb.
- Cb. Veins elevated, reticulate beneath; blades 6.5-8.5 cm long, 3.5-5 cm wide, entire or finely toothed; petioles 1-2.5 cm long; p. 35
. Acalypha retifera S. & W.
- Cb. Veins not elevated, not conspicuous or reticulate; blades finely toothed Cc.

*A. apodanthes**A. lancetillae**C. repens**A. garnieri**A. ferdinandii*

Cc. Pistillate flowers dense; pistillate spikes 3-10 cm long, on peduncles; staminate spikes up to 3 cm long, almost sessile; young petioles with soft spreading hairs; blades 5-13 cm long, cordate; fruiting bracts 5-10 mm wide; p. 35, fig. 31, p. 21

..... Acalypha schiedeana Schlechter

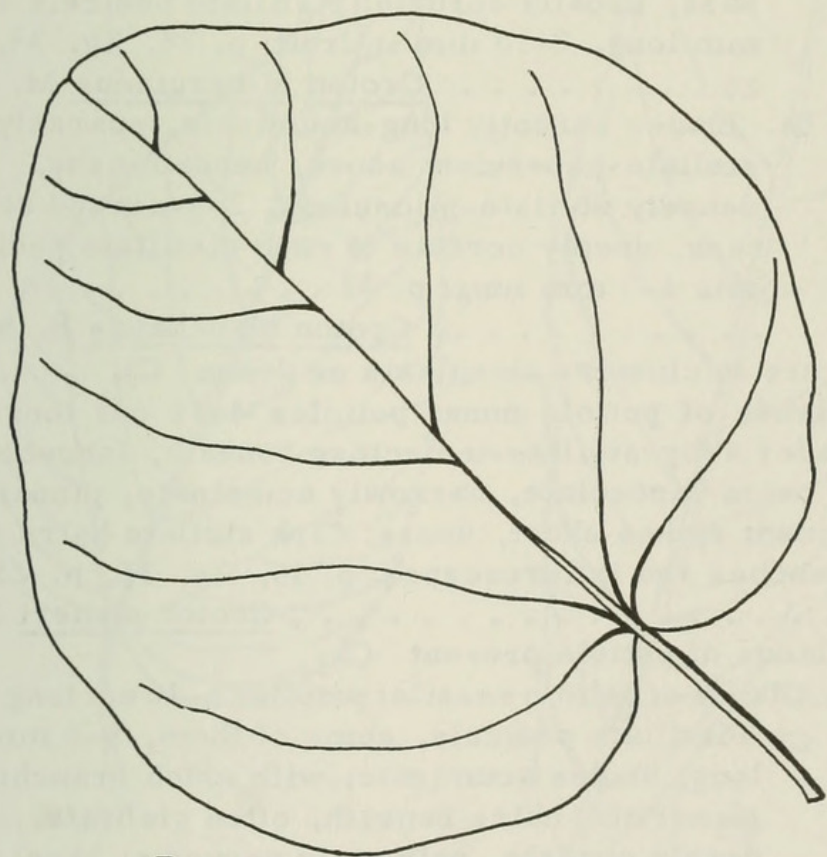
Cc. Pistillate flowers remote or spikes interrupted; fruiting bracts 3 mm long; styles purple-red; blades commonly 4-5 cm long Cd.

Cd. Pistillate spikes on short peduncles; young branches with dense long white spreading hairs; petioles 0.7-3.5 cm long, densely spreading pilose; axis of spikes with short dense spreading hairs; blades definitely cordate, 2.5-8 cm long; p. 34

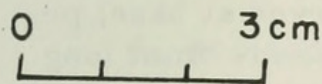
..... Acalypha porphyrantha Standley

Cd. Pistillate spikes almost sessile; young branches spreading-pilose or almost glabrous; petioles 1-7 cm long, sparsely spreading-pilose; blades slightly cordate, 3-11 cm long; p. 31

..... Acalypha firmula M. A.



48



C. fanfzianus

Bc. Hairs of blades beneath branched, some stellate or dendritic; blades hairy to glabrous above Ce. cp. p. 13

Ce. Longest petioles 5-20 cm long; blades palmately veined at base Cf. cp. p. 24

Cf. Flowers distinct, not in clusters Cg.

Cg. Glands on petiole none or obscure; blades sparsely minutely puberulent above with brown hairs, 10-20 cm long, 5-12 cm wide, long-acuminate; racemes 15-20 cm long; pedicels 2-4 mm long; capsules densely minutely tomentose; p. 41, fig. 39, p. 26

. Croton jimenezii Standley & Valerio

Cg. Glands 2 or more, saucer-shaped, on petiole near base of blade Ch.

Ch. Blades gradually acuminate, suborbicular, deeply cordate (2.5 cm), 21 cm long, 19 cm wide, 7-nerved at base; hairs dark, stellate; blades hairy on midrib above, on veins beneath; petioles 12 cm long; p. 41 Croton hoffmannii M. A.

Ch. Blades abruptly acuminate; glands of petiole sessile Ci.

Ci. Blades abruptly short-acuminate, glabrate above, stellate-hairy beneath, 7-9-nerved at base, usually cordate; pistillate pedicels 3-5 mm long, 7-10 mm in fruit; p. 38, fig. 39, p. 26 Croton bilbergianus M. A.

Ci. Blades abruptly long-acuminate, sparsely stellate-puberulent above, beneath ashy, densely stellate-pilosulous, 3-5-nerved at base, deeply cordate (4 cm); pistillate pedicels 4-8 mm long; p. 38 Croton olanchanus S. & W.

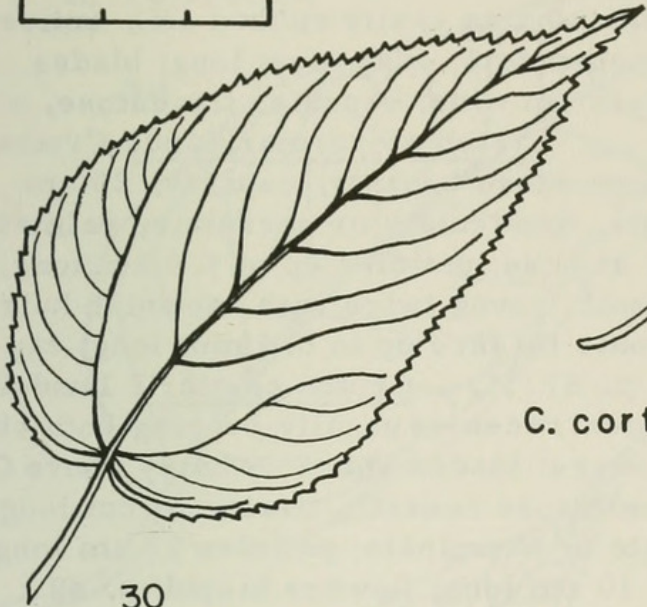
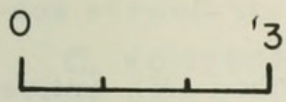
Cf. Flowers in clusters along axis or dense Cj.

Cj. Glands of petiole none; petioles 4-11 cm long; blades ashy-stellate-tomentose beneath, lanceolate or ovate-lanceolate, narrowly acuminate, pinnately veined; spikes short, dense; dark stellate hairs on branches and inflorescence; p. 45, fig. 35, p. 23 Croton pittieri Pax

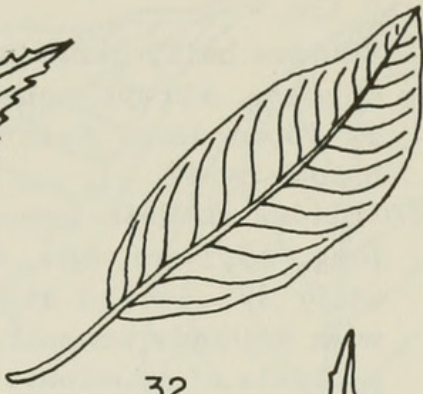
Cj. Glands of petiole present Ck.

Ck. Glands of petiole sessile; petioles 6-16 cm long Cl.

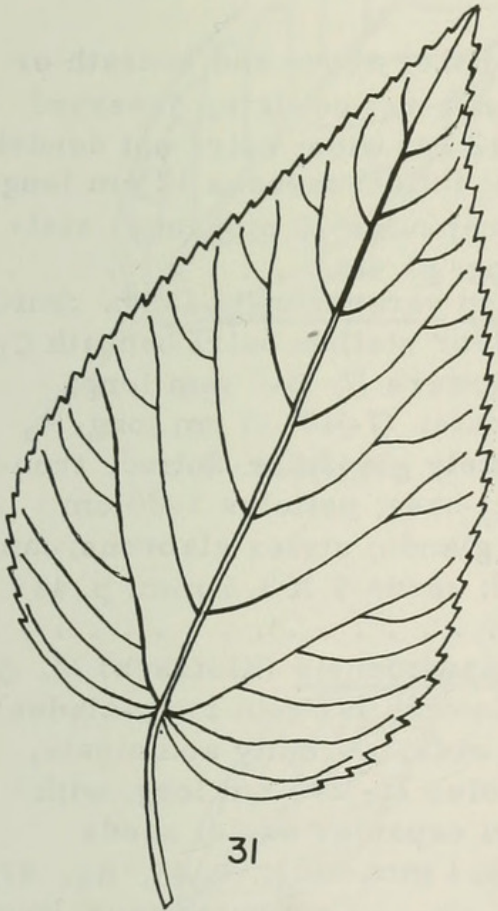
Cl. Pistillate pedicels, some of them, 5-6 mm long; blades acuminate, with much branched (dendritic) hairs beneath, often glabrate, deeply cordate, palmately nerved at base; petioles with 2-3 large glands; seeds 3mm long and wide; p. 38 . . Croton callistanthus Croizat



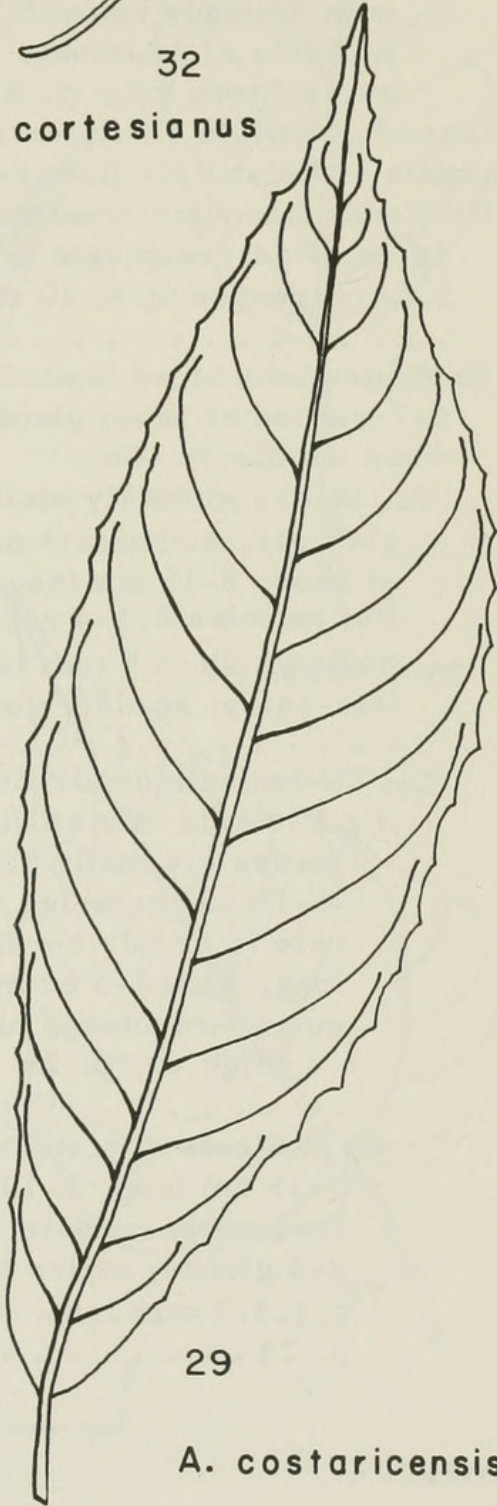
A. chordantha



C. cortesianus



A. schiedeana



A. costaricensis

Cl. Pistillate pedicels less than 1 mm long, or flowers sessile Cm.

Cm. Blades hairy beneath (hairs easily rubbed off), entire, cordate, abruptly cuspidate; cusp 1 cm long; blades 10-15 cm long, 8-12 cm wide; capsules tomentose, not hispid; p. 47 Croton steyermarkianus Croizat

Cm. Blades stellate-tomentose beneath, caudate, 25 cm long, 15.5 cm wide, denticulate or serrulate, palmately 3-5-nerved at base; petioles up to 7.5 cm long, with 4 glands beneath; young twigs with brownish hairs; pedicels of staminate flowers up to 6.5 mm long; capsules 7 mm long; p. 37 . . . Croton aguilarii Lundell

Ck. Glands of petiole on stipes; racemes usually bearing both staminate and pistillate flowers; blades sparsely hairy above Cn.

Cn. Blades flocculent-tomentose beneath, ovate, 17 cm long, 10 cm wide, cuspidate or acuminate; petioles 13 cm long; inflorescences up to 10 cm long; flowers hispid; p. 48 Croton triumfettoides Croizat

Cn. Blades tomentose beneath with stellate or dendritic hairs, 5-7-nerved at base; glands of petiole saucer-shaped; flowers not hispid Co.

Co. Blades minutely stellate-hairy above and beneath or glabrate, acuminate or acute, not cordate, 5-nerved at base, 8-16 cm long, 7-12 cm wide; hairs not dendritic; petioles 2.5-4 cm long; inflorescences 12 cm long; pedicels up to 5 mm long; capsules 10 mm long, stellate-hairy; seeds 5 mm long; p. 48 Croton verapazensis Donn. Smith

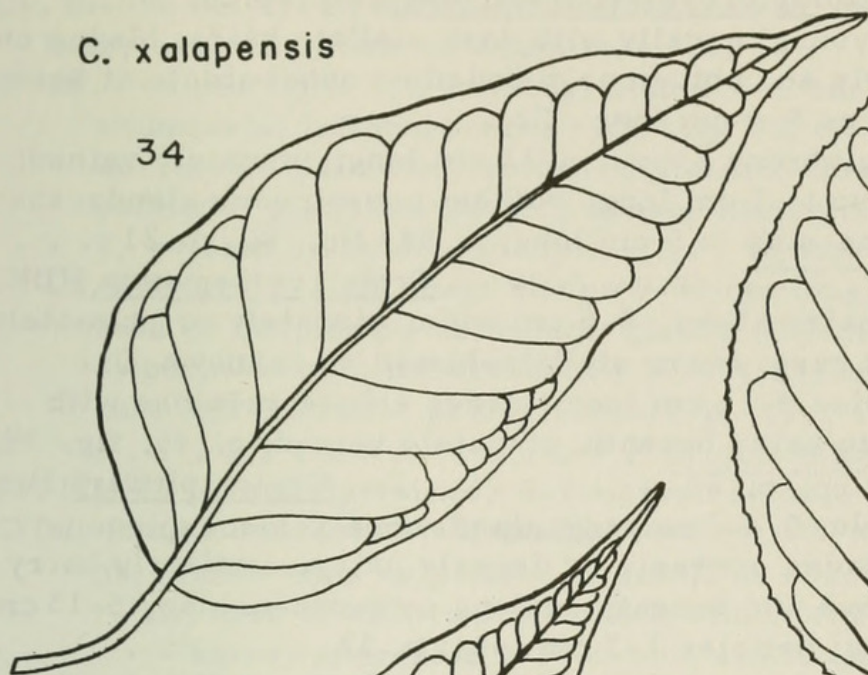
Co. Blades with dendritic and/or stellate hairs beneath Cp.

Cp. Pedicels of pistillate flowers (2-)3-6 mm long; blades gradually acuminate, (7-)10-30 cm long, (6-)7-23 cm wide, minutely glandular-dotted, truncate to deeply cordate at base; petioles 3-20 cm long, with 2-6 or more glands; styles glabrous; capsules tomentose, hispid; seeds 5 X 3.5 mm; p. 44 fig. 40, p. 26 Croton panamensis (Klotzsch) M. A.

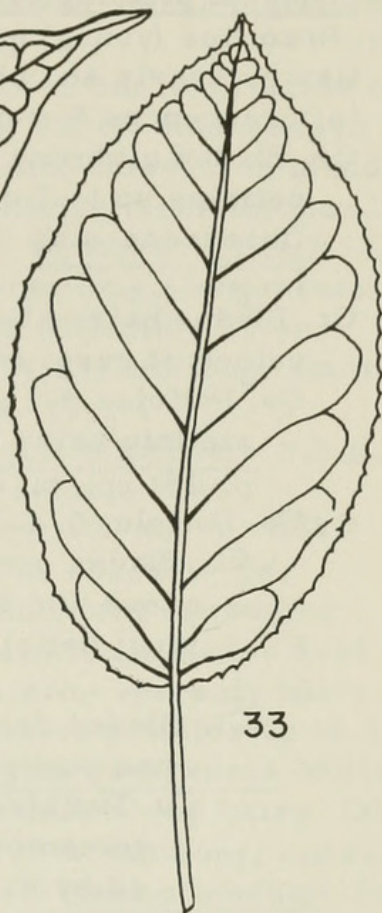
Cp. Pedicels of pistillate flowers 1-2 mm long; blades 5-15 cm long, 2-10 cm wide, abruptly acuminate, frequently cordate; petioles (1-)2-6 cm long, with 2-4 glands; styles hairy; capsules ovoid; seeds 5.1-5.7 mm long, 3.6-4.1 mm wide; p. 45, fig. 47, p. 23 Croton pungens Jacq.

C. xalapensis

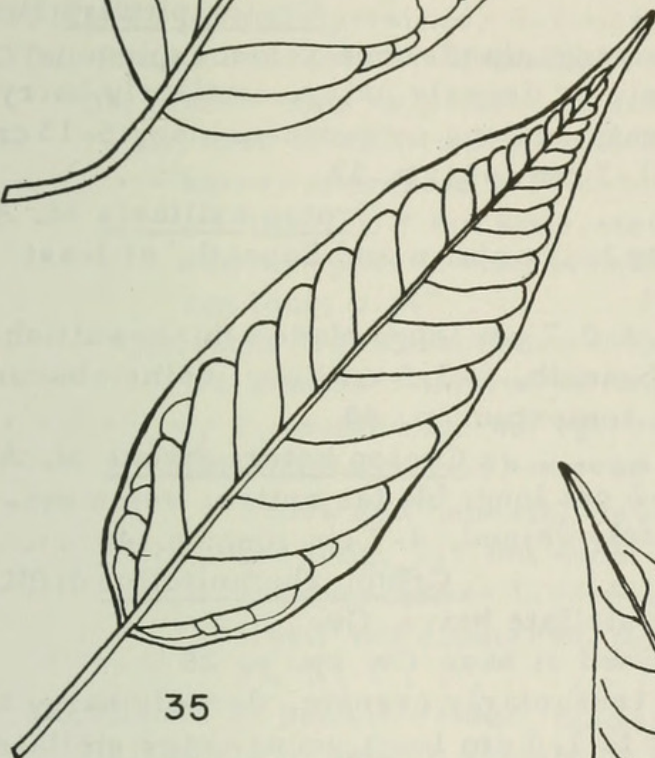
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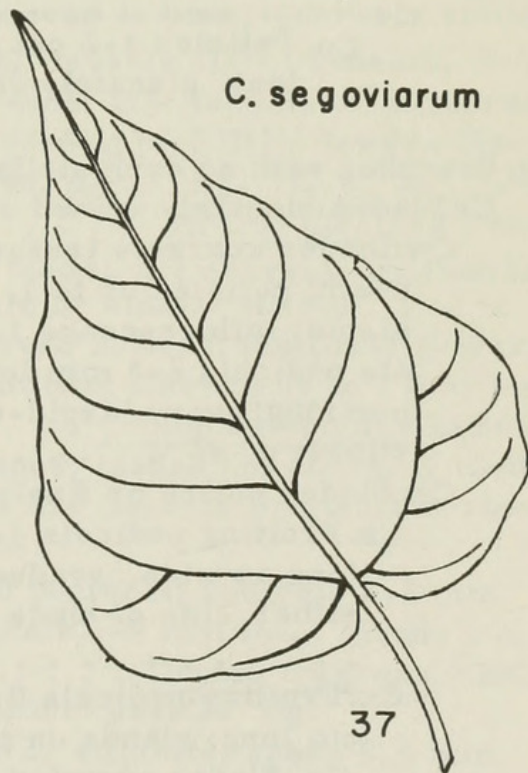
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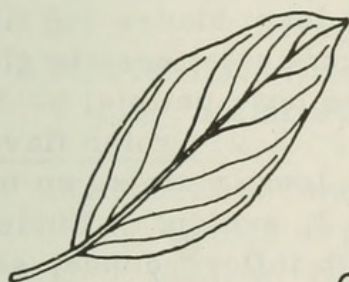
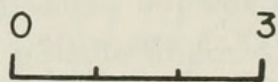
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*C. pittieri**C. segoviarum*

37



36

*C. pluvialis**C. pungens*

Ce. Longest petioles 0.6-6(-6.5) cm long Cq. cp. p. 20

Cq. Branches (young) usually with dark stellate hairs; blades entire or nearly so, obtuse or rounded or subcordate at base; inflorescences 5-6 cm long Cr.

Cr. Blades glabrous above, 4-12 cm long, pinnately veined; petioles up to 3 cm long, without conspicuous glands; inflorescences up to 5 cm long; p. 38, fig. 32, p. 21 . . .
 Croton cortesianus HBK.

Cr. Blades hairy above, 2-6 cm wide, pinnately or palmately veined at base; ovary stellate-hispid or unknown Cs.

Cs. Petioles 4-11 cm long; blades ashy-tomentose with stellate hairs beneath, pinnately veined; p. 45, fig. 35, p. 23; cp. p. 20 Croton pittieri Pax

Cr.Cs. Petioles 0.4-3 cm long; glands none or inconspicuous Ct.

Ct. Blades sparsely or densely hairy, similarly hairy above and beneath, oblong or ovate-oblong, 5-13 cm long; petioles 1-3 cm long; p. 37
 Croton axillaris M. A.

Ct. Blades densely hairy above and beneath, at least when young Cu.

Cu. Petioles 0.4-0.7 cm long; blades thick-whitish-tomentose beneath, 2-3.5 cm long; veins obscured by dense tomentum; p. 40
 Croton heterochrous M. A.

Cu. Petioles 1-2 cm long; blades entire, veins evident, pinnately veined, 4-7 cm long; p. 46 . . .
 Croton rhamnifolius HBK.

Cq. Branches with no dark stellate hairs Cv.

Cv. Blades pinnately veined at base Cw. cp. p. 25

Cw. Blades coarsely irregularly crenate, densely hairy beneath; petioles up to 1.5 cm long; young twigs stellate-hispid; inflorescence 1.5-7 cm long, bisexual; staminate pedicels 2-3 mm long; pistillate pedicels none to 1 mm long; ovary hispid-tomentose; glands of petiole on stipes; p. 42 Croton jutiapensis S. & W.

Cw. Blades entire or finely serrate Cx.

Cx. Fruiting pedicels 3-5 mm long; blades 3-5 times as long as wide, gradually acuminate; sessile gland at either side of blade at base near petiole; p. 39 . . .
 Croton flavens L.

Cx. Fruiting pedicels 0-1 mm long; petioles up to 1-3 cm long; glands on petiole 2, evident or hidden Cy.

Cy. Blades crowded beneath inflorescence, serrulate, 1.5-2.5 cm wide, less than 3 times as long as wide; glands cylindric, often hidden, not widened at tip; pistillate flowers crowded at base of inflorescence; p. 37 . . . Croton adspersus Bth.

Cy. Blades not crowded beneath inflorescence, densely stellate-hairy beneath, acute or acuminate Cz.

Cz. Petioles up to 1.5 cm long; blades 3-5 cm long, acute or acuminate; inflorescences typically 7-8 cm long; entire or serrulate, palmately veined; staminate flowers on slender pedicels; pistillate flowers dense, almost sessile; glands 2, evident or hidden; p. 39 Croton fragilis HBK.

Cz. Petioles 2-3 cm long; blades 9-20 cm long, long-acuminate or cuspidate, serrulate; glands of petiole 2, on stipes, evident; inflorescence 10-20(-25) cm long; staminate and pistillate pedicels short; p. 49
. Croton xalapensis H.B.K.

Cv. Blades palmately veined, 3-7-nerved at base Da.

Da. Blades coarsely or distinctly toothed Db. cp. p. 27

Db. Glands none on petiole or small or obscure Dc.

Dc. Axis of inflorescence with dense long spreading hairs; staminate part up to 8 cm long; blades 5-11 cm long, 3-7 cm wide, acuminate, sparsely hairy above; upper leaves sessile; lower petioles up to 4 cm long; p. 47 Croton suyapensis Molina

Dc. Axis of inflorescence without dense long hairs Dd.

Dd. Blades 3-nerved at base, 10-15 cm long, coarsely toothed; p. 48; cp. p. 8 . Croton tonduzii Pax

Dd. Blades 5-7(-9)-nerved at base, sparsely stellate above and beneath, densely dotted beneath, 5-11 cm long, 2-7 cm wide; glands none or obscure; inflorescences bisexual; pistillate flowers distinct, not clustered; p. 41, fig. 38, p. 26 . . .
. Croton hircinus Vent.

Db. Glands on petiole evident; blades not coarsely toothed De.

De. Glands of petiole sessile or almost sessile, 2 or 4; blades caudate, 3-5-nerved at base; pistillate flowers sessile; pedicels of staminate flowers up to 7 mm long; p. 37 Croton asteroides Lundell

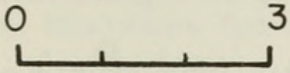
De. Glands of petiole on stipes; blades not coarsely toothed, stellate-hairy above and beneath or glabrate above Df.

Df. Pistillate flowers on pedicels; pedicels 2-3 mm long; staminate pedicels 6-9 mm long; glands 2-6; p. 40 Croton fragrans HBK.

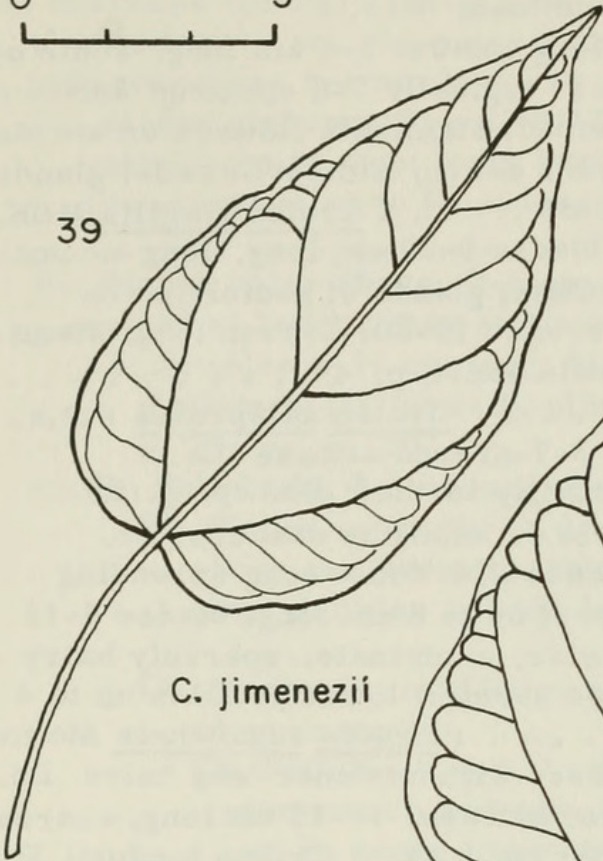
Df. Pistillate flowers almost sessile Dg.

Dg. Glands of petiole 2, stipitate; seeds 5.5 mm long; p. 41 Croton jalapensis Croizat

Dg. Glands of petiole about 4, patelliform; seeds 10 mm long; p. 46 . . Croton quercetorum Croizat

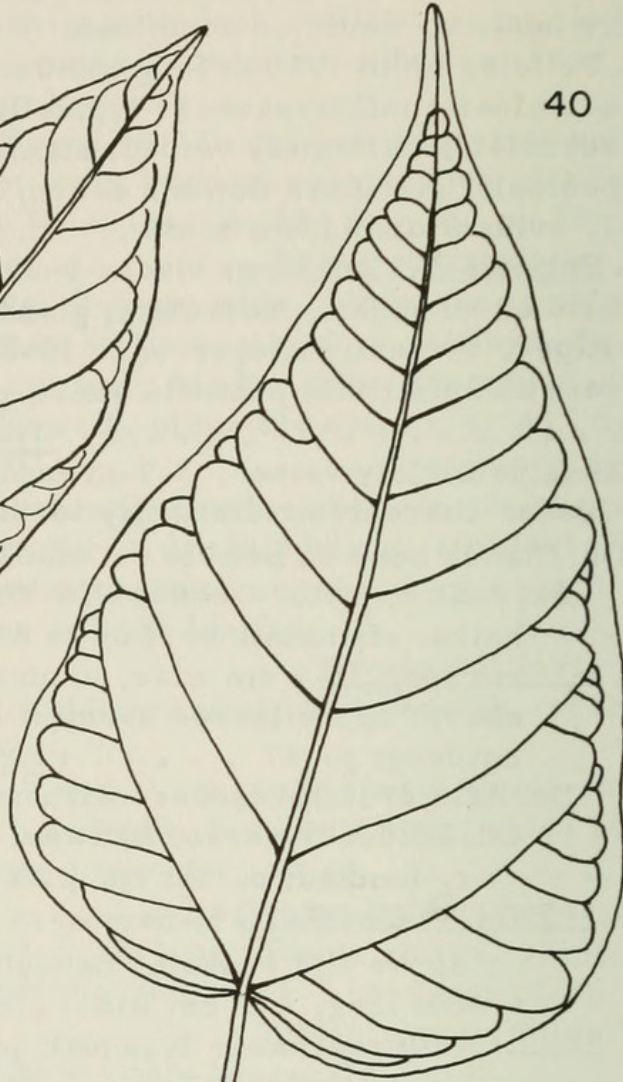


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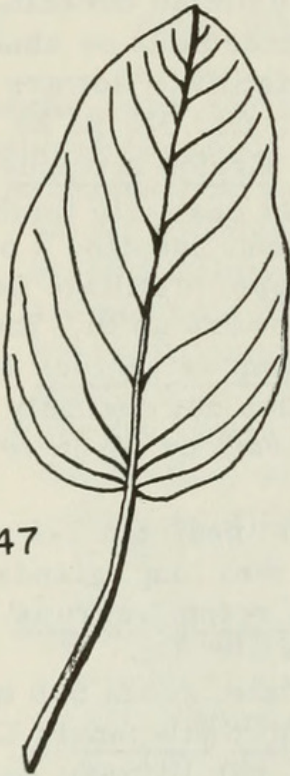
C. jimenezii

40



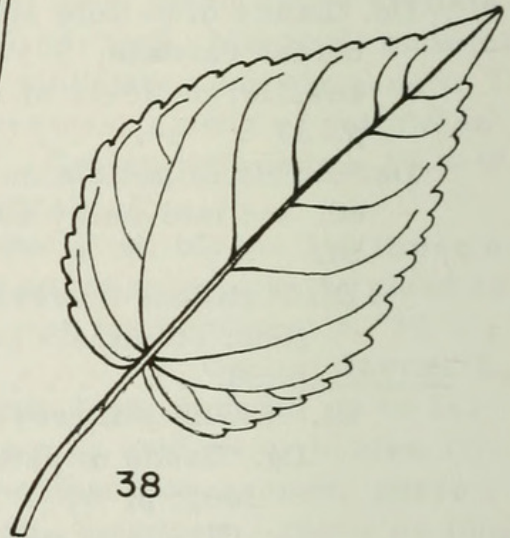
C. panamensis

47



C. atwoodianus

38



C. hircinus

Da. Blades entire to finely toothed Dh. cp. p. 25

Dh. Pistillate flowers sessile or nearly so Di.

Di. Hairs of blades beneath, some of them, dendritic Dj.

Dj. Pedicels of staminate flowers 3-8 mm long; fruiting pedicels 1-2 mm long; glands of petiole 2-4; lower nodes of inflorescence with both staminate and pistillate flowers; styles once divided; p. 45, fig. 37, p. 23 Croton pungens Jacq.

Dj. Pedicels of staminate flowers 6-9 mm long; pistillate pedicels 2-3 mm long; glands 2-6, stipitate, patelliform; lower nodes of inflorescence with only pistillate flowers; styles 2-4 times divided; p. 40 Croton fragrans HBK.

Di. Hairs of blades beneath stellate, dense, not dendritic; blades acute or short-acuminate or caudate; petioles bearing 2 conspicuous stipitate glands; staminate flowers on short pedicels; pistillate flowers almost sessile Dk.

Dk. Sepals of pistillate flowers 3.5 mm long; pistillate flowers distinct not in clusters; racemes 10-20 (-25) cm long; blades 9-20 cm long, rounded and cordate at base, pinnately veined but basal nerves conspicuous; p. 49 Croton xalapensis Croizat

Dk. Sepals of pistillate flowers 1.5 mm long; pistillate and staminate flowers in clusters or distinct; racemes up to 13 cm long, on peduncles; blades 6-12 cm long, 3-7 cm wide, rounded and cordate and 5-nerved at base; p. 44 . Croton pagiveteris Croizat

Dh. Pistillate flowers, some of them, on pedicels, distinct, not in clusters; pistillate pedicels at least 2-3 mm long; racemes bisexual or staminate Dl.

Dl. Racemes 10-20 cm long; glands of petiole hidden; blades 4-9.5 cm long, 2-6 cm wide, acuminate, 3-nerved at base; flowers not in clusters; axis stellate-pilose; p. 42 Croton juigalensis S. & W.

Dl. Racemes 4-7 cm long Dm.

Dm. Blades densely stellate-hairy above; racemes 1-2 cm long; flowers densely stellate; pedicels 2-3 mm long Dn.

Dn. Blades acute at base; petioles very short, 6-8 mm long; glands of petiole small, on stipes; p. 45, fig. 36, p. 23 . . . Croton pluvialis S. & W.

Dn. Blades rounded at base, 3-nerved; petioles 1.5-2 cm long, without glands; p. 38 Croton comayaguensis S. & W.

Dm. Blades almost or quite glabrous above; flowers densely hairy Do.

Do. Glands of petiole saucer-shaped, sessile; racemes 1-2 cm long; petioles up to 2.5 cm long; blades cordate, 6-13 cm long, 3-7.5 cm wide, with few stellate hairs; pedicels short; ovary whitish-tomentose; seeds smooth; p. 42 . .

. Croton limnocharis Croizat

Do. Glands of petiole none or obscure; blades serrulate or entire Dp.

Dp. Blades beneath whitened or ashy, densely softly tomentose, glabrous above when mature, 4-11 cm long, 1.5-5.5 cm wide, 5-nerved at base; petioles 1-6 cm long; racemes 5-7 cm long; pedicels short; p. 47 . .

. Croton segoviarum S. & W.

Dp. Blades beneath sparsely stellate or later almost glabrous, rounded or obtuse at base; petioles 1-3 cm long Dq.

Dq. Pistillate sepals with dense reddish glands; glands ending in long hairs; blades 5-11 cm long; racemes 4-7 cm long; p. 40 Croton glandulo-sepalus Millsp.

Dq. Pistillate sepals without reddish glands; blades 2-6 (-9) cm long, 2-4 cm wide; pedicels 2-4 mm long; p. 41 Croton humilis L.

ANNOTATED LIST OF SPECIES OF ACALYPHA AND CROTON IN CENTRAL AMERICA

Acalypha alopecuroidea Jacq., Icon. Pl. Rar. 3: 19, pl. 620.
1786-1793.

Florida (FLAS), Mexico (US), Honduras (MO), Costa Rica (MO), Panama (FLAS, FSU), Jamaica (FLAS), W. I. (FLAS).

Panama, Canal Zone, Miraflores. Tyson 1391 (FSU), fig. 6, p. 4.

Nicaragua:

Dept. Rio San Juan, San Carlos. Nelson 5332 (SEYM).

Dept. Managua, Managua. Chaves 97 (US); Maxon, Harvey & Valentine 7553 (US); Neill 7494 (MO, SEYM, UCA); Croat 43153 (MO).

Dept. Masaya, Lake Masaya. Hall & Bockus 7880 (SEYM, UCA).

Dept. Granada, Laguna Blanca. Hall & Bockus 7847 (BM, FLAS, GH, MO, NY, SEYM, SMU, UC, UCA).

Dept. Rivas, Penas Blancas. Seymour 1871 (VT).

Blades widely ovate, truncate at base.

Acalypha apodanthes Standley & Williams, Ceiba 1: 241. 1950.

Stipules linear-subulate, 6-7 mm long. Petioles 1-2.5 cm long, densely pilose. Blades 5.5-10 cm long.

Costa Rica, Prov. Guanacaste, La Cruz. Wilbur & Stone 10224 (MO). Fig. 26, p. 18.

Acalypha arvensis Poepp. & Endl., Nov. Gen. 3: 21. 1845.

This species has been confused with *A. phleoides* because of the similarity in the outline of the blade. They are distinguished by the length of the petiole, in *A. arvensis* 2-3.5 cm, in *A. phleoides* less than 1 cm.

Panama, Cocle, El Cope. Tyson 5207 (FSU). Fig. 5, p. 6. Mexico (FLAS, US), British Honduras, Guatemala, Honduras (FSU), Costa Rica (FSU), Panama (FSU, MO), Martinique, tropical S. A.

Nicaragua:

Dept. Zelaya, Comarca del Cabo, Bihmona. Robbins 5676 (BM, ENAG, SEYM, SMU); Seymour 5723 (ENAG, MO, SEYM, SMU).

Corn Is. Seymour 4410 (MO, SEYM).

Rama. Seymour 720 (ENAG, F, GH, MO, SEYM, SMU).

Siuna. Seymour 3017 (SEYM).

Dept. Chontales, Santo Tomas. Atwood 2728 (SEYM);
Seymour 6313 (SEYM).

Dept. Rio San Juan, San Juan del Norte. Seymour 5302 (SEYM).
San Carlos. Seymour 5347 (MO);

Dept. Masaya, Nindirí. Zelaya 2329 (VT).
Park Nacional. Neill 2847 (UCA).

Dept. Rivas, Sapoa. Seymour 1883 (VT).

Acalypha chlorocardia Standley, Field Mus. Bot. 8: 18. 1930.

Known from the type, only, British Honduras, Middlesex.
Schip S-45.

Acalypha chordantha F. Seymour, species nova

This species was recognized by Standley & Williams and named by them but never published. I hereby validate the name and publish it, retaining the name given by them.

Frutex ramosus, gracilis, ramis teretibus, cinereis, pilis brevibus densis patentibus. Stipulae caducae. Petiolis pubescentibus ut caule 1-4 cm longis. Lamina ovata, 7-9.5 cm longa, 4-4.5 cm lata, sensim attenuato-acuminata, 5-7 denticulis per cm, arcte serrulata, basi breviter cordata, 3-nervia, supra viridis sparsim pilosa, simpliciter pilosula, subtus molli tactu, costa elevata, nervis lateralibus utroque latere (supra nervos basales) 5-7. Spicis unisexualibus. Spicis masculis

dense multifloris, breve pedunculatis vel sessilibus, 5-9 cm longis, 1.5-1.8 cm crassis. Floribus pilosis hispidulosis; rachidi minute pilosa. Spicis feminis terminalibus sessilibus, bracteis non congestis, 7-11-dentatis hispidulis.

TYPE: Nicaragua, Dept. Esteli, 15.5 mi N of Esteli, roadside thickets, alt. 2100 feet, 7 July 1962. Shrub 2 m high. Webster, Miller & Miller 12063 (MO), Fig. 30, p. 21.

Dept. Esteli, 5 kms from Esteli, thickets slong Esteli River, 3 Nov. 1968, alt. 900 m. Shrub 2 m. Molina 23005 (MO).

Dept. Madriz, ca. 7 miles south of Ocotal, along highway 15; disturbed roadside; 650 m elevation, 6 Aug. 1977. Shrub 2 m; inflorescence greenish. Croat 42801 (MO).

Acalypha costaricensis (Kuntze) Knobloch in Just, Bot. Jahrsb. 19: 337. 1894.

Honduras, Dept. Atlantida, Lancetillo Mountain. Molina & Molina 25632 (MO), fig. 29, p. 21.

Costa Rica (FLAS, FSU, MO), Panama (FSU).

Acalypha diversifolia Jacq., Pl. Hort. Schoenbr. 2:63, pl. 244. 1797.

Blades 4-8 cm wide.

Honduras (FSU, MO), Costa Rica (FSU), Panama (FSU).

Nicaragua:

Dept. Jinotega, Comarca de Bocaycito. Neill N95 (MSC, SEYM).

Penas Blancas. Atwood A72 (MSC, SEYM).

Dept. Matagalpa, Tuma. Neill 7224 (GH, MO, SEYM, UCA).

Dept. Rivas, Penas Blancas. Atwood 1810 (BM, ENAG, FLAS, GH, MO, NY, SEYM, SMU, UC). Fig. 20, p. 15.

Dept. Masaya, Lake Masaya. Seymour 3308 (SEYM).

Acalypha euphrasio-stachys Bartlett, Proc. Amer. Acad. 43:55. 1907. Type from Guatemala, Fl. Guatemala 6: 33. 1949.

Mexico, Dist. Tamescaltepec, Rincon del Carmen. Hinton 1954 (MO). Fig. 21, p. 15.

Guatemala. Spikes sessile.

Acalypha ferdinandii K. Hoffm., Pflanzenreich IV, 147, xvi:63. 1924.

a. Parts glabrous except the very young and inflorescence;

fruiting bracts 1-2-flowered var. ferdinandii

a. Branches and petioles tawny-tomentose; leaf above sparingly, beneath on midrib and veins soft-hairy; pistillate bracts solitary, 1-flowered, in axils of leaves

. var. pubescens K. Hoffm.

Acalypha ferdinandii var. ferdinandii.

Mexico (MO), Guatemala, Honduras (MO), Costa Rica.

Mexico, near Palenque. Hoover 153 (MO), fig. 27, p. 18.

Acalypha ferdinandii var. pubescens K. Hoffm., Pflanzenreich IV, 147, xvi: 64. 1924.

Mexico (MO), British Honduras (MO), Honduras (MO).

Acalypha fertilis Standley & Williams, Ceiba 1: 146. 1950.

Mexico (FSU), Costa Rica.

Acalypha firmula Muell. Arg., Linnaea 34: 21. 1865.

Type from San Salvador, Fl. Guatemala 6: 34. 1949.

Honduras (FSU, MO).

Acalypha flagellata Millsp, Field Mus. Bot. 2: 417. 1916.

Mexico (FSU), Yucatan, Guatemala.

Acalypha garnieri Standley & Williams, Ceiba 1: 147. 1950.

Costa Rica, Prov. Guanacaste, Finca La Pacifica. Opler 829 (MO), fig. 28, p. 18.

Nicaragua, Dept. Jinotega. Standley 10042 (F), type; same, dup. 10042 (EAP); Standley 49663.

Dept. Managua, Sierra de Managua. Garnier 125.

Acalypha guatemalensis Pax & Hoffm., Pflanzenreich IV. 147, xvi: 27. 1924.

Guatemala, Lake Atitlan, Panajachel. Burch 5560 (MO), fig. 11, p. 4. Dept. Huehuetenango, Jacaltenango-San Marcos. Boeke 194 (MO).

Blades 2-5.5 cm wide. For comparison with similar species, see Croizat, Field Mus. Bot. 22: 447. 1942.

Acalypha gummifera Lundell, Contr. Univ. Mich. Herb. 4: 10.

British Honduras.

Type: British Honduras, Camp 34, boundary. Schipp 1290.

Acalypha hispida Burm., Fl. Ind. 203, pl. 61, f. 1. 1768.

Flowers sessile. Blades scabrous above and minutely white-dotted, beneath hairy along main veins and in axils, otherwise sparsely hairy, glabrescent and minutely resinous.

Mexico, State Sinaloa, Maxatlan. Ortega 5768 (MO), fig. 22, p. 15.

Petioles without glands. The uppermost leaves on very short petioles.

Mexico (MO), Guatemala, Antigua, S. Pacific, Fl. Guatemala 6: 36. 1949.

Acalypha indica L., Sp. Pl. 1036. 1753.

a. Spikes 1-7 cm long var. indica

a. Spikes 0.5-1 cm long var. mexicana

Acalypha indica L. var. mexicana (Muell. Arg.) Pax & Hoffm.

Pflanzenreich IV. 147, xvi: 35. 1921. This is the only var. known in Central America.

S. Mexico (MO), Guatemala, Costa Rica (FSU, MO).

Acalypha lancetillae Standley, Field Mus. Bot. 4: 312. 1929.

British Honduras (MO), Honduras.

British Honduras, Dist. Toledo, Medina Bank. Proctor

35894 (MO), 35895 (MO), fig. 25, p. 18.

Acalypha langiana Muell. Arg., Linnaea 34: 159. 1865.

Petioles 1.5-5(-8) cm long. Spikes 1.5-5(-7) cm long.

S. Mexico (MO), Guatemala, Fl. Guatemala 6: 137. 1949.

Acalypha leptopoda Muell. Arg., Linnaea 34: 39. 1865.

Fl. Guatemala 6: 38. 1949 distinguishes the varieties as follows:

a. Leaves and stems glabrate, leaves often quite glabrous at maturity var. glabrescens

A. Leaves densely velutinous-pilose, especially beneath, pubescence persistent in age var. mollis

Acalypha leptopoda var. glabrescens Muell. Arg. in DC.,

Prodr. 15, pt. 2: 524. 1866. S. Mexico (FSU), Guatemala, Honduras, Salvador to Panama (FSU).

Blades 3-nerved at base, pinnately nerved above base.

Nicaragua, Dept. Esteli, Esteli. Molina 23005 (MO).

Acalypha leptopoda var. mollis Muell. Arg. in DC., Prodr.

15. pt. 2: 824. 1866.

S. Mexico, Guatemala, Honduras, Costa Rica, Panama (FSU).

Acalypha macrostachya Jacq., Pl. Hort. Schoenbr. 2: 63, pl. 245. 1797.

Fl. Guatemala 6: 39. 1949 distinguishes the varieties essentially as follows:

a. Branches when young and petioles usually very densely pilose; blades densely velutinous-pilose beneath, pubescence persistent in age var. hirsutissima

a. Branches and petioles sparsely or rather densely hirsute or pubescent; blades in age glabrate except on nerves

. var. macrophylla

Acalypha macrostachya var. hirsutissima (Willd.) Muell. Arg.,
Linnaea 34: 11, pt. 2: 345. 1865.

Mexico, British Honduras to Costa Rica (FSU), panama
(LAS, FSU).

Acalypha macrostachya var. macrophylla (HBK.) Muell. Arg.,
in Mart. Fl. Bras. 11, pt. 2: 345. 1874.

Mexico (MO), British Honduras (MO), Guatemala, Honduras,
Panama (FSU), tropical S. A.

Acalypha mollis HBK., Nov. Gen. & Sp. 2: 94. 1817.

S. Mexico (FSU, MO), Guatemala, Fl. Guatemala 6: 40. 1949.

Acalypha mortoniana Lundell, Bull. Torrey Club 64: 552. 1937.

Type: Guatemala, Dept. Peten, Uaxactun. Bartlett 12740
(MICH). British Honduras (FSU, MO).

Acalypha muelleriana Urban, Symb. Ant. 1: 338. 1899.

Similar to *A. villosa* in having small distant fruits. In *A. muelleriana*, fruiting pedicels are 1-2 mm long, the fruits are 1-3 mm apart. In *A. villosa*, fruiting pedicels are 2-3 mm long, fruits are 5 mm apart.

Costa Rica (FSU, MO).

Acalypha nicaraguensis Pax & Hoffm., Pflanzenreich IV, 147,
xvi: 254. 1924.

Mexico, State Colima, Manzanillo. Eiten 328 (MO), fig. 7,
p. 4.

Nicaragua, Dept. Chinandega, Corinto. Brenning 175.

Acalypha oblancifolia Lundell, Wrightia 5: 243 (-244). 1976.
Guatemala.

Acalypha obtusifolia Pax & Hoffm., Pflanzenreich IV, 147, xvi:
147. 1924.

Costa Rica. Known from the original collection only, Ton-
duz 6823.

Acalypha persimilis Muell. Arg., Linnaea 34: 25. 1865.

In this group of species, the pistillate bracts are very characteristic. In *A. persimilis*, pistillate bracts are only 3-4 mm long (including teeth) and rather close together, the teeth are very narrow and acute.

Mexico, Durango. Palmer 504 (MO), fig. 10, p. 4.

Guatemala, Greater Antilles, Fl. Guatemala 6: 40. 1949.

Acalypha phleoides Cav., Icon. Pl. 6: 42, pl. 569, f. 2. 1801.
Mexico, Chihuahua. Le Seur Mex-83 (MO), fig. 12, p. 4.
Guatemala.

Lobes of styles might be mistaken for teeth of bracts, but
the teeth of bracts bear long gland-tipped hairs.

Acalypha pittieri Pax & Hoffm., Pflanzenreich IV, 147, xvi: 18.
1924. known from the original collection only, Costa Rica,
Cocos Island. Pittier 16246.

Blades 5-nerved at base, crenate-serrate. Pistillate flowers
on pedicels. Racemes 7 cm long.

Acalypha poiretii Sprengel, Syst. 3: 879. 1826.
S. Mexico (MO), Guatemala ?, tropical S. A.

Acalypha polystachya Jacq., Pl. Hort. Schoenbr. 2:64, pl. 246.
1797. Mexico, Costa Rica (MO), Fl. Guatemala 6: 41. 1949.
Panama (FSU).

Nicaragua:

Dept. Leon, Volcan Momotombo. Hall & Bockus 7797 (BM,
FLAS, GH, MO, NY, SEYM, SMU, UC, UCA), Fig. 3, p.
6.

Dept. Managua, Managua. Seymour 6279 (SEYM).

Dept. Masaya, Park Nacional. Stevens 4254 (MO).

Acalypha porcina Standley & Williams, Ceiba 3: 208. 1953.
Type: Nicaragua, Dept. Esteli, Esteli. Standley 20251
(EAP); dupl. (F).
Panama.

Acalypha porphyrantha Standley, Journ. Arn. Arb. 11: 32.
1930. Fl. Guatemala 6: 34. 1949 treats this species as a
synonym of Acalypha firmula Muell. Arg.
Honduras (MO).

Acalypha pseudo-alopecuroides Pax & Hoffm., Pflanzenreich
IV, 147, xvi: 86. 1924.
S. Mexico, Honduras, Fl. Guatemala 6: 42. 1949.

Acalypha radinostachya Donn. Smith, Bot. Gaz. 54: 243. 1912.
For description, see Pflanzenreich IV, 147, xvi: 49. 1924.
Known from original collection only, Costa Rica, Prov.

Costa Rica, Prov. Limon, Llanuras de Santa Clara. Donnell Smith 6849. Suffruticose.

Acalypha retifera Standley & Williams, Ceiba 3: 209. 1953.
Honduras.

Acalypha salvadorensis Standley, Journ. Wash. Acad. Sci. 14: 96. 1924.

Salvador, San Salvador. Calderon 1741 (MO), fig. 9, p. 4. Pistillate bracts large, 5 mm long, shallowly toothed, obscuring flowers, conspicuously larger than in *A. persimilis* and *A. subviscida*. Spikes erect, surpassing leaves.

Acalypha schiedeana Schlechter, Linnaea 7: 384. 1832.

Mexico (FLAS); Honduras, Tegucigalpa. Burch 5463 (MO), fig. 31, p. 21; Costa Rica.

Nicaragua:

Dept. Esteli, Salto de Estanzuela. Hall 7680 (FLAS, GH, MO, SEYM, SMU, UCA).

Dept. Leon, Volcan Momotombo. Neill 7339 (BM, FLAS, GH, MO, MSC, NY, REED, SEYM, SMU, UC, UCA).

Dept. Managua, Managua. Neill 1079 (SEYM, UCA).

Dept. Masaya, Lake Masaya. Seymour 3308 (SEYM).

Acalypha septemloba Muell. Arg., Flora 55: 27. 1872.

Type: Costa Rica, Cartago. Friedrichsthal 1354, Fl. Guatemala 6: 43. 1949. *Acalypha irazuensis* Kuntze, Rev. Gen. 616. 1891.

Costa Rica, Panama, Fl. Panama 54: 306. 1967.

Acalypha setosa A. Rich. in Sagra. Hist. Cuba 3: 204. 1850.

Florida (FLAS), Mexico (MO), British Honduras, Guatemala, Honduras, W. I., nw S. A.

Nicaragua, Dept. Managua. Zelaya 269 (BM, ENAG, F, GH, MO, NY, SEYM, SMU, UC, WDP).

Dept. Granada, Volcan Mombacho. Atwood & Neill AN48 (MO, SEYM, UCA), Fig. 4, p. 6; Dudgey & Moore 1924 (VT).

Acalypha skutchii I. M. Johnston, Journ. Arn. Arb. 19: 120.

1938. Mexico, Guatemala, Fl. Guatemala 6: 43. 1949.

Costa Rica (MO). In some characters like *A. tenuicauda*, but pistillate spikes terminal. In *A. tenuicauda*, spikes are all axillary.

Acalypha subviscida S. Watson, Proc. Amer. Acad. 21: 440.

1886. Mexico, State Morelos, Cuernavaca. Pringle 3191 (MO), fig. 8, p. 4. Guatemala.

Similar to *A. salvadorensis* in habit, but bracts (pistillate) 2-3 mm long, strikingly smaller than in *A. salvadorensis*, and not crowded but having flowerless intervals.

Acalypha tenuicauda Pax & Hoffm., Pflanzenreich IV, 147, xvi:

149. 1924. Costa Rica, Prov. San Jose, El General.

Skutch 2487 (MO), fig. 23, p. 15.

Guatemala. Styles red.

Acalypha trachyloba Muell. Arg., Flora 55: 25. 1872.

Mexico, Guatemala, Fl. Guatemala 6: 45. 1949.

A. leptopoda also has pistillate spikes on long slender peduncles but has only a few bracts in a head. *A. trachyloba* has many bracts and stipules reflexed.

Acalypha triloba Muell. Arg., Linnaea 34: 23. 1865.

Guatemala. Petioles mostly 0.5-3.5 cm long.

Acalypha unibracteata Muell. Arg., Linnaea 34: 160. 1865.

S. Mexico (FSU), British Honduras (FSU), Guatemala, Salvador.

Nicaragua, Dept. Zelaya, Corn Is. Atwood 4356 (B, BM, ENAG, FLAS, GH, MO, NY, REED, SEYM, SMU, UC).

Longer petioles 3-8 mm long, usually 4-5 mm long.

Acalypha villosa Jacq., Sel. Stirp. Amer. 254, pl. 183, f. 61. 1763.

British Honduras (FSU) to Brazil, Fl. Panama 54: 302. 1967.

All spikes are axillary, some nearly but not really terminal. (Angelo). *A. costaricensis* has similar leaves, but unlike *A. villosa*, it has pinnately nerved blades.

Acalypha wilkesiana Muell. Arg. in DC., Prodr. 15, pt. 2: 817.

1866. Extensively cultivated. In cultivation, leaves vary from lanceolate to orbicular. Out of cultivation, blades usually suborbicular. Petioles 1-3(-5) cm long. Florida (FLAS).

Nicaragua: Salas, Juan B. Lista Especies de la Flora Nicaraguense 20. 1966.

Croton adpersus Benth. Pl. Hartweg. 51. 1840.

Croton botryocarpus Croizat, Field Mus. Bot. 22: 445. 1942.
S. Mexico, Guatemala.

Croton aguilarii Lundell, Phytologia 1: 401. 1940.

Guatemala. Type: Guatemala, Peten, La Libertad. Coll.
M. Aguilar 463.

Croton asteroides Lundell, Phytologia 1: 402. 1940.

Type: British Honduras, El Cayo District, Vaca. Gentle
2218 (MICH).

Croton atwoodianus F. Seymour, species nova.

Named in honor of Mr. John T. Atwood, Jr., my companion in several expeditions to Nicaragua, a specialist in Orchidaceae; collector of thousands of specimens in Nicaragua; author of "A Floristic Study of Volcan Mombacho, Department of Granada, Nicaragua", 1976, a master's thesis in Michigan State University.

Frutex 1m altus, pilis albis stellato-tomentosis. Petiolo 6-6.5 cm longo, dense stellato-piloso, eglanduloso. Lamina obtusa, deltoido-ovata, basi rotundata vel breviter cordata, 5-nervia, grosse irregulatim crenato-dentata, ca. 3 dentis per cm, novellis fere albis, minute stellatis super subtusque. Venis fere prominulis subtus. Inflorentia brevis unisexualis, 1-1.5 cm longa; staminatis spicis terminalibus; pistillatis spicis axillaribus. Capsulo ovoido, glabro, flavo, 2 X 6 mm.

Type: Nicaragua, Dept. Managua, Managua. Robbins 6092 (MO). Fig. 47, p. 26. Isotypes: B, BM, ENAG, GH, NY, SEYM, SMU, UC.

Florida, Levy County, Williston. R. H. Strang (FLAS).

Croton axillaris Muell. Arg., Linnaea 34: 126. 1865.

Type: Nicaragua, Granada Fl. Guatemala 6: 67. 1949.
Costa Rica (US).

Nicaragua, Dept. Esteli, Salto de Estanzuela. Seymour 7725 (SEYM).

Dept. Boaco, Teustepe. Seymour 2420b (SEYM).

Some blackish hairs as in *C. cortesianus*. Blades somewhat hairy above as beneath. Pistillate flowers and fruit unknown. Inflorescences "axillary and terminal".

The distinction between this species and *C. pittieri* is very unsatisfactory. The length of petioles used in the key is not sufficient. Perhaps it is a synonym of *C. pittieri* Pax, in which case *Croton axillaris* Muell. Arg. is the name to be used.

Croton bilbergianus Muell. Arg., Linnaea 34: 98. 1865.

Mexico to Panama (FLAS, FSU), Costa Rica (US).

British Honduras (MO).

Croton brevipes Pax, Bot. Jahrb. 33: 290. 1903.

Original collection: Rio del Convento, Disquis Valley.

Pittier 12117.

Costa Rica (FSU, MO), Panama (US).

Similar in outline of leaf to *Acalypha ferdinandii* and *A. lancetillae* and *A. apodanthes*.

Croton callistanthus Croizat, Journ. Arn. Arb. 21: 84. 1940.

Guatemala (US).

Costa Rica, Prov. Cartago. R. R. Smith 2201 (FLAS).

Nicaragua, Dept. Esteli, El Bosque. Neill 7347 (FLAS, SEYM, UCA).

Miraflores. Neill N232 (MSC).

Croton ceanothifolius Standley & Williams, Ceiba 3: 117. 1952.

Type: Nicaragua, Dept. Chontales, "Juticalpa". Standley & Williams 9287(F); dupl. (EAP).

Croton ciliato-glanduliferus Ortega, Hort. Matr. Dec. 51.1797.

Mexico (FLAS, FSU), Honduras (FSU, US).

Inflorescences 4.5-7 cm long, when well developed.

Croton comayaguanus Standley & Williams, Ceiba 3: 118. 1952.

Honduras. Blades usually attenuate-acuminate, rarely rounded at tip.

Croton comes Standley & Williams, Ceiba 1: 148. 1950.

Honduras.

Croton cortesianus HBK., Nov. Gen. & Sp. 2: 83. 1817.

Mexico, Municipio La Trinitaria. Breedlove & Raven 8348 (FSU), fig. 32, p. 21.

Mexico (FLAS, FSU), Honduras (US).

Nicaragua: Dept. Jinotega, 5 miles E of El Jocote. Croat 42875 (MO).

Dept. Esteli, Esteli. Molina 7230 (US).

4 miles S of Esteli. Dwyer et alii 447, 453 (MO).

ca. 4 miles W of El Jocote. Croat 42844 (MO).

Laguna de Miraflores. Neill N237 (SEYM).

Salto de Estanzuela. Neill 1167 (SEYM, UCA).

Blades pinnately veined at base (Angelo). Like *C. axillaris*, this species has blackish hairs on branches. Unlike *C. axillaris*, its blades are glabrous above.

Croton costaricensis Pax in Pittier, Prim. 2: 231. 1900.

Honduras, Costa Rica (US).

Staminate spikes not sessile (Angelo).

Croton fantzianus F. Seymour, species nova.

Named in honor of Dr. Paul R. Fantz, formerly of the University of Florida, now of the Fairchild Gardens, author of a monograph (unpublished) of Clitoria, presented for his doctoral thesis.

Frutex vel arbor. Ramis novellis lepidotis ut laminis et sepalis. Petioli 2-4.5 cm longi. Foliae congestae ad apicem ramorum. Petioli et calyces cum lepidis similibus lepidis laminarum. Lamina major, 6-8 cm longa, 5-8 cm lata; elliptico-ovata ad suborbicularis, profunde anguste cordata, fere obtusa ad apicem, supra lepidata, lepides minutae albae orbiculares ad centralem rubrae, subtus denser albida. Racemi axillares, 1-1.5 cm longi.

Type: Nicaragua, Dept. Nueva Segovia, Dipilto. Budier 6390 (FLAS). Fig. 48, p. 28. Isotypes: BM, ENAG, GH, MO, NY, SEYM, SMU, UC.

Nicaragua, Dept. Esteli, Condega. Croat 42833 (MO).

Croton flavens L., Syst. ed. 10: 276. 1759.

Bahamas (FLAS), Jamaica (FLAS), Dominica (FLAS, FSU, MO). Honduras. Reported by Standley as new to Central America, Journ. Arn. Arb. 11: 32. 1930.

For description, see Fl. Jamaica, Fawcett & Rendle, 2: 279. 1920.

"A low aromatic shrub, densely stellate-tomentose; leaves oblong-ovate, acute or acuminate, rounded or subcordate at the base; flowers in dense stout racemes." Standley in Fl. Yucatan, Field Mus. Bot. 3: 320. 1930.

Small tree. Leaves ovate-lanceolate to ovate, 2-10 cm, stellate-tomentose. Inflorescence terminal, 2-5 cm long. Fl. Cuba 3: 69. 1953.

Croton fragilis HBK., Nov. Gen. & Sp. 2: 75. 1817.

Description in Contr. U. S. Nat. Herb. 23: 613. 1923.

S. Mexico, Guatemala (US), nw. S. A.

Inflorescences 2-15 cm long, typically 7-8 cm long (Angelo). A very variable species, as there may or may not be glands on the petiole; blades may be entire or serrulate, green or glabrous above; inflorescences may be terminal or axillary.

Croton fragrans HBK., Nov. Gen. & Sp. 2: 81. 1817.
Panama (US).

Croton glabellus L., Sp. Pl. ed. 2, 1425. 1763.

Mexico (US), British Honduras (FLAS, FSU), Guatemala (FLAS, US), Honduras (US).

Costa Rica, Prov. Puntarenas, Palmar Norte de Osa. Allen 5716 (FSU), fig. 15, p. 9.

Croton glandulo-sepalus Millsp., Field Mus. Bot. 2: 419. 1916.
Yucatan, British Honduras.

Croton glandulosus L., Syst. ed. 10, 1275. 1759.

Mexico, Guatemala, Honduras, Costa Rica, Panama (US).
Nicaragua:

Dept. Chinandega, Cosiguina Volcano. Howell 10285 (US).

Corinto. Maxon, Harvey & Valentine 7217 (US).

Dept. Managua, Managua. Chaves 236 (US).

Rene 69 (US).

Dept. Granada, Granada. Maxon, Harvey & Valentine 7630 (US);
Nichols 1136 (ENAG, GH, MO, SEYM, SMU);
Neill 2680 (SEYM, UCA).

Croton grosseri Pax, Bot. Jahrb. 33: 290. 1903.

Costa Rica, Pittier 1206. Known from the original collection only.

Croton guatemalensis Lotsy, Bot. Gaz. 20: 353, pl. 25. 1895.

Croton eluteroides Lotsy, Bot. Gaz. 20: 353, pl. 25. 1895.

In the original descriptions, the principal difference between these two proposed species seems to be the length of the spikes, longer than the leaves in *C. guatemalensis* and shorter than the leaves in *C. eluteroides*. This seems an inadequate basis for distinguishing species, since the length of spikes is sometimes very variable.

Mexico (FSU), British Honduras, Guatemala, Honduras, Salvador, Costa Rica (US).

Nicaragua, Dept. Chontales, between Boaco cut off and Acoyapa. Bunting & Licht 704 (US).

This species is much confused with *C. niveus* Jacq. and *C. reflexifolius* HBK. See Croizat, Field Mus. Bot. 22: 447. 1942.

Croton heterochrous Muell. Arg., Linnaea 34: 121. 1865-66.

Blades entire but stellate pubescence gives appearance of minute teeth in some cases. (Angelo). Honduras (MO).

Nicaragua, Dept. Madriz, Somoto. Molina 27231 (US).

Croton hircinus Vent., Jard. Malm. 50. 1803.

Croton allenii Standley, Ann. Mo. Bot. Gard. 26: 289. 1939.
Panama, Cocle. McDaniel & Cooke 14779 (FSU), fig. 38, p. 26.

Panama only (US), Venezuela (MO). Blades toothed, ovate.

Croton hirtus L'Her., Stirp. Nov. 17. 1784.

Hairs stellate, but widely spreading from stem.

Mexico (FLAS, US), Honduras (US), Costa Rica (FLAS),
Panama (FSU, US).

Panama, Prov. Panama, Canita. Tyson & Smith 4148
(FSU), fig. 1, p. 6.

Nicaragua:

Dept. Zelaya, Puerto Cabezas. Molina 14808 (US).

Dept. Rio San Juan, San Bartolo. Seymour 6153 (B, BM,
DUKE, ENAG, FLAS, GH, MICH, MO, NY, SEYM, SMU,
UC, WDP).

Dept. Esteli, Esteli. Dwyer et aliis 477 (MO).

Dept. Matagalpa, Matagalpa. Zelaya 2283 (ENAG, FLAS,
SEYM, SMU).

Dept. Managua, Managua. Seymour 6295 (ENAG, MO, SEYM).
Neill 7381 (UCA), 7493 (GH, MO, SEYM, SMU, UCA).

Dept. Masaya, Lake Masaya. Seymour 3315 (SEYM).
Parke Nacional. Neill 4611 (UCA).

Croton hoffmannii Muell. Arg., Linnaea 34: 86. 1865.

Pistillate spikes terminal; flowers distinct, not clustered.
Costa Rica (MO, US), Panama FSU).

Nicaragua: Salas 20. 1966.

Croton humilis L., Syst. ed. 10: 1276. 1759.

For description, see Contr. U. S. Nat. Herb. 23: 616. 1923.
Blades 2-6 cm long; racemes 3-5 cm long.

Texas, Florida, Mexico (FLAS, US), Yucatan (MO), Jamaica (FLAS).

For description, see Fl. Jamaica 4: 283. 1920.

Nicaragua: Salas 20. 1966.

Croton jalapensis Croizat, Field Mus. Bot. 22: 449. 1942.

Remarkably similar to *C. hircinus* and *C. quercetorum*. See
key, p. 25. Endemic in Guatemala.

Croton jimenezii Standley & Valerio, Fl. Costa Rica 18: 604.
1937. For description, see same.

Costa Rica, Prov. Heredia, between Volcan Barba and Volcan Irazu. Godfrey 66146a (FSU), fig. 39, p. 26.

Croton jimenezii, cont.

The type lacks pistillate parts.

Blades entire, pinnately or palmately veined. Petiole with no conspicuous glands (Angelo). Flowers not clustered as in *C. panamensis*.

Croton juigalpensis Standley & Williams, Ceiba 3: 209. 1953.
Honduras (US).

Nicaragua:

Dept. Esteli, Cerro Las Animas. Standley 20296. Cited with original description.

Dept. Chontales, Juigalpa. Standley 9433, Type (F); dupl. (EAP); Standley 9217.

Croton jutiapensis Croizat, Field Mus. Bot. 22: 450. 1942.

Pedicels of staminate flowers 1-3 mm long (Angelo). Larger blades 1-3 (-4) cm wide. Pistillate flowers sessile or pedicels 1 mm long (Angelo).

Mexico (US), Honduras (US), Guatemala.

Nicaragua, Dept. Managua, 20 miles NE of Managua. Webster, Miller & Miller 12463 (MO).

Croton lasiopetaloides Croizat, Field Mus. Bot. 22: 450. 1942.

Type: Guatemala, mountains west of Aguacatan, on the road to Huehuetenango. Standley 81219.

Croton limnocharis Croizat, Field Mus. Bot. 22: 451. 1942.

Guatemala, endemic, Fl. Guatemala 6: 74. 1949.

Similar to *C. pungens* in which pistillate flowers are sessile; in *C. limnocharis* pistillate pedicels are 2 mm long.

Croton lobatus L., Sp. Pl. 1005. 1753.

Florida (FLAS), British Honduras, Guatemala (MO), British Honduras to Salvador and Panama, Fl. Guatemala 6: 75. 1949. Antigua (FLAS, FSU), Brazil (FSU).

Croton lotorius Croizat, Journ. Arn. Arb. 26: 185. 1945.

Known from the type only, Guatemala, Huehuetenango, between Santa Ana Huista and forest of Rancho Lucas. Steyermark 51332.

Croton lundellii Standley, Carnegie Inst. Wash. Publ. 461: 67. 1935. Type from Guatemala, Campeche, Tuxpena.

Blades large, sparsely irregularly toothed, sparsely stellate-hairy above, densely so beneath, or stellate hairs scale-like. Some inflorescences terminal, some acillary (Angelo).

Croton lundellii Standley, cont.

Mexico, Guatemala (MO), US).

Nicaragua: Dept. Esteli, Limay. Neill 1194 (SEYM), fig. 17, p. 11.

Croton nitens Sw., Prodr. Veg. Ind. Occ. 100. 1797-1806.

Costa Rica, Prov. Puntarenas, Canto de Osa, Gulfo Dulce Area. Allen 5213 (US), fig. 13, p. 9. Shrub or small tree. British Honduras, District Toledo, Big Falls. Proctor 35836 (MO).

Longer petioles 5-10 cm long, scaly not hairy, without glands. Larger blades 13-17 cm long, 5.3-6.7 cm wide. Scales with red center on petiole and midrib beneath. Blades densely scaly beneath with white scales. Stem densely red-scaly. Blades pinnately nerved. Staminate spikes 5-7 cm long, axillary; pedicels 2 mm long. Pistillate spikes 5 cm long, axillary, few-flowered. Capsules 8 mm thick, scaly.

Croton niveus Jacq., Enum. Pl. Carib. 32. 1760.

Mexico, Tamaulipas, Los Coyotes. Le Seur 589 (US), fig. 18, p. 11.

Mexico (FLAS, US), Salvador (US), Honduras (US), Costa Rica (US), Panama (US).

Nicaragua:

Dept. Managua, Managua. Chaves 391 (US).

Rio Santa Clara. Neill 2866 (SEYM, UCA).

Dept. Chontales, Route 7, between Boaco cutoff and Acoyapa. Bunting & Licht 704 (US).

Croton olanchanus Standley & Williams, Ceiba 1: 149. 1950.

Guatemala ?, Honduras.

Similar to Croton xalapensis. The following key distinguishes the two species.

- A. Staminate and especially pistillate flowers on long pedicels; pistillate pedicels 4-8 mm long; staminate pedicels up to 6 mm long; blades 9.5-16 cm wide, 3-5-nerved at base; petioles 9-14 cm long; blades deeply cordate (4 cm); glands of petiole sessile Croton olanchanus
- A. Staminate and pistillate flowers on short pedicels; blades 2-6 cm wide; petioles 2-3 cm long; basal nerves strong but essentially pinnately nerved, cordate; glands of petiole on stipès Croton xalapensis

Croton ortholobus Muell. Arg., Flora 55: 9. 1872.

Photo of type specimen in Harvard Herbaria.

Costa Rica, prope Cartago. Friedrichsthal 1417.

Blades coarsely toothed, about 4 teeth per cm. (Angelo).

Not in Guatemala as sometimes reported. Flora Guatemala 6: 76. 1949.

Croton pagiveteris Croizat, Journ. Arn. Arb. 21: 85. 1940.

Type: Guatemala. Seler 2776 (GH).

Mexico, Guatemala (US).

Croton panamensis (Klotzsch) Muell. Arg. in DC. Prodr. 15(2): 546, fig. 9. 1866.

At least some petioles 5-20 cm long, shorter on young leaves only.

Mexico (FLAS), Honduras ; Costa Rica (FSU, US), Panama (FLAS, FSU, US). Panama, Cocle, Caimito. McDaniel & Cooke 14815 (FLAS), fig. 40, p. 26.

Nicaragua:

Dept. Jinotega, Lago de Apanas. Croat 43000 (MO).

Dept. Nueva Segovia, Las Manos to Ocotal. Harriman 14609 (FLAS).

Dept. Esteli, Llano 4 de Mayo. Neill 7355 (GH, MO, SEYM, SMU, UCA).

El Bosque. Neill 7347 (FLAS, GH, MO, SEYM, SMU, UCA).

El Paraiso. Atwood & Neill AN245 (MO, MSC, SEYM).

Miraflores. Neill N232 (GH, MO, MSC, SEYM, UCA).

Dept. Matagalpa, La Fundadora. Hall & Bockus 7937 (B, BM, FLAS, GH, MO, MSC, NY, REED, SEYM, SMU, UC, UCA).

Seeds 5 X 3.5 mm; in *C. callistanthus* seeds are 3 X 3 mm.

Croton payaquensis Standley, Journ. Wash. Acad. Sci. 14: 97. 1924.

Inflorescences "axillary and some are terminal". (Angelo).

Guatemala (MO), Honduras, Salvador (US).

Nicaragua:

Dept. Chinandega, Volcan Cosiguina. Neill 7098 (SEYM).

Dept. Leon, Paneloya. D'Arcy 10412 (MO).

Santa Rosa. Williams & Molina 42430 (US).

Croton petensis Lundell, Phytologia 1: 406. 1940.

As pistillate flowers are unknown, the difference between this species and *Croton lundellii* are not clear.

British Honduras, Orange Walk Dist. near Guatemala Border. Winzarling viii-12 (US).

Croton pittieri Pax in Pittier, Prim. Fl. Costaricensis 2: 328. 1900.

Costa Rica, "Carre" Las Concavas. Lankester 879 (US), fig. 35, p. 23. Sacaris, Cerro de Pretl 333 (MO).
Dark stellate hairs on stem and inflorescence.

Croton pluvialis Standley & Williams, Ceiba 3: 119. 1952.

Type: Nicaragua, Jinotega. Standley 11034 (F).

Nicaragua: Dept. Jinotega, W of Jinotega, Cerro de la Cruz.

Standley 10187 (EAP, F, US), fig. 36, p. 23.

Petioles 6-8 mm long.

Croton pseudo-niveus Lundell, Phytologia 1: 449. 1940.

Mexico, State Sinaloa, Los Labrados. Mexia 921 (MO), type collection. Examined.

Panama, Prov. Los Santos, Pocri. Dwyer 1124 (FSU), fig. 19, p. 11.

For description, see also Ann. Mo. Bot. Gard. 54:252. 1967..

Croton punctatus Jacq., Coll. Bot. 1: 166. 1787; Icon. Pl. Rar. 3: 19, pl. 621. 1789; Muell. Arg. in DC., Prodr. 15(2): 540. 1866.

Although probably perennial, this species appears shrubby.

Texas (FLAS) to N. C. (FLAS), Florida (FLAS), Mexico (MO), British Honduras, Honduras (FSU), Costa Rica, Panama (FSU, US).

Nicaragua, Dept. Zelaya, Bluefields. Hamblett 620 (B, ENAG, SEYM).

El Bluff. Marshall & Neill 6512 (ENAG, FLAS, GH, MO, SEYM, SMU).

Croton pungens Jacq., Coll. 4: 217. 1791. Icon. Pl. Rar. 3: 19, pl. 622. 1794; Muell. Arg. in DC., Prodr. 15(2): 540. 1866.

Croton standleyi Steyermark, Field Mus. Bot. 22: 151. 1910.

Panama, Chiriqui, El Hato del Volcan. McDaniel 10077 (FSU), fig. 37, p. 23. Panama (US).

Similar to Croton xalapensis, but C. pungens has both pistillate and staminate flowers in lower nodes of inflorescence.

Fl. Panama 54: 257. 1967. Similar to C. limnocharis also, but in C. limnocharis pistillate pedicels are 2 mm long. In C. prngens, pistillate flowers are subsessile.

Croton pyramidalis Donn. Smith, Bot. Gaz. 35: 7. 1903.

British Honduras, District Toledo, San Jose. Croat 24445 (FSU), fig. 16, p. 11.

S. Mexico, Guatemala, Honduras (MO, US).

Blades palmately veined. (Angelo). Fruiting pedicels 5-10 mm long, thicker than in *C. niveus*.

Croton pyriticus Croizat, Journ. Arn. Arb. 26: 186. 1945.

Costa Rica (MO).

Nicaragua, Dept. Esteli, Cerro Quiabu. Neill 7758 (BM, FLAS, GH, MO, NY, SEYM, SMU, UC, UCA).

Llano 4 de Mayo. Neill 7354 (GH, MO, SEYM, SMU, UCA).

Fruit 2 cm long, stellate-hairy in patches. Seeds 1.5-1.6 cm long. (Angelo).

Croton quercetorum Croizat, Field Mus. Bot. 22: 452. 1942.

The description of this species is remarkably similar to that of *C. jalapensis* Croizat, published in the same article. See key, p. 25.

Croton reflexifolius HBK., Nov. Gen. & Sp. 2: 68. 1817.

Blades under high magnification red-dotted above and more so beneath. Capsules tuberculate, hispid (Contr. U. S. Nat. Herb. 23: 610), whereas in *C. niveus* they are smooth, densely scaly. Some inflorescences terminal. (Angelo).

Mexico, British Honduras (FSU), Guatemala, Honduras, Costa Rica (US).

Croton repens Schlechter, Linnaea 19: 237. 1847.

Mexico, British Honduras (FSU, US), Guatemala, Honduras (FSU, MO), Salvador (US). Honduras, Dept. Comayagua, Siguatepeque. Clewell 3155 (FSU), fig. 24, p. 18.

Nicaragua, Salas 20. 1966.

Croton rhamnifolius HBK., Nov. Gen. & Sp. 2: 75. 1817.

"The typical form of the species has a wide distribution in tropical America", Fl. Costa Rica 606. 1937.

Mexico, Costa Rica (US), W. I., S. A.

Hairs on upper surface of blades stellate. (Angelo). A report that they are simple is in error. Blades entire or nearly so. Petioles 1-2 cm long, although sometimes reported as elongate and sometimes as short. Blades ovate, 4-7 cm long, acute, densely stellate-tomentose beneath.

Croton schiedeana Schlechter, Linnaea 19: 243, fig. 9(E). 1847.

This species is sometimes treated as a synonym of *Croton glabellus* L.

Mexico (FLAS), British Honduras (FSU), Costa Rica (FSU,

MO, US), Panama (US). Costa Rica, Prov. Cartago, Turrialba. Godfrey 66183 (FSU), fig. 14, p. 9.

Nicaragua: Dept. Matagalpa, Calabazas. Seymour 2589 (ENAG, FLAS, MO, SEYM, SMU).

Racemes conspicuously long (6-12 cm) with flowers fallen except at tip.

Croton segoviarum Standley & Williams, Ceiba 3: 211. 1953.
Honduras (US).

Nicaragua, Dept. Jinotega. Standley 9620: type (F); dupl. (EAP). Cited with original description.

Dept. Esteli. Condega. Standley 20375.

Esteli. Standley 20209, 20277.

The numbers above cited with the original description.

Dept. Esteli, Pueblo Nuevo. Williams & Molina 42390 (US), fig. 33, p. 23.

Similar to *Croton cortesianus* but young twigs hispid, lacking dark hairs.

Croton simiarum Standley & Williams, Ceiba 3: 212. 1953.

Nicaragua, Dept. Jinotega, E of Jinotega. Standley 10824; Type (F); dupl. (EAP).

Croton skutchii Standley, Field Mus. Bot. 22: 86. 1940.

Costa Rica, Prov. San Jose, vicinity of El General. Skutch 4377 (MO), co-type. Examined. Slender tree 27 m, staminate flowers white. In clearings.

Croton steyermarkianus Croizat, Journ. Arn. Arb. 21: 86. 1940.

Inflorescence terminal. Glands not surely discernible.

Type: Costa Rica. Skutch 1936 (US).

Capsule tomentose, not hispid.

Croton suyapensis Molina, Ceiba 1: 259. 1951.

British Honduras, El Cayo District, Mountain Pine Ridge.

McDaniel 14462 (FSU). Honduras (US).

Nicaragua: Dept. Matagalpa, Matagalpa. Molina & Molina 30501 (MO).

Axis of inflorescence densely hispid. Blades palmately veined. (Angelo).

Croton tenuicaudatus Lundell, Phytologia 1: 451. 1940.

For description, see Fl. Panama 54: 253. 1967.

Costa Rica (MO), Panama.

Croton tonduzii Pax in Pittier, Prim. Fl. Costaricensis 2: 330, 1900.

Costa Rica (MO, US); endemic.

Blades with 3 main nerves at base and 2 weak ones. Pistillate spikes 10-20 cm long. No staminate spikes available. Angelo. Blades have been described as having a "pubescence of minute scales". It might easily be said that the pubescence is of stellate hairs beneath, almost glabrous above. Petioles 3.5-6 cm long. Fruit and flower-buds essentially sessile. Capsules with hairs similar to those on leaves, 5-7 X 10-12 mm. Angelo.

Croton trinitatis Millsp., Field Mus. Bot. 2: 57. 1900.

Croton tragioides Blake, Contr. U. S. Nat. Herb. 24: 11. 1922.

Mexico, British Honduras, Costa Rica (US), Panama (FLAS, FSU, US). Panama, Prov. Panama, Canita. Tyson & Smith 4139 (FSU), fig. 2, p. 6.

Nicaragua:

Dept. Zelaya, Comarca del Cabo, Bilwaskarma. Seymour 5860 (ENAG, FLAS, GH, MO, SEYM, SMU).
Puerto Cabezas. Molina 14761 (US).
Waspan. Atwood 3623 (SEYM).

Dept. Chontales, San Miguelito. Shank & Molina 4587 (US).
Santo Tomas. Seymour 6311 (SEYM, MO).

Dept. Rio San Juan, Castillo. Atwood & Nelson 5181 (ENAG, MO, NY, SEYM, SMU).

Croton triumfettoides Croizat, Journ. Arn. Arb. 21: 87. 1940.

In the Fl. of Panama, this species is treated as a synonym of Croton panamensis.

Type of C. triumfettoides: Costa Rica. Lankester K26 (A).
Costa Rica (MO), Brazil (MO).

Glands of petiole conspicuous, stipitate, about 2 mm long. Head of gland varies from disk-shaped to nearly cylindrical. Inflorescence terminal. Angelo.

Croton verapazensis Donn. Smith, Bot. Gaz. 54: 242. 1912.

Type: Guatemala, Santa Rosa. Tuerckheim 11.2297.

Mexico (US); Chiapas. Webster, Miller & Miller 12966 (MO).
One large blade, coarsely toothed. Petioles 2.5-4 cm long. Flowers clustered.

Croton xalapensis HBK., Nov. Gen. & Sp. 2: 85. 1817.

Croton pseudo-xalapensis Croizat, Journ. Arn. Arb. 21: 85. 1940.

Croton pseudo-xalapensis var. cobanensis Croizat, Journ. Arn. Arb. 21: 86. 1940.

Endemic in Mexico, Croizat, Journ. Arn. Arb. 21: 86. 1949.

Included here with hesitation because of many reports of its occurrence in Central America.

Mexico (FSU), Guatemala, Honduras (FSU, MO), Salvador, Costa Rica.

Mexico, Municipio Ixtapa. Breedlove 11871 (FSU), fig. 34, p. 23.

Essentially pinnately nerved, Ceiba 1: 150. 1951.

Fruiting pedicels none or 1 mm long. Blades stellate-hairy above and beneath, sometimes rather densely beneath, 5-10(-13) cm wide. Inflorescences not axillary but all terminal. Angelo.

EXCLUDED SPECIES.

Croton draco Schlechter, Linnaea 6: 360. 1831.

Often confused with Croton panamensis. Many specimens from Central America have been so identified, but according to Croizat, it occurs in Mexico only. Journ. Arn. Arb. 21: 87. 1940.

Croton gossypifolius Vahl, Symb. Bot. 2: 98. 1794.

Sometimes reported from Central America, but "essentially a Venezuelan and Trinidad endemic". Croizat, Journ. Arn. Arb. 21: 87. 1940.

DOUBTFUL SPECIES.

Croton turrialva Kuntze, Rev. Gen. 614. 1891 in syn. Oxydectes turrialvae Kuntze, loco cito.

Known with certainty only from original collection, Costa Rica, Volcan de Turrialba. Kuntze 2238.

NEW SPECIES.

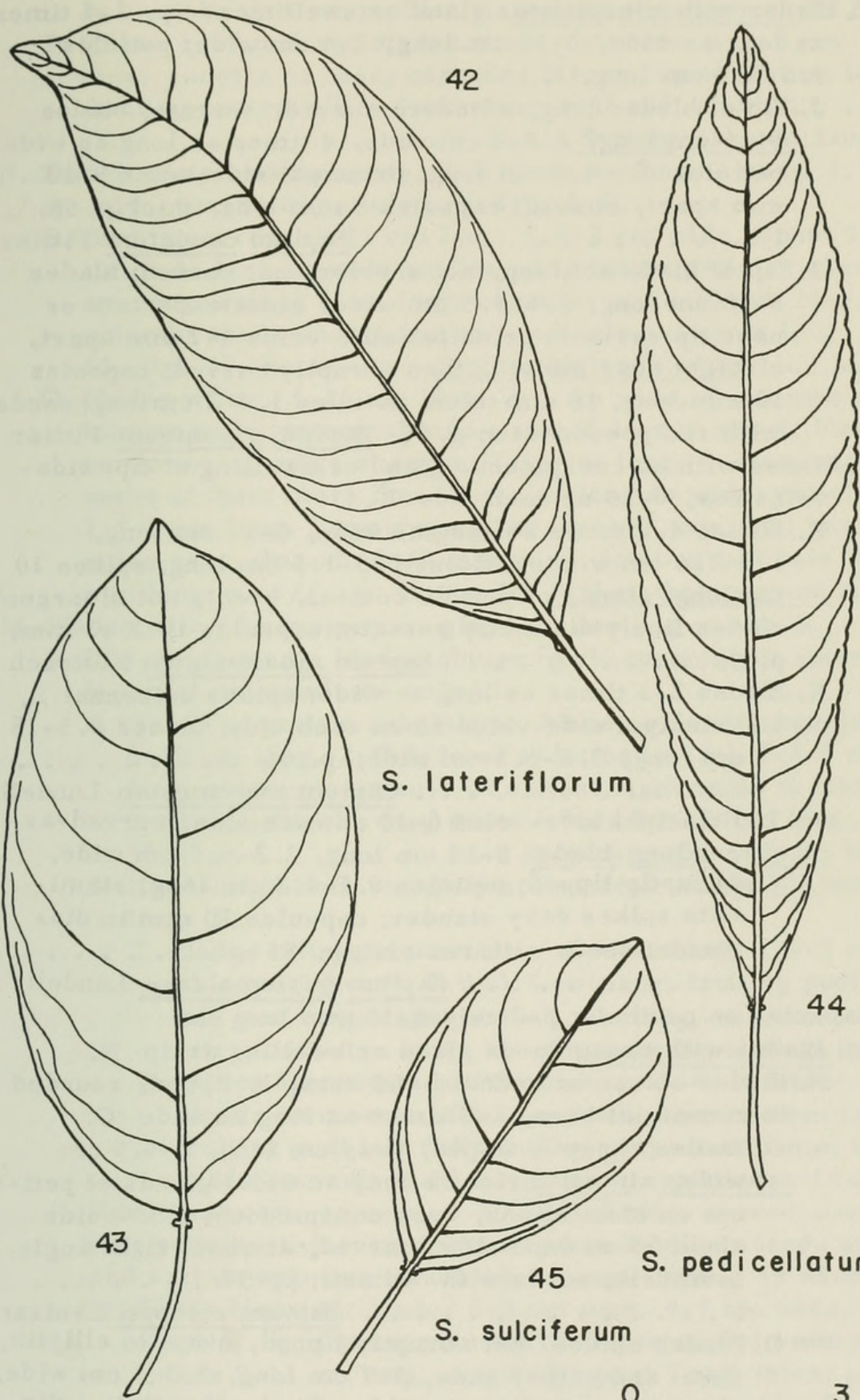
Acalypha chordantha F. Seymour, pp. 17, 29.

Croton atwoodianus F. Seymour, pp. 12, 37.

Croton fantzianus F. Seymour, pp. 10, 39

SAPIUM: KEY TO SPECIES
IN CENTRAL AMERICA

- A. Spikes more than 1 on the same twig B.
- B. Side-veins many, at almost right angles to midrib, almost straight near midrib; blades 9-12 cm long, 3-5 cm wide C.
- C. Blades at tip bearing a gland or swelling, acuminate; principal side-veins 2 mm apart; petioles 2-3 cm long; glands of petiole 2, near summit; p. 54 Sapium aucuparium Jacq.
- C. Blades at tip flat; abruptly, shortly acuminate; principal side-veins 2-3 mm apart; petioles 4 cm long; spike up to 15 cm long; p. 55 Sapium jamaicense Sw.
- B. Side-veins arched-ascending D.
- D. Blades 10-20 cm long, 4-8 cm wide, 2.5 times as long as wide; side-veins 11-17 on each side, 5-15 mm apart; glands of petiole conic; spikes, at least some of them, borne singly, below summit of twig; p. 55, fig. 42, p. 51 Sapium lateriflorum Hemsley
- D. Blades 5-8 cm long, 2.5-4 cm wide, twice as long as wide; principal veins 12-13 on each side, 4-10 mm apart; glands of petiole cylindric, very close to attenuate base of blade; spikes in clusters, (2-) commonly 4 at or near summit of twig; p. 57, fig. 45, p. 51 Sapium sulciferum Pittier
- A. Spike 1 on a twig, terminal E.
- E. Petioles with no glands near summit; glands sometimes on blades F.
- F. Petioles 5-8 mm long; blades lanceolate or oblanceolate, 8-11 cm long, 2.5-3.5 cm wide, 3 or more times as long as wide, caudate-acuminate; glands saucer-shaped on upper surface of blade at base; p. 58 Sapium tuerckheimianum P. & H.
- F. Petioles 1.5-3 cm long; blades widely elliptic, less than 3 times as long as wide G.
- G. Blades with no glands above and no more than a vestige of glands on base beneath, 13-18 cm long, 5-7 cm wide, more than 2 times as long as wide; p. 55 Sapium eglandulosum Ule
- G. Blades with 2 glands on margin at base, 5-7 cm long, 4-5 cm wide, less than 2 times as long as wide; p. 57 Sapium pittieri Huber
- E. Petiole with 2 glands near summit H.



S. lateriflorum

44

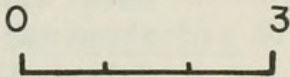
S. pedicellatum

45

S. sulciferum

43

S. pachystachys



H. Capsules sessile or subsessile I.

I. Blades with conspicuous gland or swelling at tip, 2-4 times as long as wide, 5-16 cm long, 2-4 cm wide; petioles 1.5-4.5 cm long J.

J. Tip of blades long, slender, curved, serrate; blades 9-16 cm long, 2.3-4 cm wide, 4 times as long as wide; petioles 2-4.5 cm long; principal side-veins 8-10 mm apart, curved; capsules 5 mm long, thick; p. 55. .

. Sapium caudatum Pittier

J. Tip of blade not long, not slender, not curved; blades 5-12 cm long, 2.5-3.5 cm wide, sinuate-dentate or near tip serrate; principal side-veins 4-7 mm apart, straight near midrib, then abruptly curved; capsules 10 mm long, 15 mm thick; petioles 1.4-2 cm long; seeds with red pseudo-aril; p. 55 Sapium giganteum Pittier

I. Blades with no conspicuous gland or swelling at tip; side-veins few, 6-15 on each side K.

K. Blades 4-5 times as long as wide, 6-13 cm long, 1.3-2.5 cm wide; petioles 0.5-1.5 cm long; spikes 10 cm long; glands of petiole conical, erect, not divergent; blades finely distinctly serrate; capsules 10 X 13 mm; p. 56 Sapium moritzianum Klotzsch

K. Blades 2-3 times as long as wide; spikes unisexual L.

L. Principal side-veins 15 on each side; blades 8.5-18 cm long, 3.5-6.5 cm wide; p. 56

. Sapium mammosum Lundell

L. Principal side-veins 6-10 on each side, curved-ascending; blades 8-15 cm long, 2.2-6.5 cm wide, abruptly tipped; petioles 0.5-1.3 cm long; staminate spikes very slender; capsules 10 mm in diameter; seeds with red aril; p. 55

. Sapium guatemalense Lundell

H. Capsules on pedicels; pedicels 5-10 mm long M.

M. Blades with conspicuous gland or swelling at tip N.

N. Blades obtuse or rounded and abruptly tipped, rounded to cuneate at base, 2-3 times as long as wide O.

O. Blades abruptly tipped, 6-11 cm long, 2-4.5 cm wide, almost thrice as long as wide; glands of petiole on stout stipes, very conspicuous; side-veins about 15 on each side, curved, at about right angle to midrib; seeds with red aril; p. 57

. Sapium schippii Croizat

O. Blades obtuse, not abruptly tipped, ovate to elliptic, short and rather wide, 3-7 cm long, 1.3-3 cm wide, about twice as long as wide; glands of petiole cylindrical P.

- P. Spikes up to 14 cm long; blades ovate, 2-3 cm wide, widely cuneate at base; p. 56 . . . Sapium oligoneurum S. & P.
- P. Spikes 1-3 cm long; blades mostly obovate, 1.3-3 cm wide, cuneate at base; capsules larger, up to 13 mm long; fruiting pedicels 2.5-4 mm long; aril red; p. 55
 Sapium itzanum Lundell
- N. Blades acute or acuminate, 3-5 times as long as wide, 1.5-4 cm wide; glands of petiole cylindrical Q.
- Q. Blades narrow, 8-11 cm long, 1.5-2 cm wide, about 5 times as long as wide on flowering twigs; petioles about 1 cm long; spikes 8 cm long; capsules up to 10 mm long, smooth; seeds warty; fruiting pedicels 5-10 mm long; p. 55, fig. 41, p. 54 . . . Sapium biglandulosum (L.) M. A.
- Q. Blades wider, 5-16 cm long, 2-4 cm wide, 2-4 times as long as wide; principal side-veins 7-11 mm apart; blades on flowering twigs obovate, 7-14 cm long, 2-4 cm wide; some of them more than thrice as long as wide; petioles 1.5-3 cm long; flowering spikes up to 22 cm long; capsules pear-shaped, 8-12 mm thick; fruiting pedicels 4-5 mm long; p. 57, fig. 46, p. 54 Sapium thelocarpum S. & P.
- M. Blades with no conspicuous gland or swelling at tip R.
- R. Side-veins many; blades obtuse to sharp-pointed; spikes bisexual or staminate only S.
- S. Glands of petiole subglobose; blades oblong-lanceolate, 6-12 cm long, 2.5-3.5 cm wide; petioles 2.5-3.5 cm long; side-veins many, at almost right angle to midrib; fruiting pedicels very short; seeds 10-13 mm long; p. 56 Sapium macrocarpum M. A.
- S. Glands of petiole elongate-cylindrical; seeds 5-7 mm long T.
- T. Blades elliptic-lanceolate, 4-9 cm long, 1.5-3 cm wide; petioles (0.5-)1-3.5 cm long; fruiting pedicels 6-8 mm long; capsules 6-8 mm long; seeds tuberculate; p. 57, fig. 44, p. 51 Sapium pedicellatum Huber
- T. Blades lanceolate, 7-18 cm long, 3-6 cm wide; glands on margin of blade; petioles up to 4 cm long; fruiting pedicels 5-7 mm long; capsules 10 mm long; seeds smooth; p. 55 . . . Sapium izabalense Lundell
- R. Side-veins few, remote, 6-10 on each side, curved-ascending; petioles 1-3.5 cm long; stigmas 2-lobed; seeds with red aril or unknown; blades 2-3 times as long as wide U.
- U. Spikes bisexual; blades 8-9 cm long, 4-5 cm wide, oval-elliptic, tip obtuse; principal side-veins 6-14 mm apart; spikes 8-13 cm long, staminate part 7 mm thick; p. 57, fig. 43, p. 51 Sapium pachystachys S. & P.

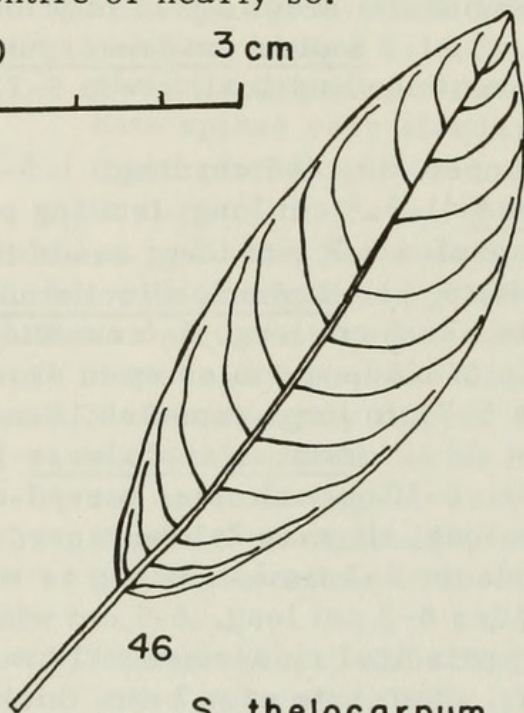
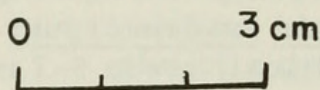
U. Spikes unisexual; blades 8-18 cm long, obovate to elliptic-oblong, acute or rounded at base, usually shiny, tip obtuse; side-veins remote; capsules 8 mm in diameter, on short thick pedicels; seeds 6 mm in diameter; p. 56 Sapium nitidum (Monachino) Lundell

SAPIUM IN CENTRAL AMERICA
ANNOTATED LIST

Sapium aucuparium Jacq., Enum. Pl. Carib. 31. 1760; non Jacq., Select. Amer. Hist. 249, pl. 158. 1763.
For description, see Ann. Mo. Bot. Gard. 54: 324. 1967.
The nomenclature is complicated by Jacquin's using this name for one species in 1760 and for a different species in 1763.
See Croizat, Journ. Arn. Arb. 24: 174-5. 1943.
Costa Rica (MO), Panama (US), Cuba (FLAS).

Sapium biglandulosum (L.) Muell. Arg., Linnaea 32: 116. 1863.
Sapium aucuparium Jacq., Select. Amer. Hist. 249, pl. 158. 1763, non 1760.
British Honduras, Panama (FSU, US). Type: Panama (US).
Panama, Prov. Los Santos, Las Tablas. Dwyer 2495 (FSU), fig. 41, p. 54.

Easily recognized by narrow blades, and petioles 5-10 mm long. Angelo. Fruiting pedicels 5-10 mm long. Blades entire or nearly so.



S. thelocarpum



S. biglandulosum

Sapium biglandulosum, continued.

I have seen no specimen in which the blades were "coarsely crenate".

Sapium caudatum Pittier, Contr. U. S. Nat. Herb. 20:127. 1918.

Type: Panama, Canal Zone, Gamboa. Coll. Pittier (US).

Glands of petiole 2; gland or swelling sometimes at tip of blade.

Sapium eglandulosum Ule, Bot. Jahrb. 35: 673, fig. 2A. 1905.
Panama.Sapium giganteum Pittier, Contr. U. S. Nat. Herb. 20: 128.

1918. Type: Panama, Prov. Colon, near Fato. Pittier 414 (US).

"Closely allied to *S. caudatum*" but leaves smaller, apical appendages longer, more slender. Capsules sessile, 10 mm long, 15 mm in diameter; pseudo-aril red; seeds 5 X 5.8 mm.

Sapium guatemalense Lundell, Wrightia 5(4): 76. 1975.
Guatemala.Sapium itzanum Lundell, Wrightia 5(4): 77. 1975. Guatemala.Sapium izabalense Lundell, Wrightia 5: 346. 1977. Guatemala.Sapium jamaicense Sw., Adnot. Bot. 62. 1829.

Sapium anadenum Pittier, Contr. U. S. Nat. Herb. 12:164. 1908. *Sapium pleiostachys* Schumann & Pittier in Pittier, Contr. U. S. Nat. Herb. 12:164. 1908.

Mexico, Guatemala, Honduras, Costa Rica (FSU),
Panama (FSU), Jamaica, Cuba (FLAS).

Blades 15-17 cm long, 5-7 cm wide. Side-veins many but not close, ca. 5 mm apart. Pflanzenreich 52: 205.

As there is much misunderstanding of this species, I quote from Fawcett & Rendle in Fl. Jamaica 2: 325. 1920. Leaves oblong-elliptical or elliptical; petioles with small sessile oblong glands; spikes in axils of topmost leaves at apex of branch; ovary sessile. Quoted by Fawcett & Rendle who add: Leaves 7-22 cm long, oblong-elliptical or elliptical, apex rounded, abruptly shortly acuminate, base obtuse to wedge-shaped, margin entire or wavy or obscurely denticulate nerves numerous (to thirty on each side), about 2 mm apart, bending upwards near margin, prominent; petiole 4 cm long ... Spikes ... to 15 cm long ... Capsule globular, 7-8 mm in diameter. Seed about 4 mm long, roundish-lens-shaped, roughly net-veined.

Sapium lateriflorum Hemsley in Hook. Icon. sub pl. 2680. 1901.

Type: Mexico (US).

Mexico (MO), British Honduras, Guatemala, Costa Rica (FSU).
Cuba, Trinidad Mountains, San Blas-Buenos Aires. Gonzales 586 (FLAS), fig. 42, p. 51.

Side-veins 10 mm apart. Blades large or small. Glands of petiole 2, wide at base. Gland or swelling none at tip of blade.

Sapium macrocarpum Muell. Arg., Linnaea 32: 119. 1863.

Sapium mexicanum Hemsley in Hook. Icon. Pl. IV, 27, pl. 2680. 1901.

Mexico, Guatemala.

Glands of petiole subglobose; none at tip of blade. Side-veins about 1 cm apart. Seeds nearly 1 cm long. Contr. U. S. Nat. Herb. 23: 652. 1923.

Sapium mammosum Lundell, Wrightia 5(4): 77. 1975.

British Honduras.

Sapium moritzianum Klotzsch, Seem. Bot. Voy. Herald 100.

1853. Synonym of Sapium biglandulosum (L.) Muell. Arg. according to Fl. Panama 54: 327. 1967. Pittiermadeita var. of Sapium aucuparium Jacq., 1763, non 1760. Contr. U. S. Nat. Herb. 20: 128. 1918. But spikes are terminal, solitary, and side-veins are arcuate.

Blades linear, 7-8 mm wide, but description, Contr. U. S. Nat. Herb. 20 says 1.5-2.5 cm wide. Glands of petiole conical. Stipules fimbriate, reniform.

Sapium nitidum (Monachino) Lundell, Amer. Midl. Nat. 29: 477. 1943.

Guatemala (US), Honduras (FLAS).

Side-veins 1.5 cm apart.

Sapium oligoneurum Schumann & Pittier, Contr. U. S. Nat. Herb. 12: 168, pl. 17. 1908.

Mexico, Guatemala, Honduras, Salvador, Costa Rica (MO).
Nicaragua: Dept. Granada, Mombacho Volcan. Maxon, Harvey and Valentine 7806 (US).

Blades elliptic, sometimes distinctly toothed. Side-veins 5-10 mm apart. Blades 3-7 cm long, 2-3 cm wide.

It is doubtful whether S. oligoneurum and S. sulciferum are distinct species. Having 1 or more than 1 spikes on the same

twig may be a variation within the same species.

Sapium pachystachys Schumann & Pittier, Contr. U. S. Nat. Herb. 12: 168, pl. 16. 1908.

Costa Rica (MO), Panama. Costa Rica, Prov. Heredia, Sarapiquí, Hartshorn 1025 (MO), fig. 43, p. 51; Hartshorn 1001 (MO).

Nicaragua: Dept. Chinandega, Chinandega. Maxon, Harvey & Valentine 7186 (US).

Sapium pedicellatum Huber, Bull. Herb. Boiss. II, 6:352. 1906.

Mexico, Salvador (especially), Honduras, Costa Rica (MO). Mexico, State Colima, Santiago to Huizcolate. Stevens & Fairhurst 1858 (MO), fig. 44, p. 51.

For description, see Contr. U. S. Nat. Herb. 23:651. 1923.

Sapium pittieri Huber, Bull. Herb. Boiss. II, 6: 35. 1906.

Costa Rica. Glands on base of leaf are distinctive.

Side-veins distant, 10-15 mm apart. Blades oblong, 10-18.5 cm long, 6-8 cm wide.

For description, see Pittier, Contr. U. S. Nat. Herb. 12: 169. 1908.

Sapium schippii Croizat in Lundell, Amer. Midl. Nat. 29: 477.

1943. Known from the type only: British Honduras, near sea-level, Toledo District, Forest Home. Schipp 1049.

Sapium sulciferum Pittier, Contr. U. S. Nat. Herb. 12: 169.

1908. Type: Costa Rica, La Palma. Tonduz 12428 (US).

Honduras)FLAS), Costa Rica (MO).

Nicaragua: Dept. Granada, Volcan Mombacho. Atwood 77147 (FSU, SEYM).

Dr. Lyman B. Smith of the U. S. National Herbarium has very kindly examined the type specimen of *Sapium sulciferum* Pittier in that herbarium and informed me "that it had 4 spikes on branchlets." 7 Sept. 1978. See note under *Sapium oligoneurum*.

Sapium thelocarpum Schumann & Pittier, Contr. U. S. Nat.

Herb. 12: 166, pl. 13. 1908.

Costa Rica, La Verbena, near San Jose. Tonduz US 578901 (US); type.

Nicaragua:

Dept. Esteli, Llano 4 de Mayo. Neill 7353 (GH, MO, SEYM, SMU, UCA), fig. 46, p. 54.

Road to Cusmapa. Atwood & Neill AN273 (MSC, SEYM).

Cerro Santa Rosa. Neill 7787 (MO, SEYM, SMU, UCA).

Dept. Matagalpa, Between Aranjuez and Peor es Nada. Molina 22969 (MO).

Dept. Chontales, Santo Tomas. Neill 7398 (GH, MO, SEYM, SMU, UCA).

Dept. Managua, Casa Colorada. Maxon, Harvey & Valentine 7460 (US).

To clarify an understanding of this species, I quote from the original description by Schumann & Pittier, loco cito; "leaves of floral twigs ...long cuneate or rounded at base ..." In the accompanying photographic illustration, plate 13, the leaves might be called attenuate or acuminate at base. Further, the original description reads "larger secondary nerves rather distant, arcuate, forming a fine, prominent network"

Sapium tuerckheimianum Pax & Hoffmann, Pflanzenreich IV, 147, xiv, 68:61. 1919.

Known from the type only: Guatemala, Cubilquitz, Alta Verapaz. Tyerckheim II. 941.

ABBREVIATIONS not already in common use.

Bth., Bentham

ENAG, Herbarium of the Escuela Nacional de Agricultura y Ganaderia, Managua, Nicaragua

Is., island

M. A., Muell. Arg.

P. & H., Pax & Hoffmann

S. A., South America

SEYM, Herbarium of Frank C. Seymour

S. & P., Schumann & Pittier

S. & W., Standley & Williams

UCA, Herbarium of the Universidad Centro-americana, Managua, Nicaragua

WDP, Herbarium of St. Norbert College, West De Pere, Wis.

W. I., West Indies

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