

BALSAMINACEAE

Herbs with succulent stems. Leaves alternate or opposite, simple, without stipules. Flower zygomorphic, brightly colored; dorsal sepal petaloid with a long spur, 2 lateral sepals small, green, the other 2 sepals tiny or absent; petals 5, the lateral ones united; stamens 5, united by their filaments; pistil 1, the carpels 5, united; ovary superior. Fruit dehiscent elastically.

Impatiens balsaminea L.

Plate 118-B

Erect, branched, succulent herb, to 80 cm tall. Leaves serrate, elliptic. Flowers variable in color, usually white, pink or red. Cultivated around homesites and escaped on rocky beaches. Tropical Asia; cultivated and escaped in the neotropics.

Common name: "Chana"

BEGONIACEAE

Succulent herbs or vines, creeping or erect; stems jointed. Leaves alternate, simple, the base oblique; with stipules. Flowers unisexual; staminate flowers composed of 2 large sepals and 2 small petals, with many stamens; pistillate flower with 2 to many sepals; ovary and fruit winged.

Key to the species.

1. Leaves large (more than 4 cm wide), slightly asymmetrical; inflorescence terminal, large and many-flowered *Begonia glabra*
1. Leaves small (to 3 cm wide), extremely asymmetrical; inflorescence axillary, small and few-flowered *Begonia semiovata*

Begonia glabra Aubl.

Plate 118-C

Large, epiphytic, vining herb. Leaves slightly asymmetric, remotely serrate, to 35 × 10 cm. Inflorescence large, terminal, much branched. Flowers white. Common, in mature forest. Southern Mexico and the West Indies to Bolivia.

Begonia semiovata Liebm.

Plate 118-D

Terrestrial herb. Leaves extremely asymmetric, serrate, to 8 × 3 cm, red on the underside. Inflorescence small, few-flowered, axillary. Flowers white. Infrequent, along the river bank and in mature forest. Mexico and the Guianas to Peru.

BIGNONIACEAE

Trees or lianas, sometimes hemi-epiphytic; stems of lianas usually with various cross-shaped patterns in cross-section. Leaves simple or compound, fasciculate or opposite, often tendrillate in vines. Inflorescence racemose, paniculate, or solitary and cauliflorous. Flowers large, showy; calyx cup-shaped or bilabiate; corolla tubular-campanulate to tubular; stamens usually 4, a posterior staminode also present. Fruit a dehiscent capsule with winged seeds, or indehiscent and baccate, or hard-shelled.

Potable water can be obtained from the cut stems of many of the vines which are collectively known as "bejuco de agua".

Key to the species.

1. Leaves fasciculate in alternate clusters, simple; calyx bilabiate split to the base; flowers solitary from the trunk or larger branches *Crescentia cujete*
1. Leaves opposite, simple or compound; calyx cupular or shallowly bilabiate; inflorescence racemose or paniculate.
 2. Trees; leaves palmately compound.
 3. Leaves 5-foliolate; inflorescence short, corymbose-paniculate, without a central axis; fruits not costate; native *Tabebuia chrysantha*
 3. Leaves 7-foliolate; inflorescence with a well-developed, straight, central axis; fruits prominently costate; cultivated *Tabebuia donnell-smithii*
 2. Vines (sometimes hemi-epiphytic); leaves simple or 2-to 3-foliolate.
 4. Leaves simple; hemi-epiphytic; fruit a globose berry.
 5. Inflorescence with foliaceous bracts, mostly terminal; corolla lobes more than 3 mm long, reflexed . . . *Schlegelia darienensis*
 5. Inflorescence without foliaceous bracts, usually more or less cauliflorous; corolla lobes 2 mm long, hardly reflexed *Schlegelia sulfurea*
 4. Leaves 2-to 3-foliolate; tendrillate lianas; fruit dehiscent.
 6. Branchlets hexagonal with ribbed angles; tendrils trifid or multifid.
 7. Corolla white, the lobes reflexed; fruit echinate; vegetative trichomes simple. *Pithecoctenium crucigerum*
 7. Corolla magenta, the lobes loosely fused at anthesis, not reflexing; fruit smooth; vegetative trichomes stellate or dendroid in part *Amphilophium paniculatum*
 6. Branchlets terete; tendrils simple to trifid.
 8. Flower yellow; tendrils trifid; fruit elliptic.
 9. Leaves glabrous beneath *Anemopaegma chrysanthum*
 9. Leaves softly puberulous beneath *Anemopaegma puberulum*
 8. Flower magenta; tendrils simple or minutely bifid; fruit linear.
 10. Interpetiolar glandular fields absent; petiolar glandular fields present; pseudo-stipules appressed-conical; fruit valves convex, sandpaper-surfaced *Paragonia pyramidata*

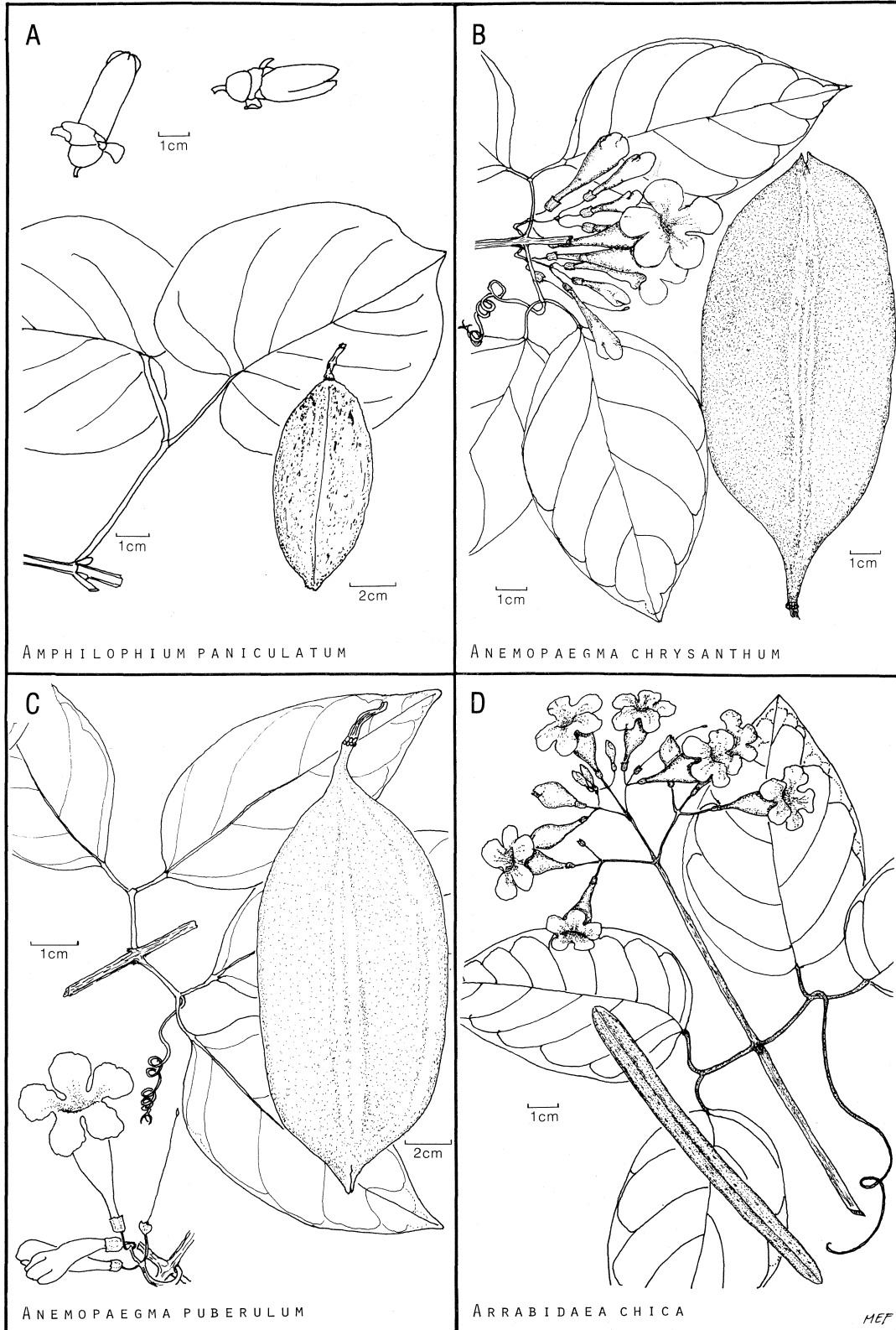


Plate 119

10. Interpetiolar glandular fields present; petiolar glandular fields absent; pseudo-stipules inconspicuous; fruit valves flattened, smooth or verrucose.
11. Corolla campanulate; calyx 5-denticulate; leaves drying red; fruit smooth *Arrabidaea chica*
11. Corolla dorso-ventrally compressed; calyx bilabiate; leaves drying greenish; fruit verrucose.
 *Arrabidaea verrucosa*

***Amphilophium paniculatum* (L.) HBK.**

Plate 119-A

Liana, without interpetiolar glandular fields, the branchlets hexagonal-angled. Leaves 2-foliolate, sometimes with a trifid tendril, the leaflets broadly ovate, obtuse to acuminate at the apex, truncate or subcordate at the base, usually stellate-puberulous along the main nerves. Inflorescence a raceme or racemose panicle; calyx double, with a frilly outer margin; corolla magenta, tubular, bilabiate split, the two lips remaining appressed at anthesis. Fruit elliptic, somewhat compressed, not spiny. Rare, at forest edge. Mexico and West Indies to Argentina.

***Anemopaegma chrysanthum* Dugand**

Plate 119-B

Liana, without interpetiolar glandular fields, the branchlets terete. Leaves 2-foliolate, sometimes with a trifid tendril, the leaflets ovate to ovate-elliptic, acute, broadly cuneate at the base, glabrous. Inflorescence a few-flowered raceme, the corolla tubular-campanulate, bright yellow. Fruit oblong-elliptic, flattened, narrowed at each end. Uncommon, in mature forest. Southern Mexico to western Ecuador.

***Anemopaegma puberulum* (R. Seibert) Miranda**

Plate 119-C

Liana. Like *A. chrysanthum*, except the leaves softly puberulous below. Rare, in mature forest along creek. Southern Mexico to western Ecuador. The discovery of both this pubescent-leaved plant and the glabrous-leaved one at Río Palenque invalidates the ecologic argument for their taxonomic separation which was cited in the Flora of Ecuador. Although it now seems probable that they will prove conspecific, we have maintained their traditional separation.

***Arrabidaea chica* (H. & B.) Verl.**

Plate 119-D

Liana, with interpetiolar glandular fields, the branchlets terete. Leaves 2- to 3-foliolate, sometimes with a simple tendril, the leaflets ovate, acute to acuminate, rounded at the base, drying red, glabrous except in the axils of the lateral nerves beneath and sometimes on very young branchlets. Inflorescence a terminal panicle; calyx cupular, ca. 4 mm long; corolla magenta with a white throat, tubular-campanulate, puberulous outside. Fruit linear, compressed, smooth. Infrequent, mostly at forest edge. Mexico to Brazil and Argentina.

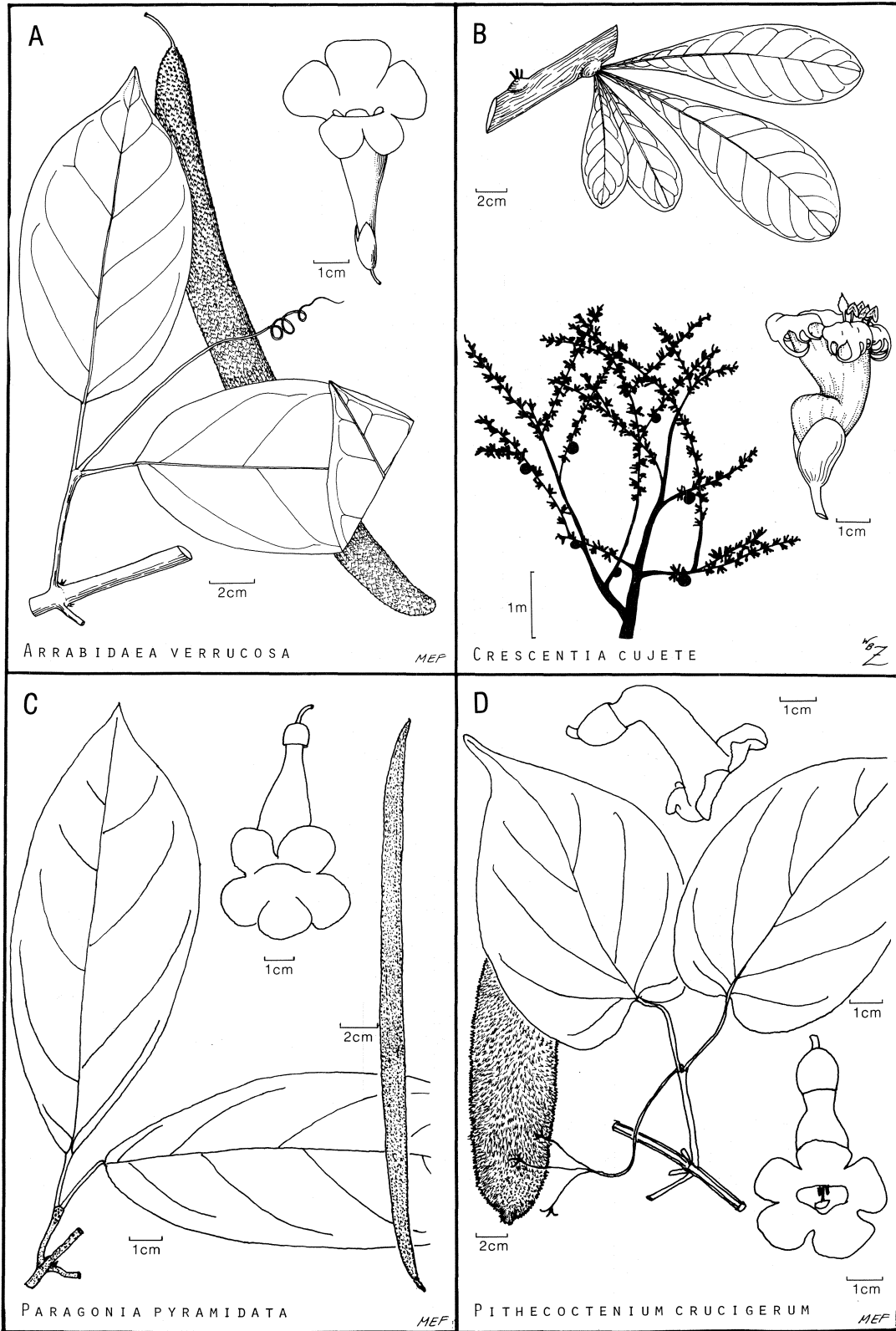


Plate 120

Arrabidaea verrucosa (Standl.) A. Gentry

Plate 120-A

Scobinaria verrucosa (Standl.) R. Seibert

Liana, with interpetiolar glandular fields, the branchlets terete. Leaves 2-foliolate, sometimes with a simple tendril, the leaflets ovate, acute to acuminate, rounded at the base, glabrous except in and near the axils of the lateral nerves beneath. Inflorescence a few-flowered panicle, usually axillary; calyx bilabiate, ca. 2 cm long; corolla dark magenta with a white throat, dorsally compressed, puberulous outside. Fruit linear-oblong, verrucose-surfaced. Common, in mature forest. Belize to Bolivia.

***Crescentia cujete** L.

Plate 120-B

Small tree with crooked branches. Leaves simple, fasciculate, sometimes alternate on young branchlets, obovate, obtuse to acute, cuneate at the base. Flowers borne singly on the trunk or the branches; calyx bilabiate split to the base; corolla tannish with reddish venation, campanulate with a transverse fold in the throat. Fruit large, globose, to 30 cm in diameter, the shell hard, the seeds embedded in the pulp. Cultivated throughout the neotropics, probably native to northern Central America. Fruit shells used for household containers and utensils.

Common name: "Mate"+

Paragonia pyramidata (L. Rich.) Bur.

Plate 120-C

Liana, without interpetiolar glandular fields, the branchlets terete. Petiole with a glandular field at the apex; leaves 2-foliolate, sometimes with a minutely bifid tendril, the leaflets elliptic, acute, more or less rounded at the base, glabrous, with a sweetish odor when crushed. Inflorescence a terminal panicle; calyx irregularly cupular, ca. 5 mm long; corolla magenta with a white throat, tubular-campanulate, puberulous outside. Fruit linear, more or less terete, sandpaper-surfaced. Infrequent, in mature forest. Mexico to Bolivia.

Pithecoctenium crucigerum (L.) A. Gentry

Plate 120-D

P. echinatum (Jacq.) Baill.

Liana, without interpetiolar glandular fields, the branchlets sharply hexagonal. Leaves 2-foliolate, sometimes with a 3- to 15-fid tendril, the leaflets broadly ovate, acuminate, more or less cordate, usually with simple trichomes at least along the mid-vein below. Inflorescence a raceme or panicle; calyx cupular, ca. 10 mm long; corolla white, tubular-campanulate, bent near the middle, pubescent outside. Fruit oblong-elliptic, densely echinate. Infrequent, in mature forest and at forest edge. Mexico to Argentina.

Common name: "Cucharilla"

Schlegelia darienensis Sandw.

Plate 121-A

Hemi-epiphytic liana. Leaves simple, opposite, coriaceous. Inflorescence terminal, elongate, narrowly paniculate, with conspicuous foliaceous bracts. Flowers small, tubular with reflexed lobes almost as long as the tube, lavender. Fruit a spherical berry. Infrequent, in mature forest. Previously reported only from western Colombia.

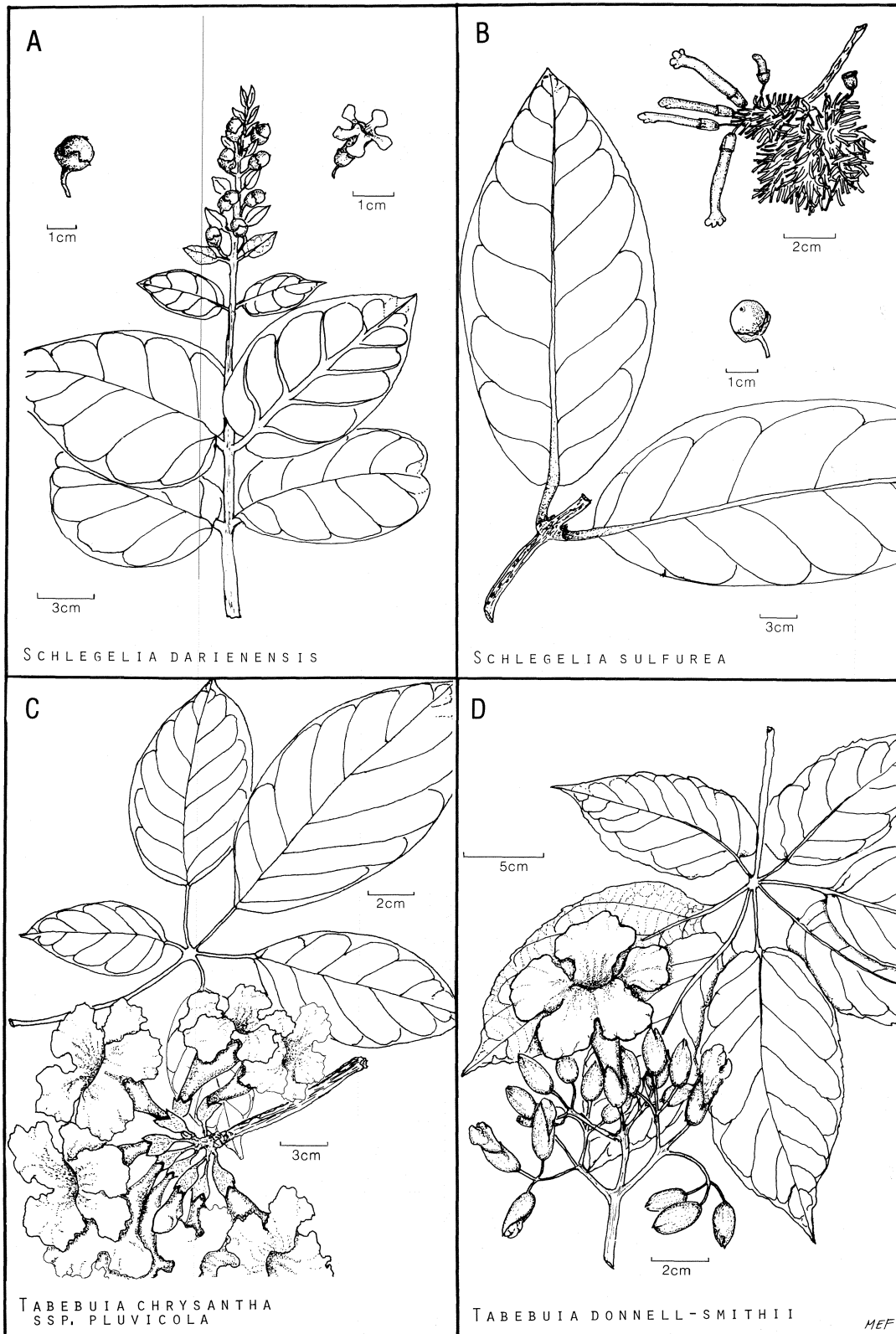


Plate 121

Schlegelia sulfurea Diels

Plate 121-B

Hemi-epiphytic liana. Leaves simple, opposite, coriaceous. Inflorescences fasciculate, congested, somewhat resembling "witches' brooms", the short-lobed, tubular, hummingbird-pollinated flowers cream at the base, shading to magenta on the lobes; calyx magenta. Fruit a spherical berry. Very common, in mature forest. Guatemala to Pacific Ecuador.

Tabebuia chrysantha (Jacq.) Nichols. ssp. **pluvicola** A. Gentry

Plate 121-C

Canopy tree. Leaves palmately 5-foliolate, stellate-puberulous beneath. Inflorescence a short, corymbose panicle. Flower large, yellow, tubular-funnel-shaped. Fruit linear, terete, not costate. Not now known at Río Palenque, but probably formerly present; this is the most important timber tree of the region and the first species to be selected for cutting by timber cruisers. It still occurs further into the mountains, especially north toward Santo Domingo; a dry forest subspecies reaches almost to Quevedo. This species ranges from Mexico to Ecuador.

Common name: "Guayacan"+

***Tabebuia donnell-smithii** Rose

Plate 121-D

Tree. Leaves palmately 7-foliolate, sparsely puberulous with branching trichomes. Inflorescence a terminal panicle with a well-developed central rachis. Flowers large, tubular-infundibuliform, bright yellow. Fruit linear, terete, longitudinally costate. Cultivated as a hedge row near the entrance to the Science Center; native to Central America.

Common name: "Guayacan"

BIXACEAE

Shrubs or small trees with red sap. Leaves alternate, simple, with stipules. Flowers bisexual, regular; sepals 5, free, deciduous; petals 5, pink, free; stamens numerous, free; ovary superior, unilocular. Fruit a capsule with numerous seeds surrounded by a red covering.

***Bixa orellana** L.

Plate 122-A

Small tree or shrub with dense leaves. Leaves ovate, acuminate, truncate to broadly cordate at the base. Inflorescence terminal, paniculate. Petals pink. Fruits spiny, dehiscent to expose the seeds which are surrounded by a greasy, red material. The red material is used as a food coloring and is applied to the hair and body by the Colorado Indians. Cultivated around buildings. Widespread in tropical America.

Common name: "Achiote"+

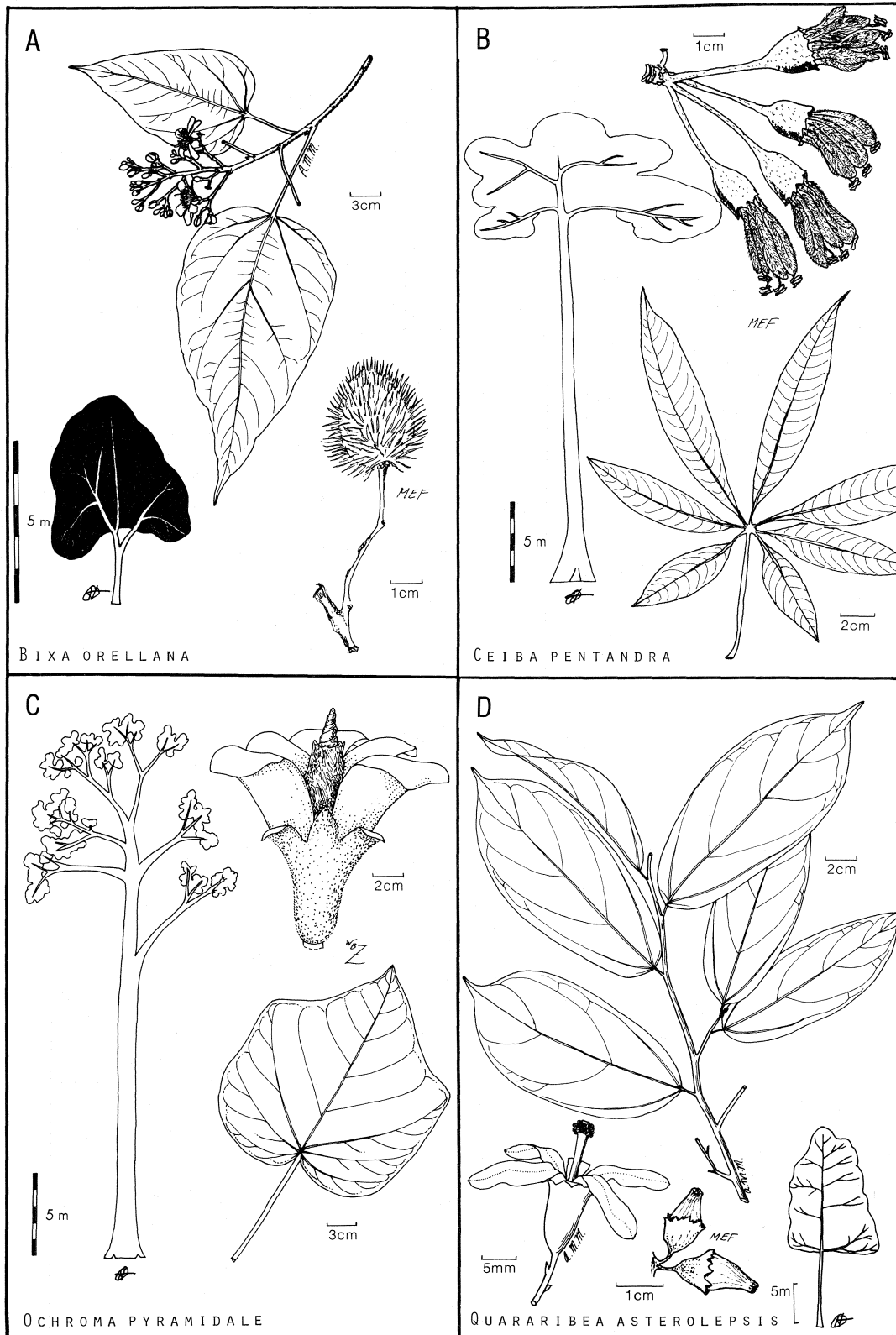


Plate 122

BOMBACACEAE

Trees, often with myristicaceous branching, the trunks sometimes armed. Leaves alternate, simple or digitately compound, the stipules early caducous. Inflorescences cymose, racemose, or the flowers solitary. Flowers usually bracteolate, 5-parted; calyx more or less cupular; petals usually adnate to the base of the staminal column; stamens monadelphous; ovary superior. Fruit a dehiscent capsule or indehiscent.

Mostly canopy and intermediate story species of the mature forest. "Balsa" (*Ochroma pyramidale*) is a common second growth species. Several additional genera and species occur in the vicinity, but presently are not represented at Río Palenque. For example, Pancho Arana, the foreman at the Science Center, remembers cutting down a tree of "Beldaco" [*Pseudobombax millei* (Standl.) A. Robyns] which grew in the pasture.

Key to the species.

1. Leaves palmately compound *Ceiba pentandra*
1. Leaves simple.
 2. Fruits dehiscent, densely lanate inside; flowers large, to 11-15 cm long. *Ochroma pyramidale*
 2. Fruit indehiscent, the mesocarp fleshy to coriaceous; flowers smaller (less than 5 cm long).
 3. Calyx with 5 to 10 longitudinal wings. *Quararibea grandifolia*
 3. Calyx without longitudinal wings.
 4. Leaves conspicuously cordate at the base.
 5. Leaves more or less glabrate above and below *Quararibea cordata*
 5. Leaves strongly stellate-pubescent below.
 6. Leaves suborbicular, broadly cordate; fruit large (to 8.5 cm long), longer than wide, with a persistent calyx 1.5-2 cm long. *Quararibea soegenii*
 6. Leaves oblong to obovate-oblong, narrowed toward the minutely cordate base; fruit small (to 2 cm in diameter), broader than long; calyx circumscissily deciduous *Quararibea palenquiiana*
 4. Leaves truncate to rounded at the base.
 7. Leaves small (less than 17 cm long), the petiole ca. 1 cm long; fruit to 3 cm long. *Quararibea asterolepis*
 7. Leaves large (30-37 cm long), the petiole 6-8 cm long; fruit to 6 cm in diameter. *Quararibea coloradorum*

***Ceiba pentandra* (L.) Gaertn.**

Plate 122-B

Giant tree, with columnar trunk and large buttresses, the trunk spiny when young, the spines caducous at maturity. Leaves palmately 5-to 9-foliolate, the leaflets oblong lanceolate, acuminate, glabrous. Inflorescence fasciculate. Flowers borne irregularly at intervals of several years. Flowers with the subtruncate calyx villous-sericeous inside; petals ca. 3 cm long, villous outside and at the apex inside; staminal column ca. 5 mm long, the filaments each bearing 2-3 1-thecate anthers. Capsule woody, fusiform, dehiscent, the seeds numerous, embedded in copious kapok. Rare, only near trail 3 in Dodson forest. Pantropical.

Common name: "Ceibo"+

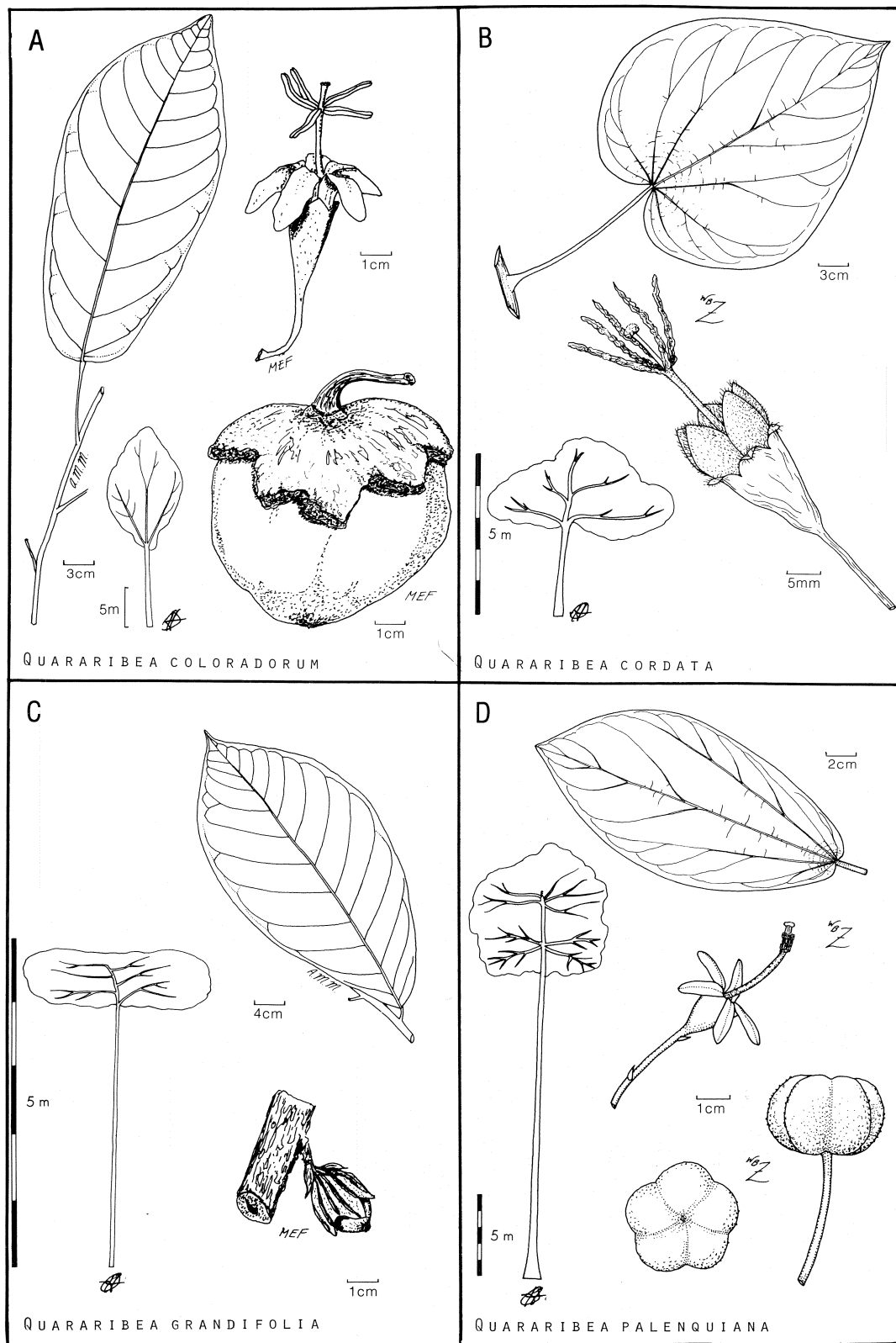


Plate 123

Ochroma pyramidale (Cav. ex Lam.) Urb. Plate 122-C

Small to large tree, to 25 m tall with a columnar unarmed trunk and very light wood. Leaves simple, broadly cordate, usually more or less 3-lobed. Flowers large, solitary, white; calyx irregularly 5-lobate, 8-12 cm long; petals fleshy, 11-15 cm long. Capsule fusiform, 5-angled, ca. 2.5 cm in diameter, the seeds embedded in kapok. Very common, in disturbed areas and in apparently mature forest. Widespread in tropical America.

Common name: "Balsa", "Boya"+

Quararibea asterolepis Pittier Plate 122-D

Canopy tree, to 30 m tall. Leaves elliptic-oblong, acuminate, obtuse and 3-veined at the base, the petiole ca. 1 cm long. Flowers solitary; calyx unwinged, ca. 10 × 7-10 mm in flower; petals white, stellate-pubescent outside, glabrous inside; staminal column undivided. Fruit ellipsoid, orange when mature, 2-2.5 cm long, the lower ¼ enclosed by the enlarged cupular calyx. Infrequent, in mature forest. Ranges north to Costa Rica and may not be distinguishable from *Q. funebris* Vischer of northern Central America.

Common name: "Molinillo"+

Quararibea coloradorum (R. Ben.) Cuatr. Plate 123-A

Medium-sized tree, 10-20 m tall. Leaves oblong, obtuse, truncate at the base, to 30 × 15 cm, pinnately nerved, the petiole 4-9 cm long. Flowers solitary; calyx 5-lobed, ca. 3 cm long; petals purplish; apex of the staminal column 5-lobed. Fruit baseball-sized, 5-seeded, the base enclosed by the expanded calyx. Very common, in mature forest, probably the most common tree at Río Palenque, averaging 12 individuals per 1000 m². Endemic to Pacific Ecuador.

Common name: "Zapote de monte"+ "Dedo"

***Quararibea cordata** (H. & B.) Vischer Plate 123-B

Tree to 10 m tall. Leaves broadly ovate, cordate at the base, more or less glabrous, to 20 cm long and wide, palmately 7- to 9-veined. Flowers fasciculate on the branches. Petals pinkish. Fruits globose, baseball-sized, the base subtended by the expanded calyx, edible. Cultivated near homesites. Native from Panama to Peru but its natural range in western South America is obscure.

Common name: "Zapote"+, "Zapotillo"

Quararibea grandifolia (Little) Cuatr. Plate 123-C

Medium-sized tree, to 15 m tall. Leaves large, 30-60 × 24 cm, pinnately veined, inconspicuously 3-veined at the base, elliptic, the petiole short, ca. 1 cm long. Flowers solitary; calyx with 5 to 10 longitudinal wings (the only Río Palenque species with a winged calyx); staminal column lobed. Uncommon, in mature forest. Known only from Pacific Ecuador.

Common name: "Penimon"

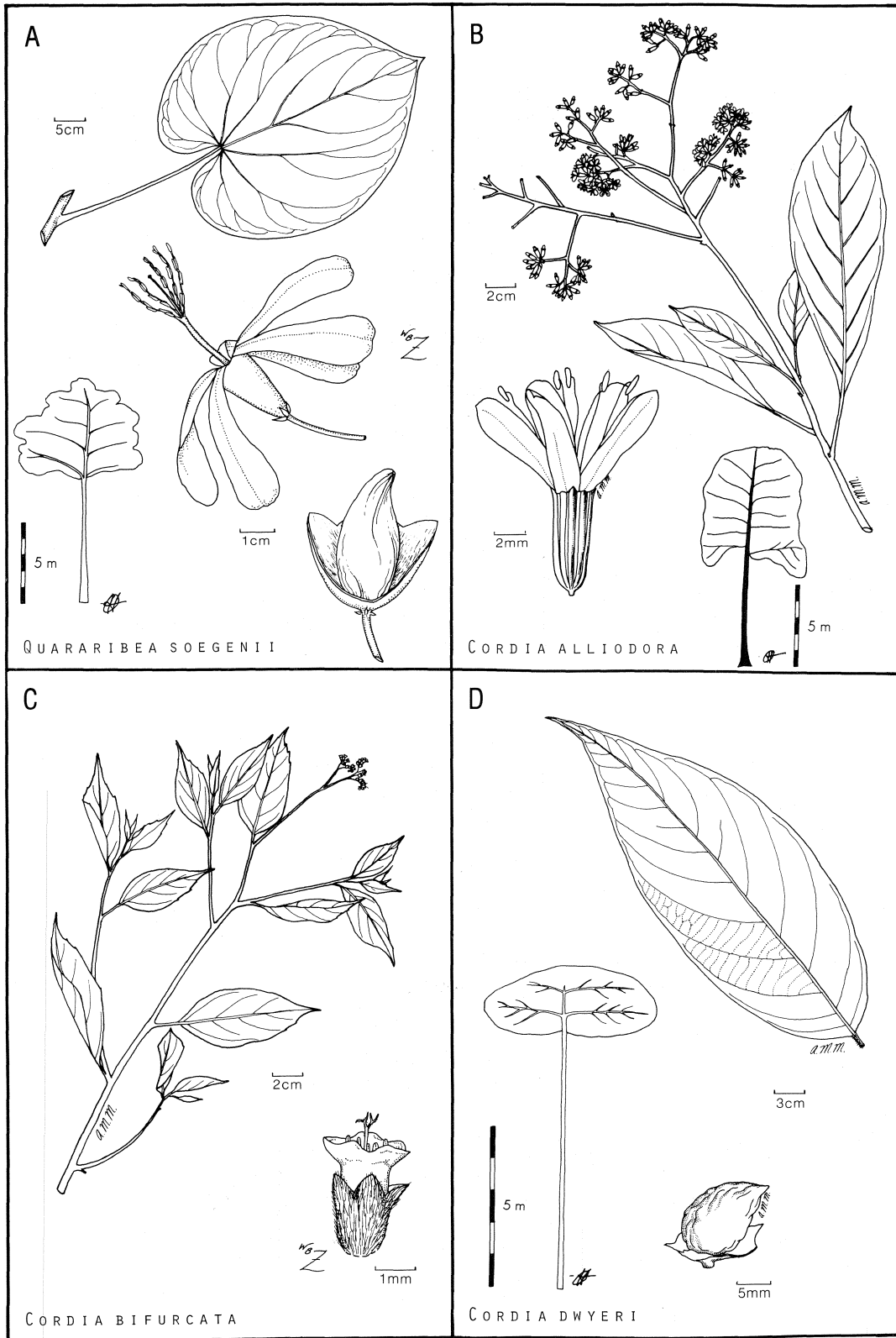


Plate 124

Quararibea palenquiana A. Robyns

Plate 123-D

Large mature forest tree, 30-35 m tall, the trunk smooth, columnar, buttressed. Leaves oblong-obovate, broadest at or above the middle, palmately 5- to 9-veined, narrowing toward a conspicuously but abruptly cordate base. Flowers solitary; calyx less than 1 cm long; petals white; apex of the staminal tube 5-parted. Fruit irregularly 5-lobed, shorter than broad, the calyx caducous. Infrequent, in mature forest, the seedlings very abundant. Known only from Río Palenque.

Common name: "Molinillo"+

Quararibea soegenii (Cuatr.) A. Robyns & S. Nilsson

Plate 124-A

Mid-canopy tree, ca. 10 m tall. Leaves broadly ovate, to 32 × 32 cm, deeply cordate, palmately 9-to 11-nerved, stellate-pubescent below. Flower solitary, more or less cauliflorous; petals light blue-green, to 5 cm long; apex of the staminal column 5-lobed. Fruit ellipsoid, ca. 4 cm in diameter, the base enclosed by the expanded calyx. Rare, in mature forest. Previously known from Esmeraldas and Pichincha Provinces, Ecuador.

Common name: "Zapotillo"

BORAGINACEAE

Herbs, shrubs or trees; stems terete. Leaves alternate, simple, usually entire, without stipules. Inflorescences uncurl as the flowers open. Flowers regular, tubular; sepals 5; corolla 5-lobed; stamens 5, mounted on the corolla, equal; ovary superior. Fruit of 4 nutlets or a drupe.

Key to the species.

1. Herbs. *Heliotropium rufipilum*
1. Shrubs, trees or vines.
 2. Styles and stigma simple; plant often scandent . . . *Tournefortia glabra*
 2. Styles twice-divided, stigmas 4; shrubs or trees.
 3. Nodes enlarged, hollow, inhabited by ants; hairs stellate.
 *Cordia alliodora*
 3. Nodes neither swollen nor hollow, not inhabited by ants; hairs simple.
 4. Subshrub; leaves small (less than 9 × 3.5 cm), with 3-5 secondary nerves *Cordia bifurcata*
 4. Small to large trees; leaves large (more than 10 × 4.5 cm), with more than 6 secondary nerves.
 5. Inflorescences spicate, axillary *Cordia spinescens*
 5. Inflorescences corymbose, terminal
 6. Leaves beneath with scattered, short, appressed trichomes, each arising from a basal swelling.
 *Cordia cf. porcata*
 6. Leaves beneath densely pubescent, trichomes without basal swelling.
 7. Trichomes on the leaf undersurface strongly appressed; leaves scabrous. *Cordia sericicalyx*
 7. Trichomes on the leaf undersurface all or mostly erect; leaves soft-pubescent beneath.

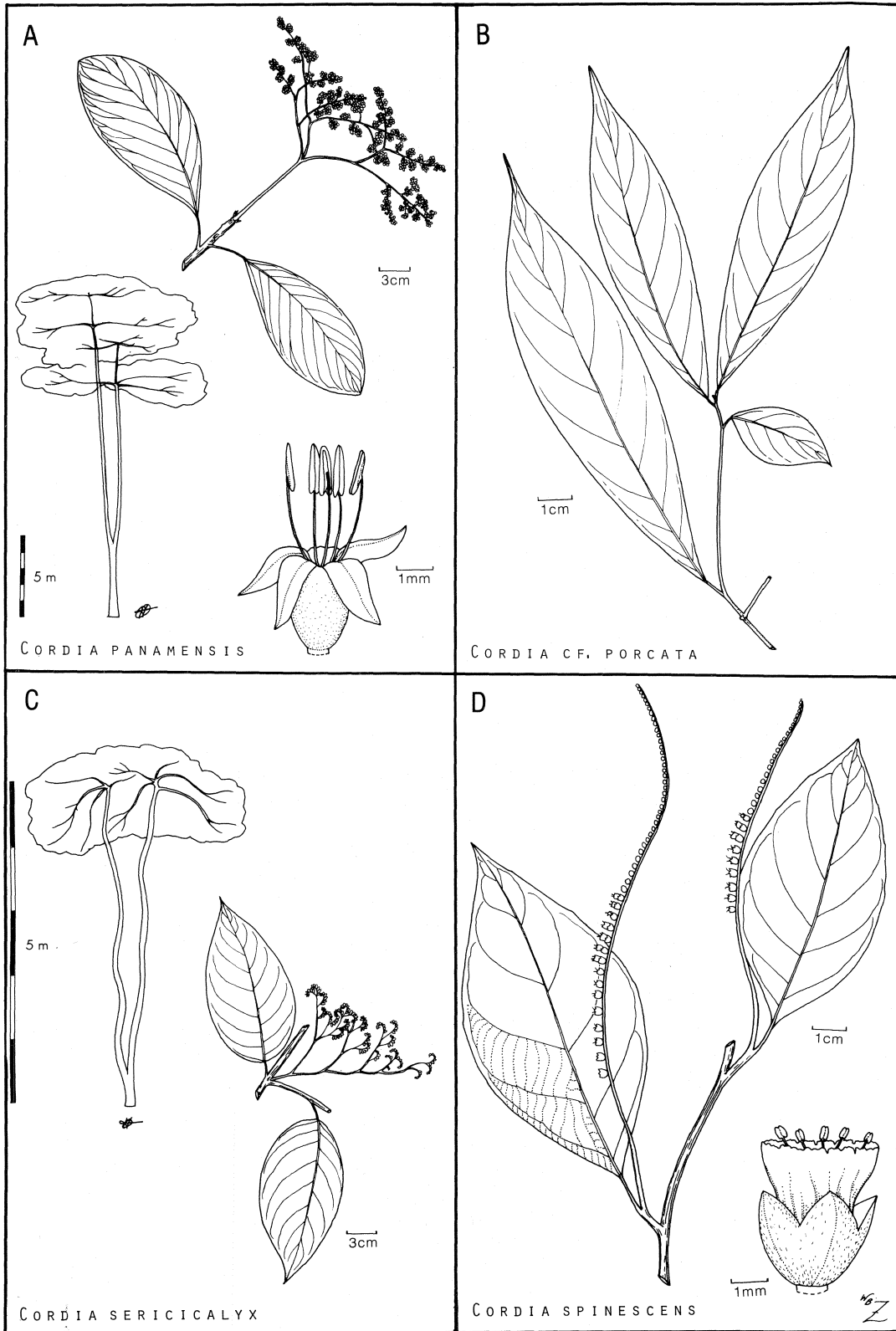


Plate 125

8. Young stems and petioles hirsute (with long, spreading trichomes) *Cordia dwyeri*
 8. Young stems and petioles puberulous (with short, sub-appressed trichomes)
 *Cordia panamensis*

***Cordia alliodora* (R. & P.) Cham.**

Plate 124-B

Medium-sized to large tree, the nodes swollen and hollow, inhabited by ants. Leaves stellate-pubescent beneath. Inflorescences large, cymose. Flowers white. Fruit cylindrical, not drupaceous, with persistent dried corolla lobes. Common, in disturbed areas. Widespread through most of tropical America. Common name: "Laurel"+

***Cordia bifurcata* Roemer & Schultes**

Plate 124-C

Shrub or subshrub about 1 m tall. Leaves small, less than 9 × 3 cm, somewhat scabrous. Inflorescence contracted. Flowers white. Fruit red, drupaceous. Uncommon, along the river bank. Costa Rica and Panama south to Bolivia.

***Cordia dwyeri* Nowicke**

Plate 124-D

Medium-sized tree 6-10 m tall, the branches in conspicuous whorls. Leaves large, hirsute beneath, especially along the veins. Fruits orange-red, drupaceous, round, to 1.5 cm in diameter. Infrequent, in mature forest. Ranges north through Colombia to Costa Rica.

***Cordia panamensis* Riley**

Plate 125-A

Cordia hebecladia Johnst.

Medium to large tree. Leaves fairly large, 12-20 × 7-11 cm, softly velutinous beneath, with relatively short trichomes. Inflorescence large, rather flat-topped. Flowers white. Rare, in mature forest. The Ecuadorian plant was reported under this name by Little but was later segregated as *C. hebecladia*. Johnston separated his species only by more regularly dichotomous branching and softer indumentum than in *C. panamensis*. However, the rather heterogenous material now referred to the latter in Panama includes specimens with the soft downy indumentum of *C. hebecladia* which is probably no more than a variant of *C. panamensis*. This species ranges from Mexico to Trinidad and, as *C. hebecladia*, south on the east side of the Andes to Bolivia and on the west side of the mountains to Ecuador.

***Cordia* cf. *porcata* Nowicke**

Plate 125-B

Treelet, 2 m tall, in mature forest. Petiole less than 1 cm long; leaves lanceolate-elliptic to very narrowly elliptic, acuminate, cuneate at the base, 8-22 × ca. 4.5 cm, appressed-pubescent with short, scabrous trichomes, the upper surface conspicuously subscabrous, the lower surface sparsely subscabrous. Inflorescence (in Panama) cymose, open, pubescent. Flowers white, subsessile; calyx cupular ca. 5 mm long; corolla tube 4 mm long, the 5 lobes ca. 5 mm long. Previously known only from Panama. Known only from sterile material at Río Palenque. Our plant differs from Panamanian specimens in the leaf being subscabrous above instead of below, but is closer to *C. porcata* than to any other species represented at MO.

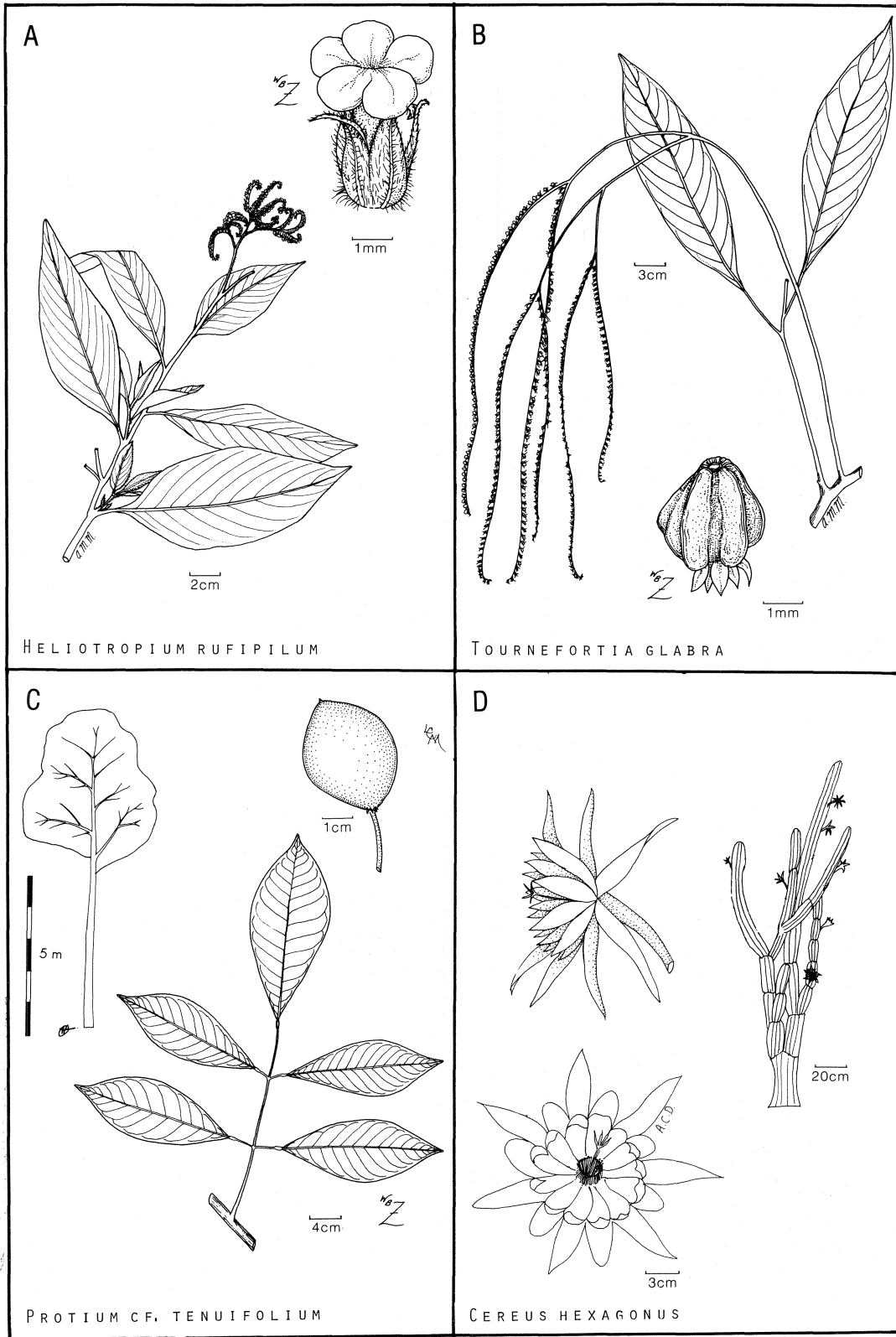


Plate 126

***Cordia sericalyx* DC.**

Plate 125-C

Small to medium-sized tree. Leaves 10-16 × 4.5-10 cm, ovate to elliptic, acuminate, rounded at the base, scabrous, the trichomes appressed. Inflorescences cymose, mostly axillary. Flowers white. Fruit black, drupaceous. Rare, in mature forest. Widespread in South America, north to Panama.

***Cordia spinescens* L.**

Plate 125-D

Shrub, sometimes rambling. Leaves puberulous beneath, to 12 × 6 cm. Inflorescence spicate, axillary, the base adnate for 1 cm to the petiole. Flowers only on one side of the inflorescence, minute, greenish white. Fruit globose, white, fleshy. Common, in disturbed areas. Mexico and parts of the West Indies south to Peru.

***Heliotropium rufipilum* (Benth.) Johnst.**

Plate 126-A

Herb, to 1 m tall. Leaves elliptic, acute, cuneate at the base, puberulous, to 13 × 5 cm. Inflorescence branched, the branches conspicuously one-sided (scorpioid). Flowers white. Uncommon, sporadic on the river beaches. Ecuador and Peru.

***Tournefortia glabra* L.**

Plate 126-B

Shrub or vine. Leaves elliptic, acuminate, cuneate at the base, essentially glabrous. Inflorescence cymose, with long drooping branches, the sessile flowers occurring only on one side. Flowers minute, greenish white. Fruit globose, white, fleshy. Common, in disturbed areas. Mexico and parts of the West Indies south to Peru.

Common name: "Maiz de Gallo"

BURSERACEAE

Shrubs to large trees with aromatic oils in the stems and leaves. Leaves alternate, pinnately compound, without stipules. Flowers bisexual or unisexual, regular, small; sepals 3 to 5, joined basally; petals 3-5, alternate with the sepals; disc present; stamens 6-10, distinct; style 1. Fruit a 1-to 5-seeded berry or a capsule.

***Protium* cf. *tenuifolium* Engl.**

Plate 126-C

Tree to 15 m tall; with a trunk 25 cm in diameter at the base. Leaves 5-foliate; leaflets elliptical, the margin entire, the apex acuminate, the base with a swollen geniculum, the apical leaflet 20 × 9 cm, the lateral leaflets 18 × 8 cm; petiole lightly pubescent. Fruits green, hollow, oblique, 3 × 2.5 cm, with 1 seed. The plant is strongly fragrant of creosote. Rare, in mature forest. Panama and northern South America. This is part of a taxonomically difficult complex and the specific identification is tentative.

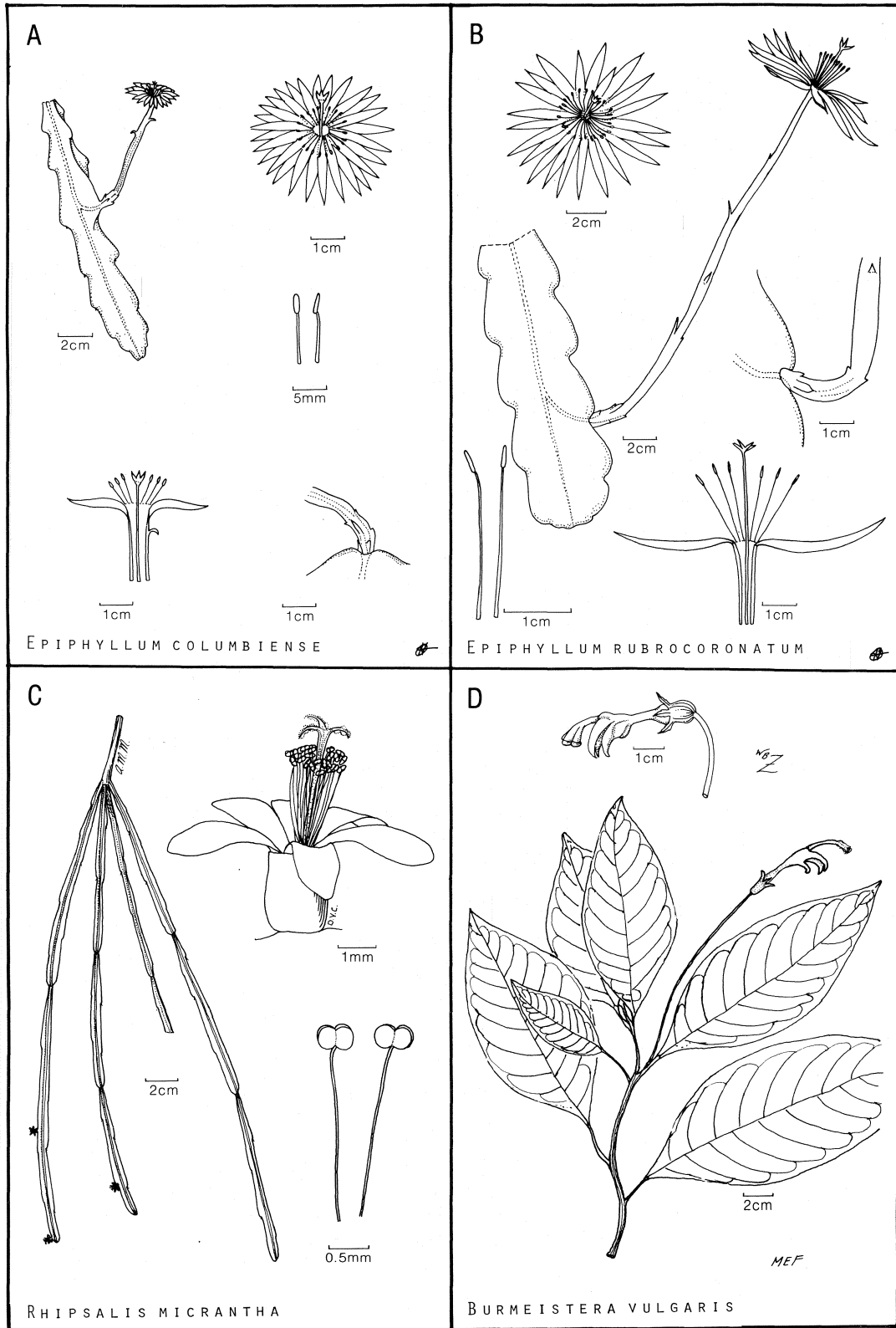


Plate 127

CACTACEAE

Succulent shrubs, trees or vines; often epiphytes, with fleshy, flattened or strongly ribbed stems. Leaves early deciduous. Flowers solitary, regular; sepals and petals undifferentiated, numerous; stamens numerous; ovary inferior. Fruit a berry.

Key to the species.

1. Trees, to 5 m tall; cultivated *Cereus hexagonus*
1. Vines or epiphytic shrubs; native.
 2. Flowers without a conspicuous floral tube; stems to 1 cm wide
 *Rhipsalis micrantha*
 2. Flowers with an obvious floral tube; stems 2 cm or more wide.
 3. Floral tube to 40 cm long, the petals to 4 cm long; internodal ridge longitudinally convex *Epiphyllum rubrocoronatum*
 3. Floral tube to 10 cm long, the petals to 1.5 cm long; internodal ridge longitudinally concave *Epiphyllum columbiense*

**Cereus hexagonus* (L.) Miller

Plate 126-D

Branched, tree-like plant, to 5 m tall. Stems deeply 4 to 5 ribbed, blue-grey, to 20 cm in diameter. Flower large, to 30 cm long, 20 cm in diameter, white. Commonly cultivated around homesites in the area. Illustration of flowers adapted from Britton & Rose, "The Cactaceae."

Epiphyllum columbiense (Weber) Dodson & A. Gentry

Plate 127-A

Epiphyllum phyllanthus var. *columbiense* (Weber) Back.

Pendent epiphyte, with the stems to 2 m long, triangular-alate toward the base, 2.5 cm wide toward the apex, flat, the margins undulate, the internodal ridges longitudinally concave. Floral tube white, to 10 cm long; petals white, to 1.5 cm long; stamens white. Infrequent, overhanging the river. Costa Rica to Ecuador. This species flowers frequently, has the odor of asters and always produces fruits autogamously. We recognize this species as distinct from the following species on the basis of the two being sympatric with no hybrids seen and also because of the adequate distinguishing features. (See Selbyana 2(1):31. 1977).

Epiphyllum rubrocoronatum (Kinnach) Dodson & A. Gentry

Plate 127-B

Epiphyllum phyllanthus var. *rubrocoronatum* Kinnach

Pendent epiphyte, with the stems to 3 m long, terete toward the base, to 8 cm wide toward the apex, flat, the margins undulate, the internodal ridges longitudinally convex. Floral tube white, to 40 cm long; petals white, to 4 cm long; stamens orange-red. Common, in trees along the river and in the mature forest. Panama, Colombia and western Ecuador. Flowers are produced rarely, and have the odor of clove-oil.

Rhipsalis micrantha (HBK) DC.

Plate 127-C

Pendent epiphyte, with the stems to 1.5 m long, terete at the base, flattened toward the apex, slightly undulate on the edge, sparsely branched. Flowers white, sessile, without an obvious floral tube; petals white, to 8 mm long. Common, in mature forest and in trees along the river. Widespread in tropical America.

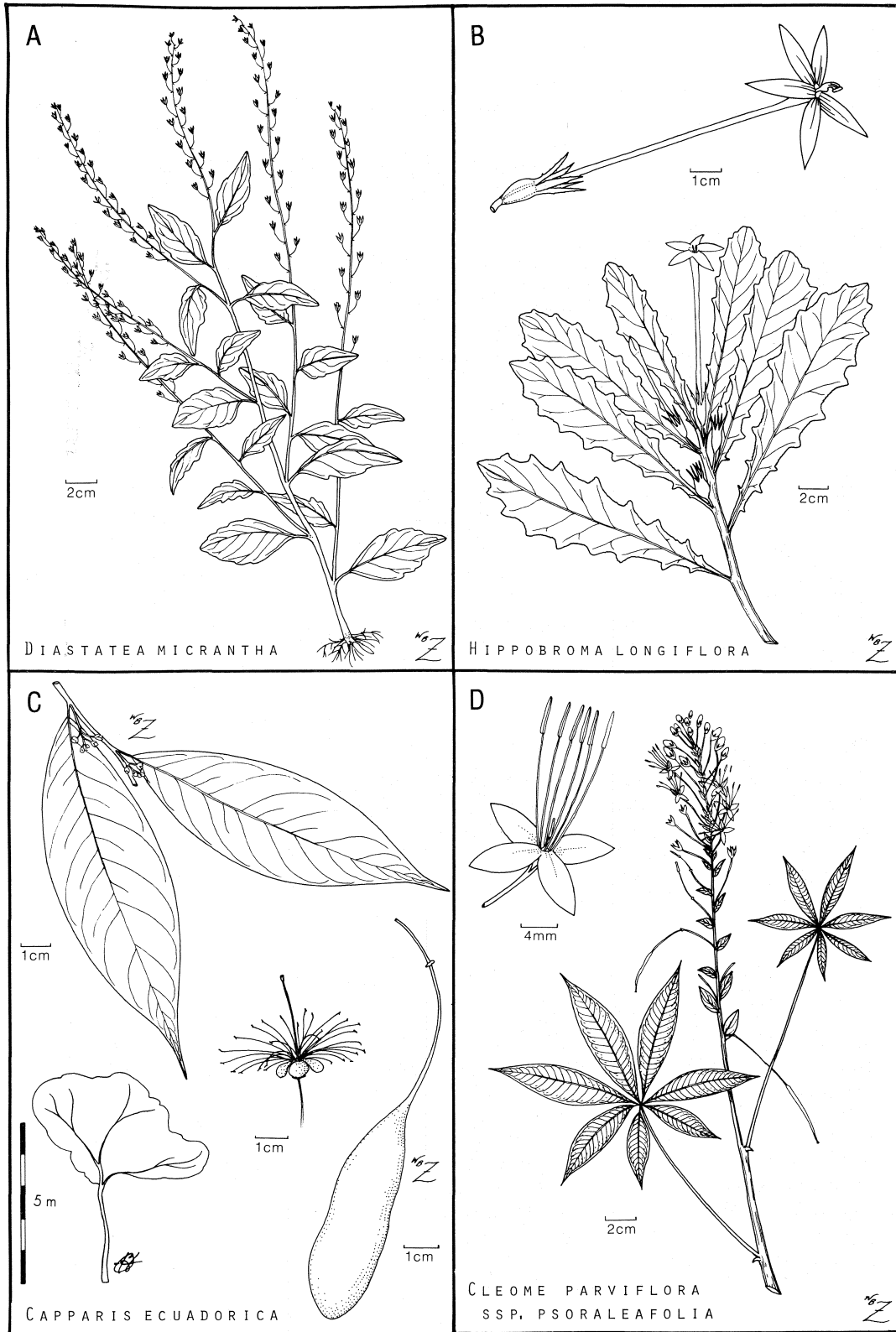


Plate 128

CAMPANULACEAE

Herbs. Leaves alternate, simple, without stipules. Flowers tubular, zygomorphic, bilabiate; calyx lobes, corolla lobes, and stamens 5; anthers joined around the style; ovary inferior. Fruit a capsule or a berry.

Key to the species.

1. Flowers white, the floral tube 10-15 cm long . . . *Hippobroma longiflora*
1. Flowers green or bluish, the floral tube less than 5 cm long.
 2. Flowers green, ca. 3 cm long; fruit a berry *Burmeistera vulgaris*
 2. Flowers bluish, 3-4 mm long; fruit a capsule *Diastatea micrantha*

***Burmeistera vulgaris* Wimmer**

Plate 127-D

Herb, to 1 m tall. Leaves ovate, acute, cuneate, finely serrulate, 8-11 × 4-5 cm. Flowers usually borne singly in the leaf axils; calyx lobes sublinear, ca. 5 mm long; corolla green, narrowed near the middle, broadened at the base and the apex, strongly bilabiate, 3 cm long. Fruit a berry, more than 2 cm in diameter. Infrequent and local, along Trail 2 in mature forest. Costa Rica to Ecuador.

***Diastatea micrantha* (HBK) McVaugh**

Plate 128-A

Annual herb, to 70 cm tall. Leaves ovate, obtuse, sessile to long-petiolate, irregularly serrate or jagged-toothed, 2.5-5 cm long. Inflorescence a terminal raceme, usually many-flowered, calyx deeply 5-lobed, the linear lobes 2-3 mm long; corolla blue to lilac, 3-4 mm long. Capsule narrowly ellipsoid, 4-6 mm long. Common along the river. Central Mexico to Peru and Bolivia.

***Hippobroma longiflora* (L.) G. Don**

Plate 128-B

Isotoma longiflora (L.) Presl

Low herb, to 40 cm tall. Leaves narrowly obovate, coarsely dentate with 15-20 large teeth, or finely serrate, mostly 10-20 cm long, attenuate to the base. Flowers borne singly in the leaf axils; corolla white, 10-15 cm long, 5-lobed, the narrow lobes 1.5-2 cm long. Fruit capsular, 1-2 cm long, pendent, with the rim surrounded by the persistent, 1 cm long, linear calyx lobes. Rare, in disturbed areas near homesites. Probably native to the West Indies; now common from Mexico to Brazil and Peru and sparingly introduced into paleotropics.

Common name: "Jazmincillo"

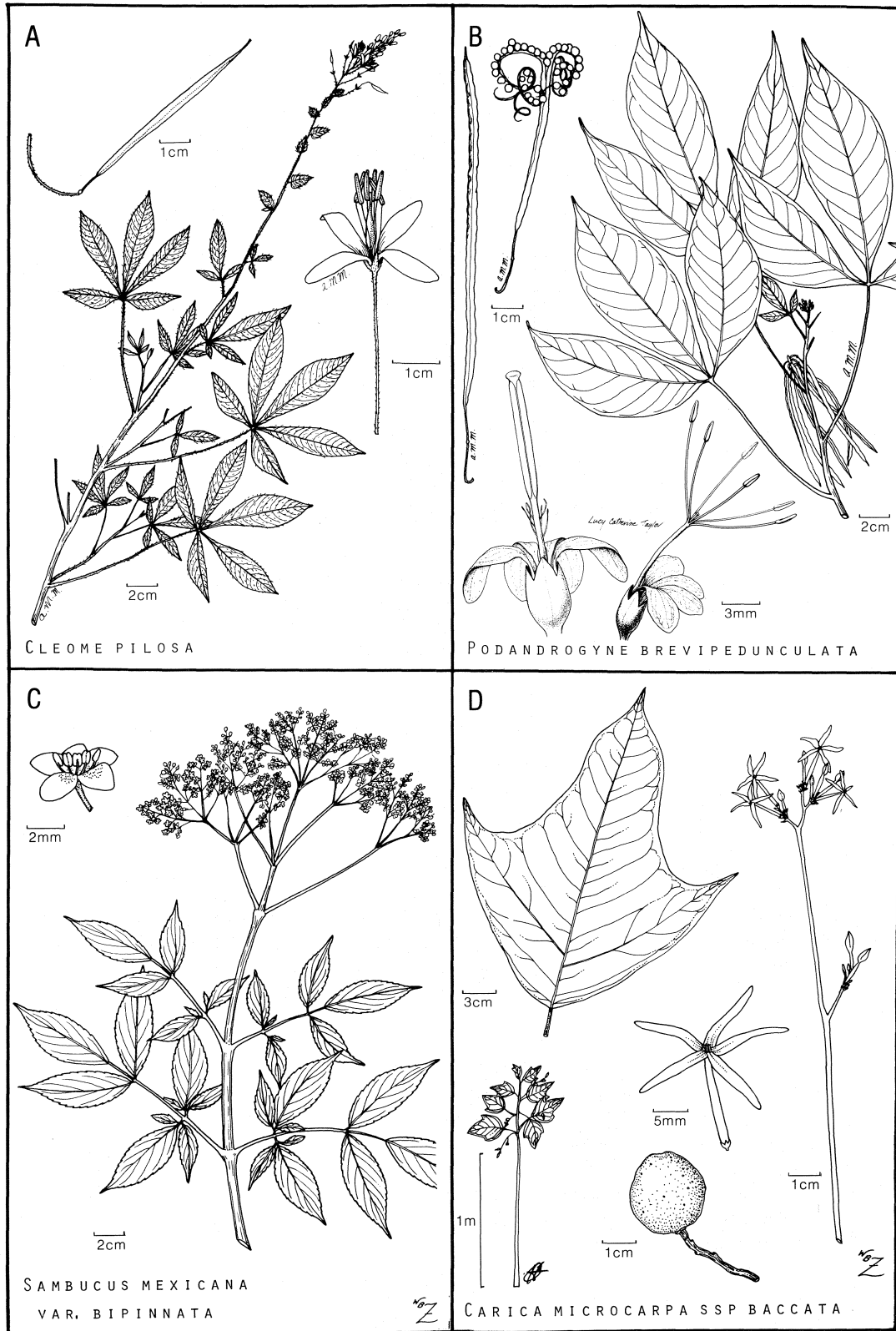


Plate 129

CAPPARIDACEAE

Herbs, shrubs or trees. Leaves alternate, simple, or palmately compound, the stipules minute or absent. Flowers regular or zygomorphic, white, pink or red; sepals 4; petals 4; stamens 6 to many; ovary superior on a short to elongate stipe (gynophore), 2-carpellate with parietal placentation. Fruit a capsule, the 2 valves dehiscent from the placentae (replum) or fleshy and with delayed dehiscence.

Key to the species.

1. Small trees; fruits \pm indehiscent with 1-7 seeds; leaves simple; stamens ca. 34-50. *Capparis ecuadorica*
1. Herbs or small succulent shrubs; fruits dehiscent with many small seeds; leaves palmately compound; stamens 6.
 2. Flowers white to light pink; fruits dehiscent by 2 fully deciduous valves, the filiform placentae not contorting; seeds not persistent, without a prominent aril.
 3. Stems pilose, never spiny; flowers light pink or white, the petals 8-15 mm long; fruit cylindrical, smooth, very gradually pointed from below the middle, deflexed from the gynophore by nearly a right angle; seeds with a minute white funicular aril.
 *Cleome pilosa*
 3. Stems and petioles often armed with "stipular" spines and with prickles on the petioles, glabrous to pilose; flowers white, the petals 6-8 mm long; fruit cylindrical, abruptly pointed at the apex, \pm continuous with gynophore; seeds without aril.
 *Cleome parviflora* ssp. *psoraleaefolia*
 2. Flowers orange; fruit tardily dehiscent, the fleshy placentae contorting at maturity; seeds persistent on placentae, with a prominent white funicular aril *Podandroyne brevipedunculata*

***Capparis ecuadorica* Iltis**

Plate 128-C

Shrub or small tree, to 8 m tall, glabrous. Leaves simple, 6-17 \times 3-6 cm, elliptic to elliptic-oblongate, long-acuminate, cuneate to rounded or subcordate at the base, glabrous. Inflorescences consisting of racemes, only 1-3(-5) cm long, either few-flowered and axillary, or 2- to 3-compound, and terminal. Petals white to greenish-white, 1 cm long. Fruit pendent, oblong, 1-5 cm long, on a 1-3 cm long stipe, indehiscent, dark purple-brown, with 1-7 seeds. Infrequent, in mature forest. Endemic to Pacific Ecuador.

***Cleome parviflora* HBK ssp. *psoraleaefolia* (DC.) Iltis**

Plate 128-D

Herb to 1.5 m tall, armed with pairs of "stipular" spines on the stems, the spines sometimes lacking, sparsely pilose to glabrous. Petiole to 14 cm long, often spiny; leaves palmately 5- to 7-foliolate, the leaflets elliptic, tapering at both ends, to 10 cm long. Petals white, 6-8 mm long. Fruits cylindrical, pointed at the apex, the stigma capitate, the stipe not sharply curved, (15-) 18-30 mm long. Infrequent, in disturbed areas. Mexico to Paraguay and Bolivia. This subspecies is only found in tropical South America.

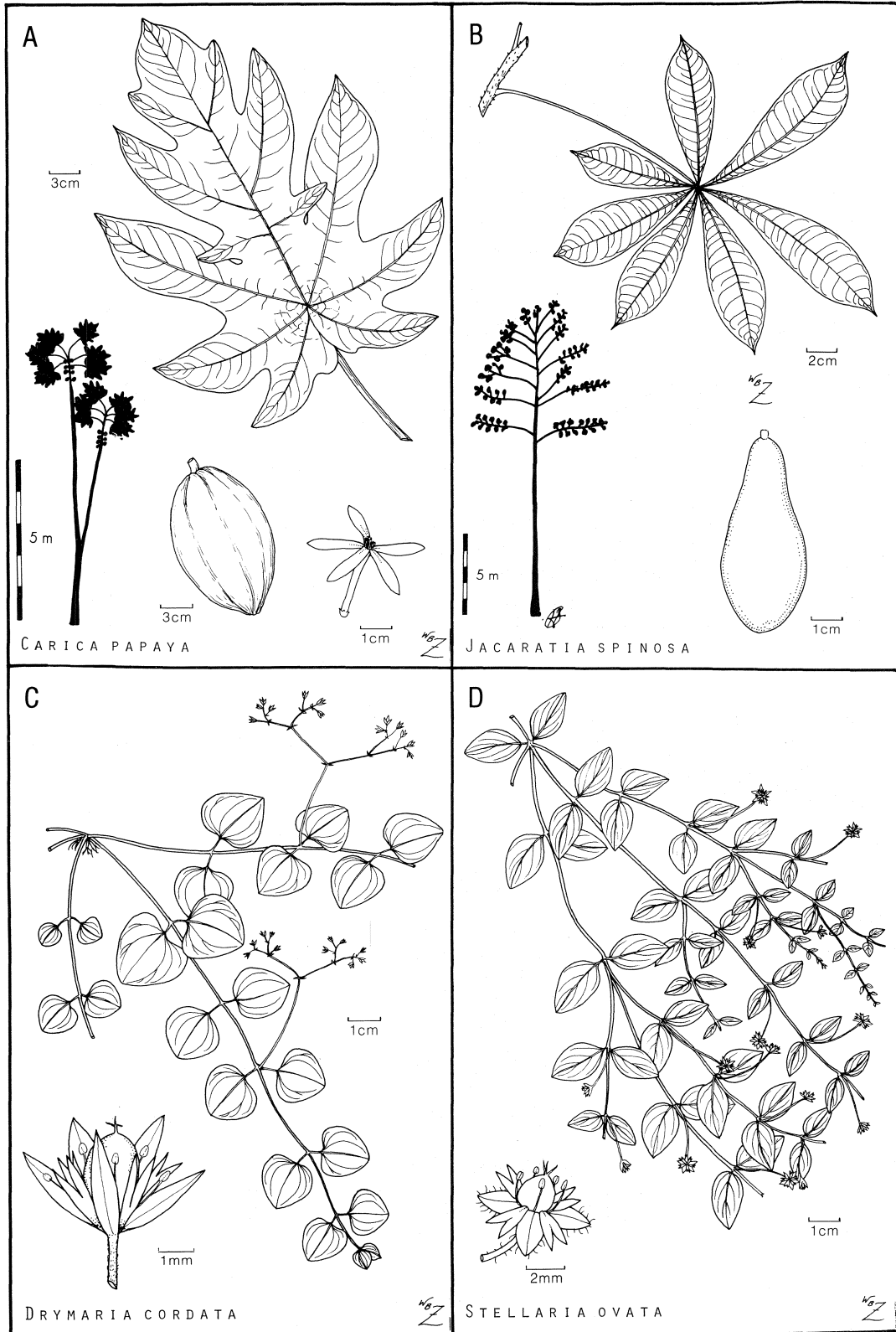


Plate 130

Cleome pilosa Benth.

Plate 129-A

Herb, to 1 m tall; stem and petioles pilose, without spines. Leaves palmately 5- to 7-foliolate, the petiole to 10 cm long, viscid-pubescent; the leaflets oblanceolate, tapering to both ends, to 9 cm long. Inflorescence a bracteate, terminal raceme. Petals light pink, ca. 7 mm long. Fruit long-tapering from below the middle, on a short, sharply-curved stipe. Seed with a minute, funicular aril. Uncommon, on gravel banks in the riverbed. Southern Mexico to Venezuela and Ecuador.

Podandrogynne brevipedunculata Cochrane

Plate 129-B

Herb, to 1.5 m tall. Leaves palmately 3-to 5-foliolate, glabrous, the leaflets narrowly elliptic, acuminate, cuneate, to 26 cm long, glabrous. Inflorescence a terminal corymbiform raceme (markedly foreshortened and flat-topped). Petals orange, 1-1.5 cm long. Fruits pendent, linear-cylindric, 8-18 cm long, 3-5 mm thick, the placentae becoming irregularly contorted at dehiscence. Common, in mature forest. Endemic to Pacific Ecuador.

CAPRIFOLIACEAE

Shrubs or small herbaceous trees with opposite, simple, or pinnately compound leaves. Flowers white, regular or zygomorphic; calyx 5-lobed; corolla tubular, 5-lobed; stamens alternate with corolla lobes; ovary inferior. Fruit a berry or a drupe.

Sambucus mexicana Presl var. **bipinnata** (S. & C.) Schwerin

Plate 129-C

Small tree, to 3 m tall. Leaves pinnately compound. Inflorescence terminal, compact, flat-topped. Flowers white. Rare, along the esteros in second growth. Widespread in tropical America.

Common name: "Sauco"

CARICACEAE

Fleshy trees or shrubs. Leaves alternate, palmately lobed or palmately compound. Male inflorescence elongate; flowers tubular; stamens 5. Female inflorescences sessile; flowers fleshy; petals 5, united at the base; stigmas 5. Perfect flowers on short inflorescences. Fruit fleshy.

Key to the species.

1. Leaves compound; large trees to 20 m tall, the stems armed with spines. *Jacaratia spinosa*
1. Leaves simple; herbaceous shrubs to small trees to 8 m tall, the stems unarmed.
 2. Fruits red when ripe, less than 5 cm long, not ridged *Carica microcarpa* ssp *baccata*
 2. Fruits yellow when ripe, more than 10 cm long, ridged longitudinally *Carica papaya*

Carica microcarpa Jacq. subsp. **baccata** (Heilb.) Badillo Plate 129-D

Succulent shrub, to 3 m tall. Leaves simple, deeply lobed, to 30 cm long. Male plants with elongate, branched peduncles to 30 cm long. Flowers 2 cm long, green. Female flowers sessile in the axils of the leaves, 3 cm long. Fruits to 4.5 cm long, red. Infrequent, in mature and disturbed forest. Venezuela to Amazonian Peru.

Carica papaya L. Plate 130-A

Fleshy, erect trees, to 8 m tall, rarely branched. Leaves simple, palmately lobed, to 1 m long. Male flowers to 4 cm long, green; female flowers sessile, 8 cm long; perfect flowers intermediate. Fruits to 15 cm long, ridged longitudinally, yellow when ripe. Cultivated forms with much larger fruits are prized in the region. Common, in disturbed areas. Pantropical.

Common name: "Papaya de Mico"+

Jacaratia spinosa (Aubl.) A. DC. Plate 130-B

Somewhat fleshy, branched trees, to 20 m tall. Stems armed with spines. Leaves palmately compound; blade to 15 cm long; petiole to 15 cm long. Peduncles to 10 cm long. Flowers green. Fruits narrowly elliptical, to 15 cm long, 4 cm in diameter, orange. Infrequent, in mature forest. Costa Rica to Brazil.

Common name: "Papaya de Venado"+, "Tambora", "Papayuela"

CARYOPHYLLACEAE

Herbs with swollen nodes. Leaves opposite, simple, the petiole bases connate. Flowers white, regular; sepals 5; corolla with 5 lobes; petals free; stamens 5 to 10; ovary superior; styles and stigmas 2-5. Fruit a capsule.

Key to the species.

1. Inflorescence unbranched *Stellaria ovata*
 1. Inflorescence branched *Drymaria cordata*

Drymaria cordata (L.) Willd. Plate 130-C

Subprostrate herbs with slender stems. Leaves opposite, orbicular. Inflorescence to 10 cm long. Flowers in compact cymes. Pedicels swollen, tomentose. Petals white, 3-4 mm long. Common weed, in clearings and along trails in mature forest. Mexico and the West Indies to Argentina.

Common name: "Nervillo"

Stellaria ovata Willd. ex Schlecht. Plate 130-D

Subprostrate herbs, to 20 cm tall, forming mats. Leaves opposite, broadly elliptic. Flowers solitary in axils of the leaves, the pedicels to 2 cm long; sepals to 5 mm long; petals white, to 5 mm long. Common, on rocky beaches. Mexico to Amazonian Peru.

CELASTRACEAE

Trees, shrubs, or lianas. Leaves alternate or opposite, simple, often serrate, the stipules small and caducous. Inflorescence usually dichotomously branched, usually paniculate or racemose. Flowers bisexual or unisexual; calyx 4-to 5-lobed; petals 4-5; stamens 4-5, inserted at the margin of a conspicuous central disc; ovary 2-to 5-locular, style short or absent. Fruit a capsule, drupe or samara; the seeds usually arillate.

***Perrottetia sessiliflora* Lundell**

Plate 131-A

Small to large tree, to 30 m tall; when tall, the trunk irregularly fenestrated, the base buttressed, the inner bark red, the sap wood reddish. Leaves alternate, oblong, acuminate, obtuse at the base, entire or subserrulate, to 24 × 7 cm. Inflorescence axillary, paniculate, several-branched, to ca. 7 cm long. Flowers tiny, greenish, sessile. Rare, in Dodson forest. Costa Rica to Pacific Ecuador.

CHRYSOBALANACEAE (Rosaceae)

Trees or shrubs. Leaves simple, entire, alternate, stipulate. Inflorescence racemose, paniculate or cymose. Flowers usually bisexual, regular or zygomorphic; sepals 5; petals usually 5, sometimes absent; stamens 2-300; ovary 3-carpeled, (but usually aborted to 1), pubescent. Fruit a dry or fleshy drupe.

***Hirtella mutisii* Killip & Cuatr.**

Plate 131-B

Canopy tree, 25-30 m tall. Leaves obovate-elliptic, acute to acuminate, cuneate, almost sessile, to 11.5 × 4 cm, the petiole 1-2 mm long. Inflorescence racemose, few-flowered. Flowers 5-parted; sepals ca. 3 mm long; petals white, caducous; stamens and style pink, the 3 stamens alternating with staminodes, the filaments much longer than the perianth. Rare, in mature forest. Endemic to coastal Ecuador and adjacent Colombia.

Common name: "Coquito"+

COMBRETACEAE

Trees, shrubs, or lianas. Leaves alternate or opposite, simple, without stipules. Flowers white, regular; calyx lobes 4-5; corolla lobes 4-5 or absent; stamens 2-10; ovary 1-loculed, inferior, the fruit strongly ribbed or winged.

****Terminalia catappa* L.**

Plate 131-C

Medium-size tree, to 20 m tall, with branches in whorls. Leaves broadly obovate, thin, to 40 × 15 cm. Flowers minute, greenish-white, in long spikes. Fruits obovoid, flattened, to 7 cm long, green, somewhat fleshy. The seeds are occasionally eaten. Cultivated around homesites.

Common name: "Almendra"+

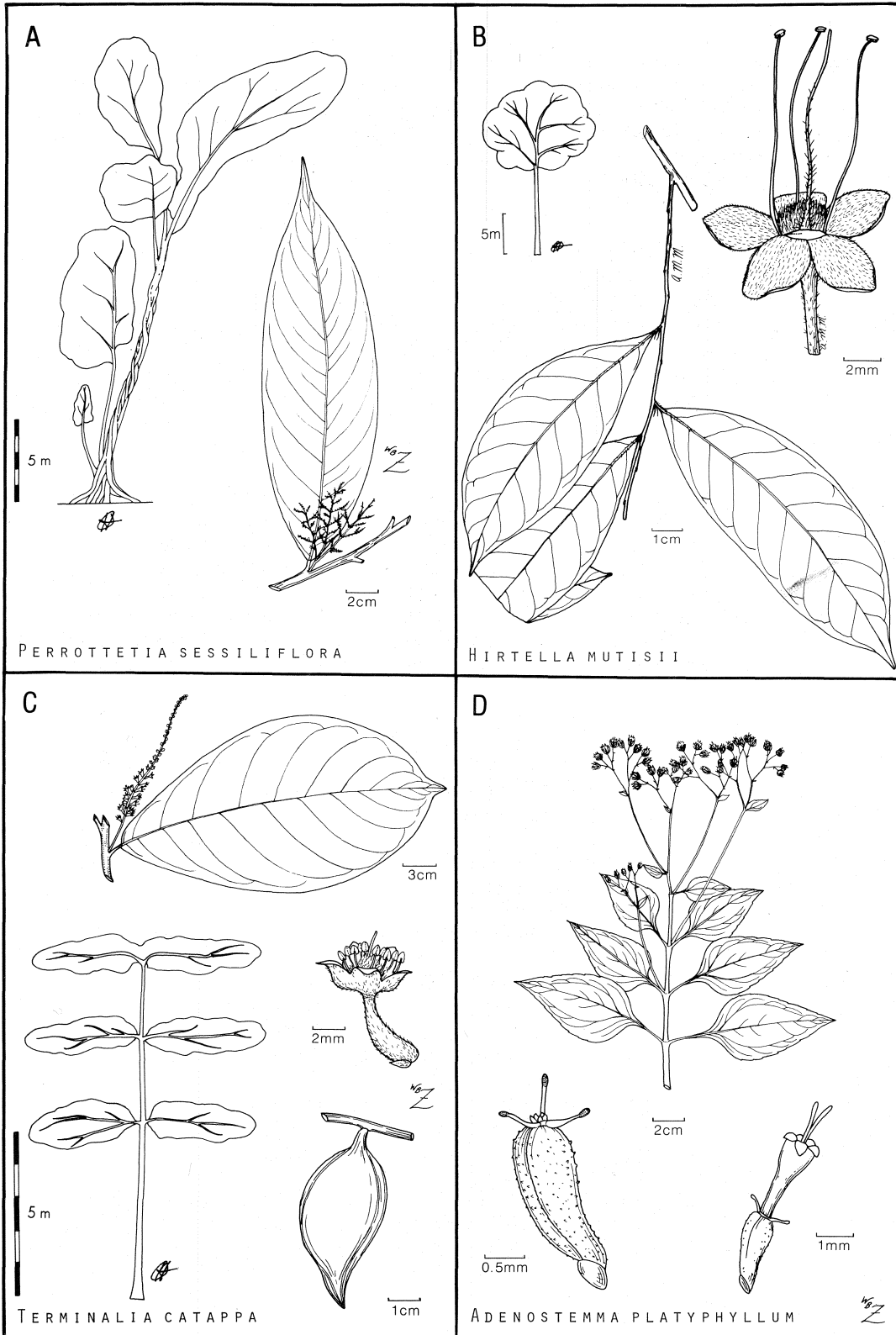


Plate 131

COMPOSITAE

Herbs, shrubs, vines or trees. Leaves alternate, opposite, or whorled, simple or compound. Inflorescence a compound head with a receptacle which usually has obvious bracts, frequently with short disc flowers and petal-like ray flowers; stamens 5, mounted at the apex of the corolla tube; anthers forming a cylinder around the style; ovary inferior, unilocular with one ovule. Fruit an achene, usually with a pappus.

Key to the species.

1. Leaves compound, 3-to 5-foliolate or bipinnate.
 2. Vine; flowers orange-red *Hidalgia ternata*
 2. Erect herbs; flowers yellowish.
 - 2a. Leaflets narrowly elliptic; flower heads 4-6 cm in diameter; cultivated. *Tagetes erecta*
 - 2a. Leaflets ovate; flower heads to 2 cm in diameter; tropical weeds.
 3. Leaves 5-foliolate *Bidens pilosa*
 3. Leaves bipinnate *Bidens bipinnata*
1. Leaves simple.
 4. Leaves alternate.
 5. Leaves linear, less than 8 mm wide, entire; plants silvery-gray throughout, densely softly sericeous with long whitish trichomes *Gnaphalium cf. cheiranthifolium*
 5. Leaves elliptic to narrowly ovate or linear-oblong, mostly more than 1 cm wide, entire or variously serrate; plants not densely sericeous (silvery gray but with scattered trichomes in *Tessaria*).
 6. Leaves irregularly-lobed or jaggedly-serrate (Dandelion-like), narrowly ovate to obovate, (if not conspicuously lobed, at least the uppermost with tooth-edged basal lobes).
 7. Herb to 3 m tall; heads less than 0.5 cm long; flowers white; achene with 2 awns. *Verbesina gigantea*
 7. Herbs to 1 m tall; heads more than 1 cm long; flowers yellowish or reddish; achene with a long pappus.
 8. Flowers greenish-yellow; leaves all sessile *Erechtites hieracifolia*
 8. Flowers reddish or pinkish; lower leaves narrowed to a long, irregularly winged petiole.
 9. Flowers red; inflorescence open, few-headed; leaves irregularly serrate, mostly obovate *Emilia fosbergii*
 9. Flowers pinkish; inflorescence relatively congested, several-headed; leaves deeply incised, narrowly ovate *Erechtites valerianaefolia*
 6. Leaves entire or finely and evenly serrate, ovate or elliptic to narrowly obovate or linear-oblong.
 10. Shrub or small tree to 3 m tall; inflorescence a many-flowered, flat-topped panicle; leaves linear-oblong (to very narrowly elliptic), conspicuously greyish with long appressed trichomes *Tessaria integrifolia*
 10. Herb to 1 m tall or a vine; inflorescence not flat-topped, usually rather few-headed, variously congested; leaves ovate to narrowly obovate or linear-oblong, not greyish.

11. Erect herbs or shrubs; inflorescence with leafy bracts; leaves serrate (at least slightly), narrowly obovate, ovate, or almost linear.
 12. Leaves almost linear to narrowly obovate, the lowermost ca. 1 cm wide; inflorescence an open, rather narrow panicle *Conyza apurensis*
 12. Leaves ovate or narrowly obovate, the lowermost well over 1 cm wide; inflorescence various, contracted.
 13. Leaves ovate, conspicuously serrate; inflorescence a few-headed, umbellate-paniculate cluster *Garcilassa rivularis*
 13. Leaves narrowly obovate; inflorescence elongate and spicate, or the heads compound and about 1.5 cm across.
 14. Inflorescence of several compound heads, each 1.5 cm across, subtended by a whorl of 3 leafy bracts . . . *Elephantopus mollis*
 14. Inflorescence elongate and spicate; heads not compound, 4-5 mm across and each subtended by a single bract
. *Pseudelephantopus spiralis*
11. Vines; inflorescence without leafy bracts; leaves elliptic, entire.
 15. Leaves 3-veined from near the base, sparsely pubescent with scattered simple trichomes
. *Baccharis trinervis*
 15. Leaves pinnately veined, tan and densely stellate-tomentose below *Piptocarpha poeppigiana*
4. Leaves opposite.
 16. Heads of the inflorescence sessile in the leaf axils, pedicels and peduncles absent *Synedrella nodiflora*
 16. Heads of the inflorescence pedicellate.
 17. Heads borne singly or in fascicles of 2 or 3, commonly more than 1 cm across, the peduncle unbranched or bearing two flowers; achenes without a pappus (sometimes with a few bristles in *Melanthera aspera*).
 18. Flowers axillary (and terminal) at many leaf axils, usually in fascicles of 2-4 flowers per node.
 19. Flowers white; heads 5-9 mm wide *Eclipta alba*
 19. Flowers yellow; heads 3-4 mm wide . . . *Jaegeria hirta*
 18. Flowers terminal or in a few upper leaf axils, never more than 2 peduncles per node.
 20. Leaves narrowly ovate or narrowly obovate, in part three-lobed *Wedelia trilobata*
 20. Leaves elliptic or ovate, not lobed.
 21. Vine; leaves elliptic; heads 1.5 cm across; fruits black, berry-like *Wulffia baccata*
 21. Herbs; leaves ovate; heads ca. 1 cm across; fruits dry.

- 22. Flowers white; leaves more than 6 cm long . . .
 *Melanthera aspera*
- 22. Flowers yellow; leaves less than 6 cm long.
 - 23. Achene margins thickened; leaves mostly obtuse, 2 to 5 cm wide
 *Spilanthes paniculata*
 - 23. Achene margins thin; leaves acute, less than 2.5 cm wide. *Spilanthes alba*
- 17. Heads borne in many-flowered panicles, each less than 1 cm across; achenes usually with a pappus.
 - 24. Flowers yellow; pappus of soft silky bristles
 *Schistocarpha eupatorioides*
 - 24. Flowers white, greenish, or lavender; pappus of awns, stiff hairs, or lacking.
 - 25. Tree several meters tall; leaves pinnately veined
 *Vernonia baccharoides*
 - 25. Vines or herbs to 2 m tall; leaves 3-veined from near the base (except *Mikania guaco*).
 - 26. Vines; inflorescence axillary and terminal.
 - 27. Leaves mottled purple and pale green beneath when young, not 3-veined *Mikania guaco*
 - 27. Leaves green, not mottled, 3-veined from at or near the base.
 - 28. Inflorescence branches elongate-racemose; leaves entire. *Mikania leiostachya*
 - 28. Inflorescence branches corymbose; leaves usually serrate or serrulate.
 - 29. Leaves somewhat triangular in outline, barely or not at all serrulate; each head with 4 florets.
 - 30. Leaves cordate at the base.
 *Mikania cordifolia*
 - 30. Leaves truncate at the base
 *Mikania hookeriana*
 - 29. Leaves evenly rounded, distinctly serrate or serrulate; each head with more than 4 florets.
 - 31. Petiole less than 1 cm long; leaf base cuneate
 *Austroeupatorium inulaefolium*
 - 31. Petiole more than 1 cm long; leaf base rounded to truncate.
 *Critonia billbergiana*
 - 26. Erect herbs; inflorescence terminal.
 - 32. Delicate erect herbs; heads of the inflorescence widely separated; pappus of 3 (-5) stalked knobs.
 - 33. Pappus glands in discrete clusters on the tips of knobs, the achene ca. 5 mm long; heads with less than 10 florets.
 *Sciadocephala schultze-rhonhofiae*

33. Pappus glands in elongate clusters on the tips and outer surfaces of knobs, the achene ca. 2 mm long; heads with more than 10 florets.
 *Adenostemma platyphyllum*
32. Suffrutescent herbs; heads of the inflorescence close together; pappus capillary, of many long trichomes or lacking.
34. Pappus lacking; leaves obtuse or achenes fleshy.
35. Leaves obtuse, 3-veined from the base, less than 4 cm long; flowers white; achenes dry *Ageratum conyzoides*
35. Leaves acuminate, 3-veined from well above the base, more than 5 cm long; flowers greenish; achenes fleshy.
36. Petiole to 7 cm long, leaves to 10 cm wide, barely serrulate; receptacles with bracts.
 *Clibadium remotiflorum*
36. Petiole to 15 cm long, larger leaves more than 10 cm wide, distinctly obtusely serrate; receptacles naked
 *Clibadium grandifolium*
34. Pappus of conspicuous capillary hairs; leaves acute to acuminate; achenes dry.
37. Flowers lavender; leaves less than 4 cm wide. . . *Fleischmannia obscurifolia*
37. Flowers white; leaves more than 4 cm wide.
38. Heads with ca. 50 florets; leaf base broadly and shallowly cordate. . . .
 *Hebeclinium macrophyllum*
38. Heads with 8-12 florets; leaf base rounded to truncate
 *Critonia morifolia*

***Adenostemma platyphyllum* Cass. (Eupatorieae)**

Plate 131-D

Glabrate herb. Leaves opposite, rhombic-ovate, acute at the apex, the base attenuate, irregularly 3-veined from near the base, distantly serrulate, to 9 × 5 cm; petiole to 2 cm long. Inflorescence paniculate; involucre bracts 1-seriate, 3-4 mm long, obtuse; disc flowers white; ray flowers lacking. Common, along paths and roadsides. Panama to Argentina.

Common name: "Mama Juana"+

Ageratum conyzoides L. (Eupatorieae)

Plate 132-A

Erect herb, to 60 cm tall, the young branches hirsute. Leaves opposite, ovate, obtuse, the base truncate, irregularly 3-veined from the base, regularly serrate, to 4 × 3 cm; petiole to 1 cm long. Inflorescence relatively few-headed (7-20), the heads corymbosely arranged; involucre bracts in several series, 3-4 mm long, acuminate, with toothed margins; disc flowers white; ray flowers absent. Infrequent, on river beaches. Native to Central and South America, now pantropical.

Common name: "Santa Lucia"

Austroeupatorium inulaefolium (HBK) King & Robinson (Eupatorieae)

Plate 132-B

Eupatorium inulaefolium HBK

Shrub or vine (at Río Palenque). Leaves opposite, serrate, ovate, acuminate, acute at the base, 3-veined from well above the base, petiolate, to 15 × 5 cm. Inflorescence a terminal corymbose panicle, the involucre bracts 12-15, in ca. 3 series, the heads with 8-15 florets; flowers white; ray flowers absent. Achenes pappose. Uncommon, at forest edge. Widespread in South America, north to Panama; adventive in tropical Asia.

Baccharis trinervis Pers. (Astereae)

Plate 132-C

Vine or scandent shrub. Petiole hardly differentiated. Leaves alternate, narrowly elliptic, acute at the base and the apex, more or less entire, conspicuously 3-veined from near the base, to 7 × 2 cm. Inflorescence a terminal panicle composed of a series of axillary racemes or reduced panicles, from the axils of increasingly reduced terminal leaves. Involucre bracts in several series, obtuse, the margins erose, the largest (inner) to 3 mm long, the flowers white; ray flowers absent. Uncommon, in disturbed areas. Mexico to Argentina.

Common name: "Alcotan"

Bidens bipinnata L. var. *cynapiifolia* (HBK) Maza (Heliantheae) Plate 132-D

Erect herb, to 1 m tall. Similar to next species but the leaves bipinnately compound and achenes curved. Not yet collected at Río Palenque but growing as a roadside weed just across the river. Through most of tropical America, adventive in Hawaii and Old World tropics; the typical variety is native to the southeastern United States.

Bidens pilosa L. (Heliantheae)

Plate 133-A

Erect herb, to 1 m tall, stems angled, glabrous. Leaves pinnately compound, (3-) 5-foliolate, the leaflets to 5 × 1.5 cm, acute, obtuse at the base, serrate. Inflorescence of a few terminal heads, each head to 1.5 cm long in fruit; flowers yellow; ray flowers absent. Achenes ca. 15 mm long, linear, the pappus reduced to 3 stiff bristles. Infrequent, in disturbed areas. Apparently native to the Caribbean region but now an almost cosmopolitan weed.

Common name: "Moriseco"

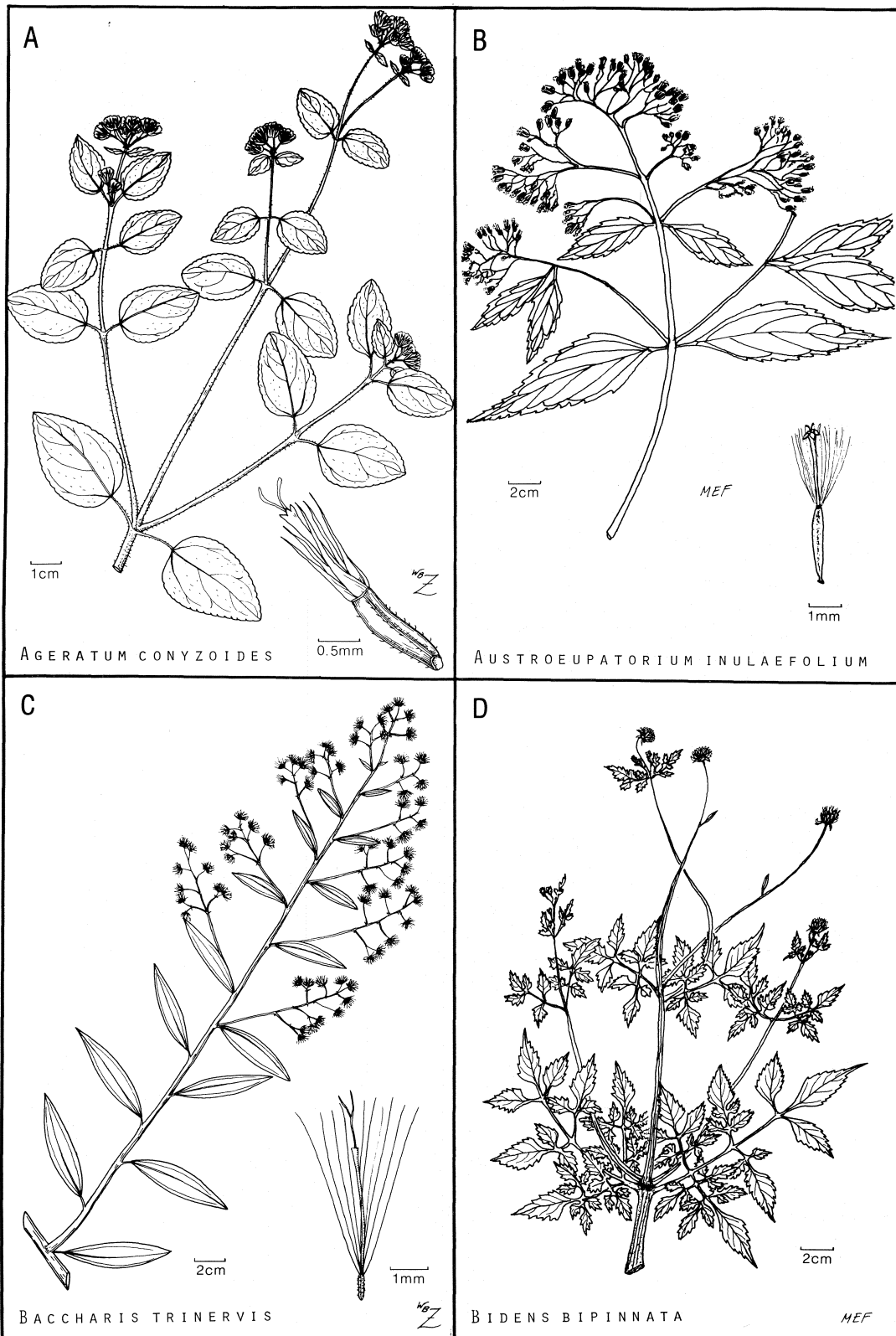


Plate 132

Clibadium grandifolium Blake (Heliantheae)

Plate 133-B

Shrubby herb. Petiole to 15 cm long; leaves opposite, to 20 × 13 cm, obtusely serrate, usually more or less pinnately-veined (the second or third pair of lateral veins conspicuous and strongly ascending), acute, obtuse at the base with an abrupt attenuation at the extreme top of the petiole, scabrous. Rare, on gravel bars in the riverbed. Known only from the sterile material described above and identification is tentative. Costa Rica to Pacific Ecuador. Inflorescence drawn from Colombian material.

Clibadium remotiflorum Schulz (Heliantheae)

Plate 133-C

Shrubby herb, 2 m tall, the branches strigose. Leaves ovate, 3-veined from well above the base, acuminate, obtuse to attenuate at the base, inconspicuously serrate, scabrous-pubescent, to 16 × 9 cm. Inflorescence a corymbose panicle, each head 2.5-3 mm long, the flowers greenish; both ray and disc florets present. Achene without a pappus. Infrequent, in disturbed areas. Paraguay and adjacent countries; but may be a synonym of *C. asperum* (Aubl.) DC. of Panama and northern South America, according to Stuessy.

Conyza apurensis HBK (Astereae)

Plate 133-D

Erect herb. Leaves alternate, linear to very narrowly obovate, irregularly remotely serrate, acute, attenuate at the base, 8 × 0.7-1.2 cm. Inflorescence an open, rather narrow, terminal panicle, the lateral branches subtended by leaf-like linear bracts, mostly ca. 2 cm long, the heads ca. 6 mm long, with many florets, the flowers white; ray flowers absent. Achene pubescent, with a pappus. Rare, along entrance road. Throughout neotropics, probably native to Asia.

Critonia billbergiana (Beurl.) King & Robinson (Eupatorieae)

Plate 134-A

Eupatorium billbergianum Beurl.

Vine. Leaves opposite, serrate, ovate, acute, inconspicuously 3-veined from near the rounded base, to 14 × 8 cm; the petiole 1-2.5 cm long. Inflorescence a pyramidal panicle with densely corymbose branches, the heads ca. 8 mm long with 6-8 florets. Corolla whitish. Achenes pappose. Uncommon, in second growth along the river. Previously known from Belize to Panama.

Critonia morifolia (Mill.) King & Robinson (Eupatorieae)

Plate 134-B

Eupatorium morifolium Mill.

Erect herb, ca. 1 m tall. Leaves opposite, serrate, ovate, acute, the base rounded to truncate, pinnately veined and very inconspicuously 3-veined from near the base, to 18 × 12 cm; the petiole 1-7 cm long. Inflorescence a terminal pyramidal panicle with densely corymbose branches; heads ca. 8 mm long with 8-12 florets. Corolla white. Achenes pappose. Uncommon, in disturbed areas. Mexico to Argentina.

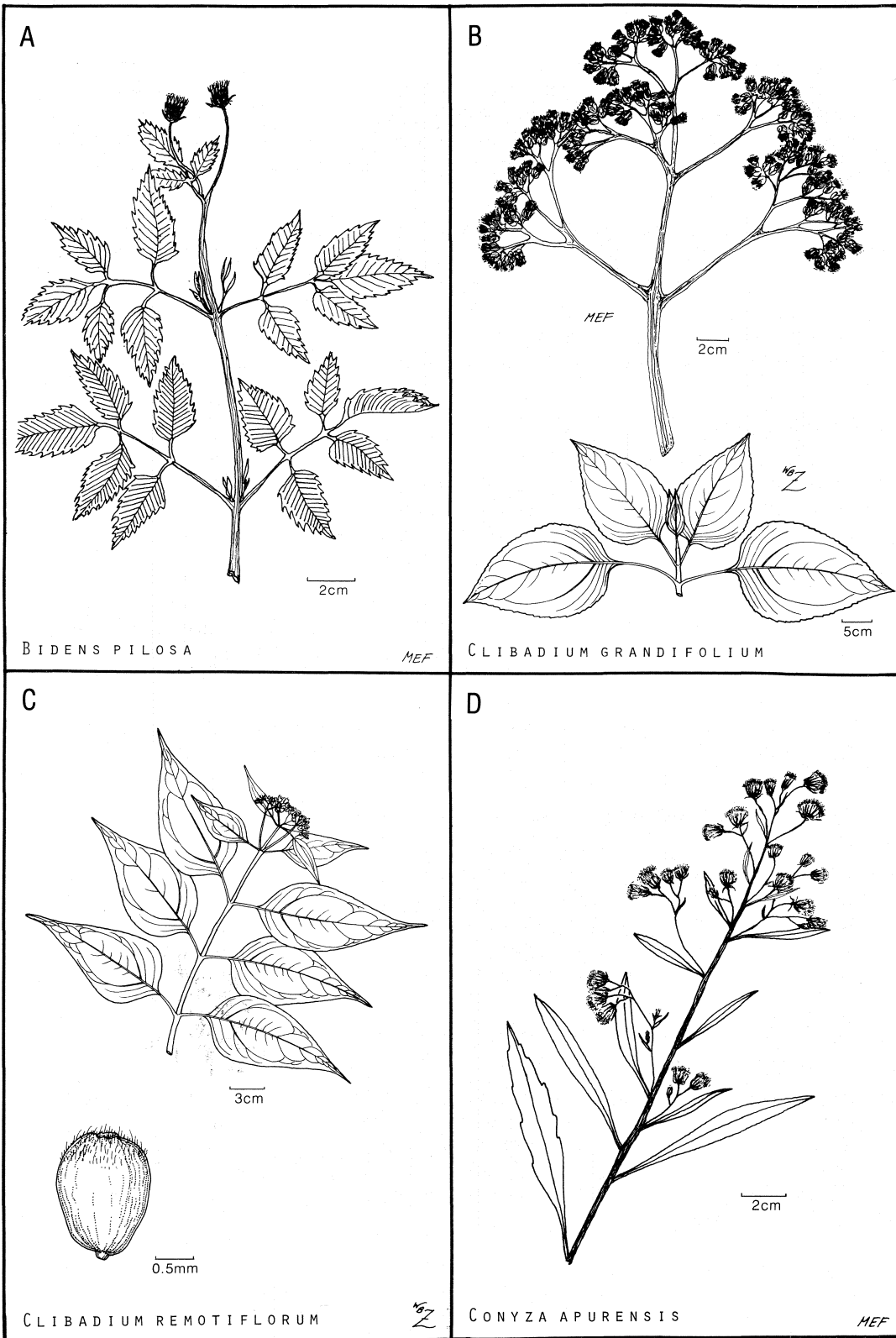


Plate 133

Eclipta alba (L.) Hassk. (Heliantheae) Plate 134-C

Small herb. Stem scabrous. Leaves opposite, scabrous, narrowly ovate, acute, cuneate, very obscurely 3-nerved from near the base, remotely serrate, to 6 × 2 cm, subsessile. Inflorescence a single axillary head or fascicle of 2-3 heads; heads on pedicels 3-4 cm long; involucre bracts leafy, appressed-pubescent, to 4 mm long; disc florets greenish-white; ray flowers white. Achenes without a pappus. Infrequent, in disturbed areas. Cosmopolitan weed.

Elephantopus mollis HBK (Vernonieae) Plate 134-D

Weedy herb. Stem scabrous. Leaves alternate, scabrous, narrowly elliptic to narrowly obovate, acute at the apex, sessile, the base decurrent and auriculate, pinnately veined, serrate, to 10 × 3 cm. Inflorescence a terminal panicle, the compound heads subtended by a whorl of 3 ovate leafy bracts ca. 1 cm long. Flowers white. Uncommon, in disturbed areas. Pantropical.

Emilia fosbergii Nichols. (Senecioneae) Plate 135-A

Weedy herb. Stem smooth. Leaves alternate, more or less obovate to dandelion-like, irregularly jagged-serrate, pinnately-veined, to at least 12 × 5 cm. Inflorescence a few-flowered terminal panicle, the involucre bracts linear, ca. 10 mm long. Flowers reddish; ray flowers absent. Rare, in disturbed areas. Pantropical; native to the Old World.

Erechtites hieracifolia (L.) Raf. ex DC. (Senecioneae) Plate 135-B

Erect herb. Leaves alternate, jaggedly serrate (dandelion-like), more or less narrowly ovate, lanceolate, sessile, the base with inconspicuous auricles. Inflorescence a cymose, terminal panicle, the involucre bracts narrow, ca. 1 cm long. Flowers greenish-yellow; ray flowers absent. Achenes with a pappus. Common, in disturbed areas. Eastern United States to Argentina.

Erechtites valerianaefolia (Wolf) DC. (Senecioneae) Plate 135-C

Erect herb, to 1 m tall. Leaves alternate, jaggedly serrate (dandelion-like), more or less narrowly ovate, lanceolate in general outline, distinctly petiolate, the base without auricles. Inflorescence a cymose, terminal panicle, the involucre bracts narrow, ca. 1 cm long. Flowers pinkish; ray flowers absent. Achenes with a pappus. Infrequent, on gravel bars along the river. Mexico to Argentina, adventive in Old World tropics.

Fleischmannia obscurifolia (Hieron.) King & Robinson (Eupatorieae)

Eupatorium obscurifolium Hieron. Plate 135-D

Erect herb to 1 m tall. Stems pilose. Leaves opposite, more or less glabrate, ovate, acuminate, truncate, irregularly 5-nerved from the base, serrate, to 7 × 4 cm. Inflorescence a few-headed terminal corymb, the involucre bracts ovate, setate-acuminate, several-seriate, the inner (longer) ca. 7 mm long. Flowers lavender; ray flowers absent. Infrequent, along roadsides. Endemic to western Ecuador.

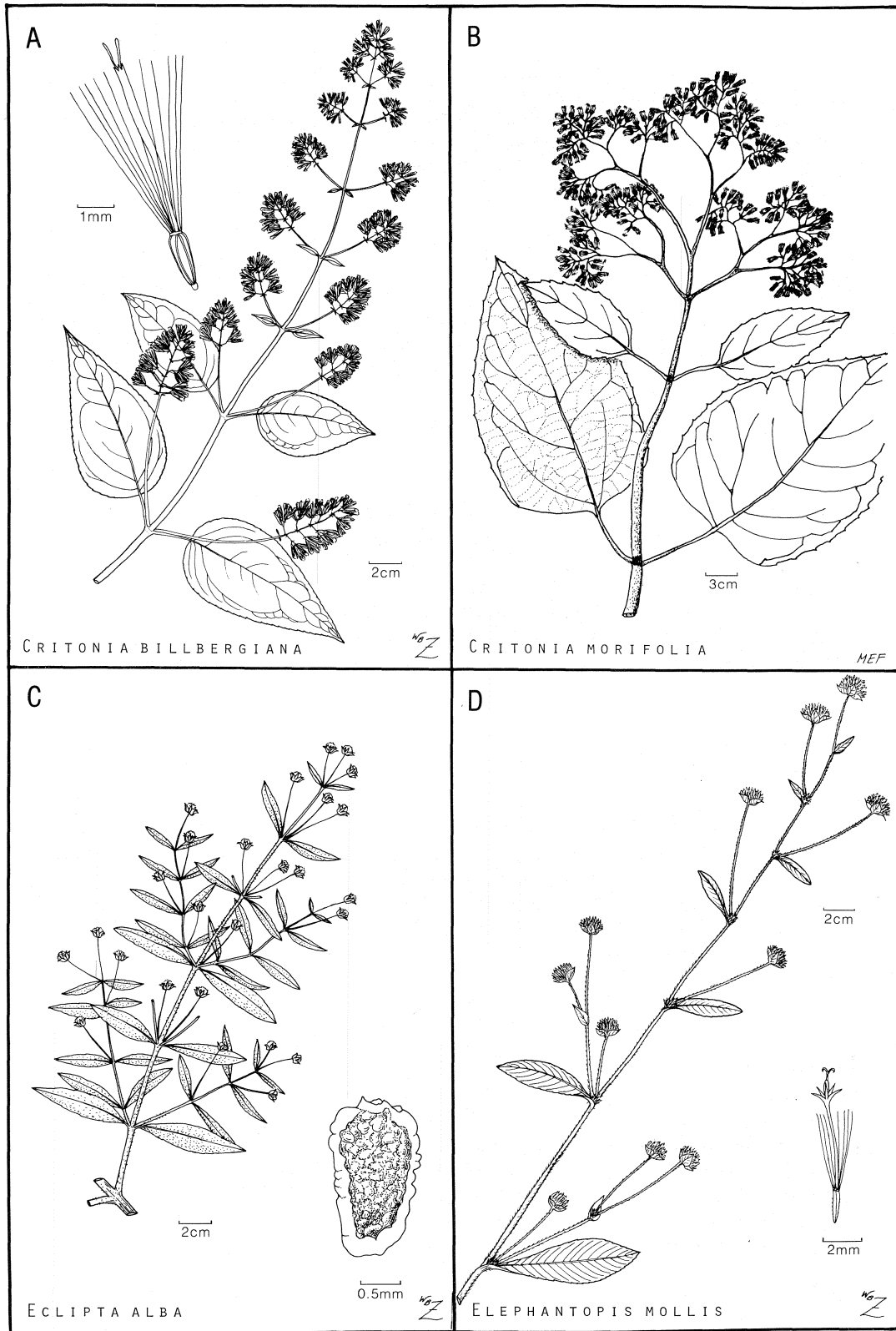


Plate 134

***Garcilassa rivularis* P. & E. (Heliantheae)**

Plate 136-A

Erect herb, ca. 1 m tall, the branches sparsely puberulous. Leaves alternate, 3-veined from just above the base, ovate, serrate, acuminate, obtuse at the base, sparsely puberulous and slightly scabrous, to 11 × 6 cm. Inflorescence a few-headed umbellate-paniculate cluster, usually subtended by one or two leaf-like bracts, each head 5 mm long with 3-4 greenish disc flowers. Infrequent, in disturbed areas. Costa Rica to Bolivia.

***Gnaphalium* cf. *cheiranthifolium* Lam. (Inuleae)**

Plate 136-B

Suberect herb, to 40 cm tall. Densely sericeous with long white trichomes throughout. Leaves alternate, linear, to 6 × 0.8 cm. Inflorescence terminal, paniculate. Flowers white. Infrequent, on rocky beaches. Throughout much of tropical South America.

***Hebeclinium macrophyllum* (L.) DC. (Eupatorieae)**

Plate 136-C

Coarse herb to 2 m tall. Stem puberulous. Leaves opposite, ovate, glabrous above, puberulous below, acute, the base more or less truncate, irregularly 3-veined from base, to 12 × 5 cm; the petiole to 4 cm long. Inflorescence a many-flowered terminal panicle, the involucre bracts appressed-puberulous, in several series, the ultimate tips obtuse, the inner (largest) to 6 mm long. Flowers white; ray flowers absent. Achenes pappose. Uncommon, in disturbed areas, especially at the forest edge. Widespread in Central and South America.

***Hidalgoa ternata* Llave (Heliantheae)**

Plate 136-D

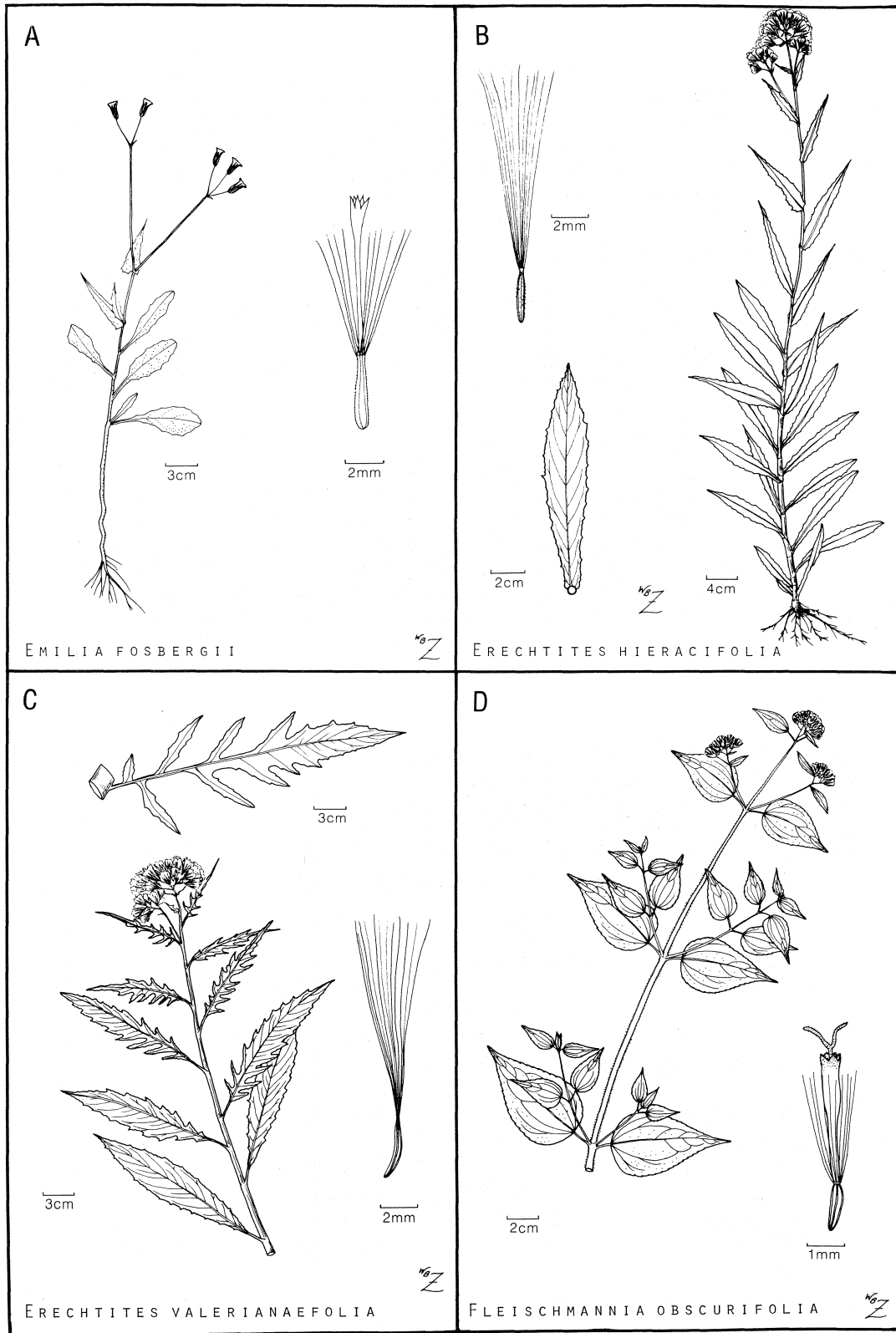
Vine. Leaves 3-foliolate, opposite, the terminal leaflet rhombic-elliptic, the lateral leaflets very asymmetrically ovate, to 7 × 4 cm, serrate. Inflorescence a single axillary head, the peduncle to 15 cm long. Flowers bright orange-red; ray flowers 1.5 cm long. Infrequent, but conspicuous at the forest edge. Southern Mexico to Peru.

***Jaegeria hirta* (Lag.) Less. (Heliantheae)**

Plate 137-A

Subprostrate herb. Stems pilose. Leaves opposite, sessile, narrowly ovate, acute, cuneate, subentire, ciliate, to 2 × 1 cm. Inflorescence a fascicle of (1-)3 axillary or terminal heads on peduncles 1-1.5 cm long; involucre bracts leafy, hispid at the base, ca. 2 mm long. Flowers yellow; ray flowers absent. Achenes without a pappus. Rare, on gravel bars in the riverbed. Northern Mexico to Uruguay.

Common name: "Mielcilla"



Melanthera aspera (Jacq.) Small (Heliantheae) Plate 137-B

Herb. Stems and leaves scabrous. Leaves opposite, ovate, acute, more or less truncate at the base, irregularly 3-veined from near the base, serrate, to 11 × 7 cm; the petiole 2-4 cm long. Inflorescence axillary, a single globose head, or forked with two heads, the involucrel bracts acute, 4 mm long, the outer series foliaceous, the rest hyaline-chartaceous. Flowers white; ray flowers absent. Achene without a pappus or with a few bristles. Uncommon, in disturbed areas. Florida to Venezuela and Ecuador.

Mikania cordifolia (L.f.) Willd. (Eupatorieae) Plate 137-C

Vine. Leaves opposite, ovate, acute, cordate at base, subentire, mostly 4-5 cm long; the petiole mostly 2-2.5 cm long. Inflorescence axillary and terminal, paniculate, many-flowered, the heads narrow, ca. 7 × 2 mm, the flowers white; ray flowers absent. Achene with a pappus. Infrequent, in disturbed areas. Widespread in tropical America.

Mikania guaco H. & B. (Eupatorieae) Plate 137-D

Vine. Leaves opposite, elliptic-ovate, acute to acuminate, entire, the base cuneate, to 14 × 6 cm, distinctly subscabrous, pinnately veined, purple below with green along the veins when young; the petioles 1.5-3 cm long. Inflorescence (in Panama) paniculate, many-flowered, the narrow 8-10 mm long heads in clusters of 3. Flowers white; ray flowers absent. Infrequent, at the edge of the forest. Mexico to Brazil. Known only from the sterile juvenile plants at Río Palenque which are quite distinct in their purple-mottled leaf undersides.

Common name: "Guaco"

Mikania hookeriana DC. (Eupatorieae) Plate 138-A

Vine. Leaves opposite, entire, ovate, acute, more or less triangular in outline, usually with rather pointed basal lobes, truncate at the base, 5-veined from at or near the base, to 10 × 7 cm; the petiole 4-6 cm long. Inflorescence a pyramidal panicle with paniculate branches, mostly axillary, the heads ca. 8 mm long, with 4 florets. Corolla white, ca. 5 mm long. Achenes pappose. Uncommon, at forest edge along the river. Southern Mexico to Brazil.

Mikania leiostachya Benth. (Eupatorieae) Plate 138-B

Vine. Leaves opposite, ovate, acuminate, the base rounded, 5-nerved from the base, the margin entire, to 15 × 6 cm; the petiole to 3 cm long. Inflorescence axillary, the long narrow racemes clustered into few-branched panicles. Flowers white. Achenes with a pappus. Uncommon, in mature forest. Central America and northern South America.

Piptocarpha poeppigiana (DC.) Baker (Vernonieae) Plate 138-C

Woody vine. Leaves alternate, elliptic, acute to acuminate, rounded and somewhat oblique at the base, densely tannish tomentose below with stellate trichomes, to 10 × 4.5 cm; the petiole ca. 1.5 cm long. Inflorescence a short, few-flowered, axillary panicle. Flowers brownish. Infrequent, in mature forest. Colombia to Peru; *P. chontalensis* Baker of Belize to Panama is probably conspecific.

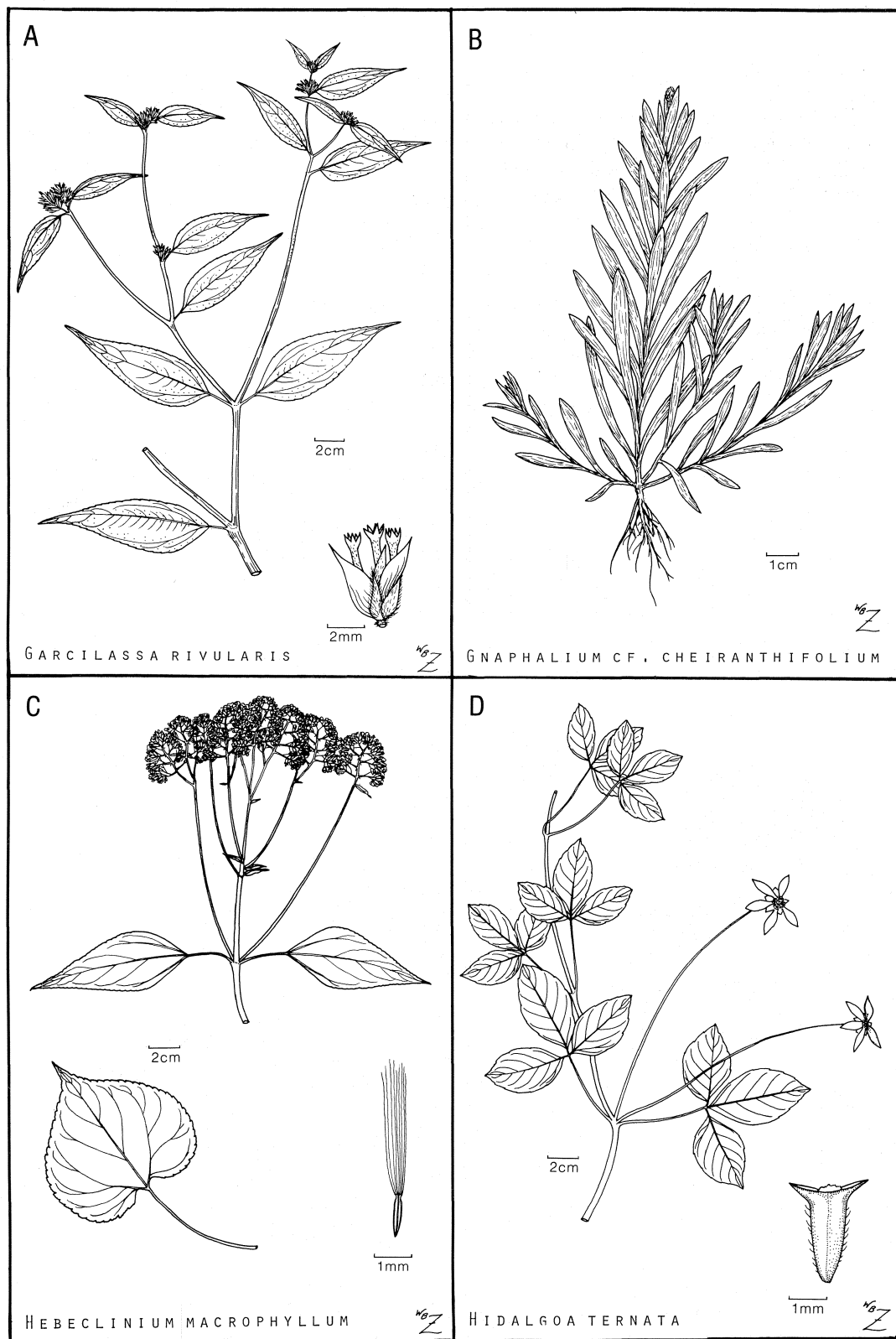
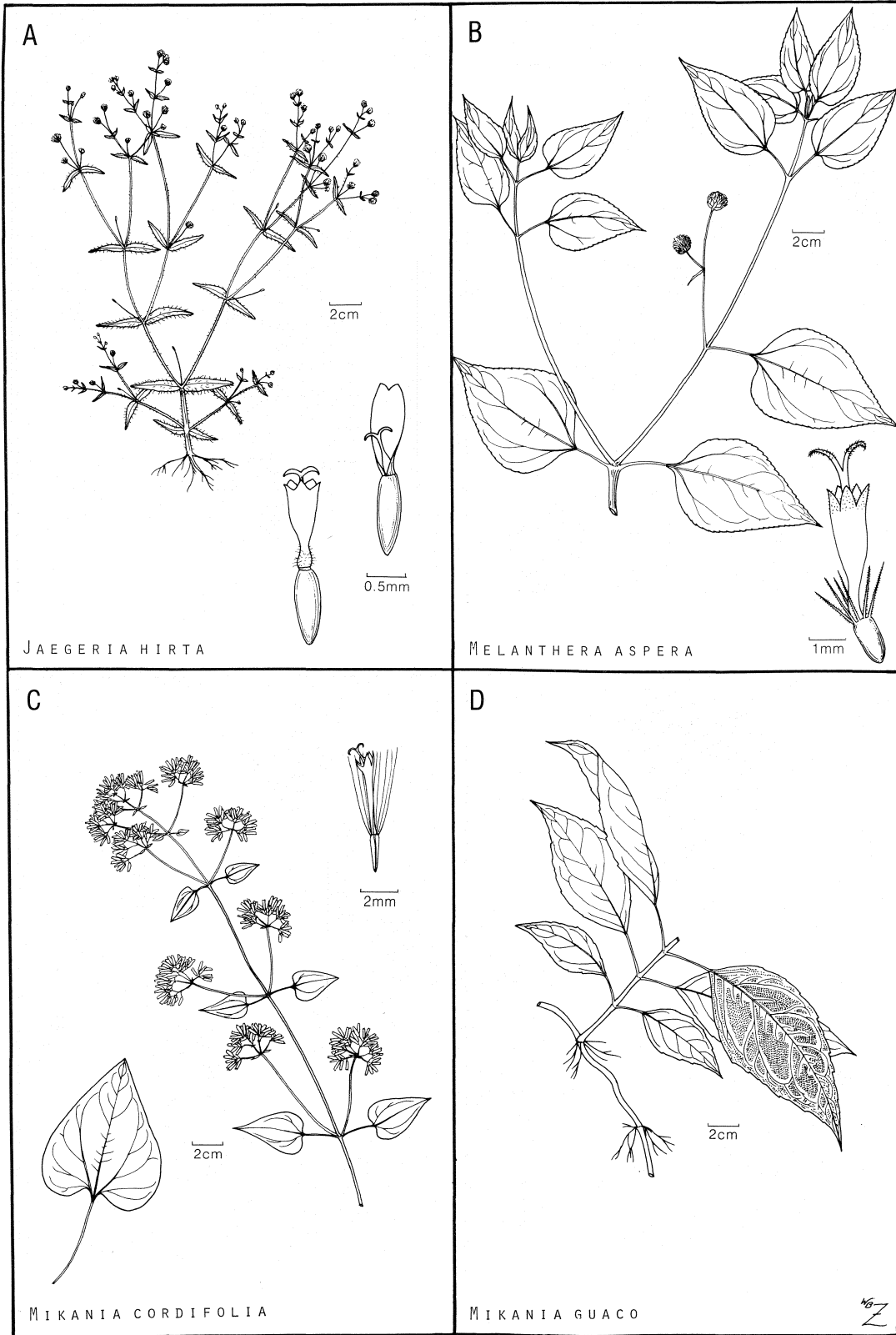


Plate 136



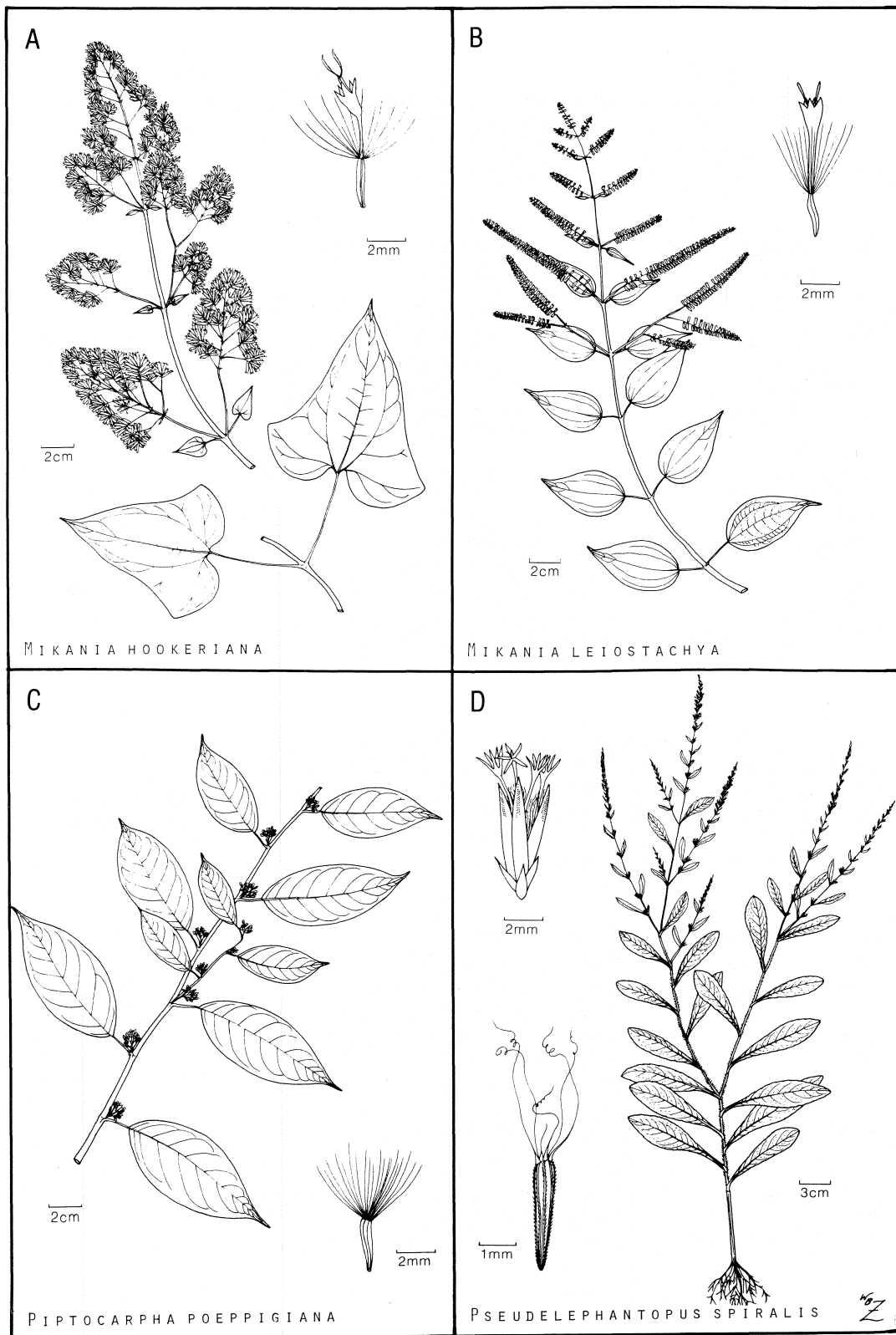


Plate 138

Pseudelephantopus spiralis (Less.) Cronq. (Vernonieae) Plate 138-D

Weedy herb. Stem scabrous. Leaves alternate, scabrous, oblanceolate, obtuse, sessile, pinnately-veined, serrate, to 14 × 4 cm. Inflorescence of several elongate spikes, with each single 4-floreted head in the axil of a narrow leafy bract. Flowers pinkish. Very common in lawns and roadsides. Costa Rica and the Lesser Antilles to northern Argentina.

Common name: "Chicorea"+, "Escoba Real"

Schistocarpha eupatorioides (Fenzl) Kuntze (Senecioneae) Plate 139-A

Schistocarpha oppositifolia (Kuntze) Rydb.

Coarse erect weed, to 2 m tall. Leaves opposite, ovate, acute, serrate, truncate but with a decurrent base, the blade to 14 × 10 cm; the petiole to 5 cm long. Inflorescences many-headed terminal and axillary panicles. Flowers yellow; ray flowers hardly distinct. Achene with numerous fine hairs 5-6 mm long. Common, in disturbed areas. Mexico to Bolivia.

Sciadocephala schultze-rhohofiae Mattf. (Eupatorieae) Plate 139-B

Erect herb, to 50 cm tall. Leaves opposite, rhombic-elliptic, acute, cuneate, 3-nerved from above the base, coarsely serrate, to 15 × 7.5 cm; the petiole to 2 cm long. Inflorescence a few-flowered terminal panicle, the involucre bracts oblanceolate, round-tipped, ca. 5 mm long. Flowers greenish. Achenes ca. 5 mm long, the pappus reduced to three to five gland-tipped bristles. Infrequent, in mature forest. Endemic to Pacific Ecuador.

Spilanthes alba L'Her. (Heliantheae) Plate 139-C

Erect herb. Leaves opposite, ovate, more or less acute, the base truncate, 3-veined from the base, serrate, to 5.5 × 2.5 cm; the petiole ca. 1 cm long. Inflorescence one or two axillary or terminal pedicellate heads, these 5-8 mm long, the involucre bracts narrowly ovate, 4 mm long. Disk and ray flowers yellow. Achenes without a pappus, the margin thin. Uncommon, on rocky beaches. Mexico and West Indies to Peru.

Spilanthes paniculata DC. (Heliantheae) Plate 139-D

Erect herb. Leaves broadly ovate, mostly obtuse, the base truncate, 3-veined from the base, slightly serrate, to 6 × 5 cm, the petiole ca. 2 cm long. Inflorescence and flowers as in *S. alba*, but the achene margins thickened. Infrequent, on river banks. Native to Indian Ocean region, becoming pantropical, apparently the first record for Ecuador.

Synedrella nodiflora (L.) Gaertn. (Heliantheae) Plate 140-A

Erect or prostrate herb, less than 1 m tall. Leaves opposite, narrowly elliptic, acute, cuneate, subsessile, 3-nerved from the base, serrate, scabrous, to 9 × 4.5 cm. Inflorescence of sessile, axillary, yellow flowers. Common, in disturbed areas. Native to tropical America, now almost cosmopolitan.

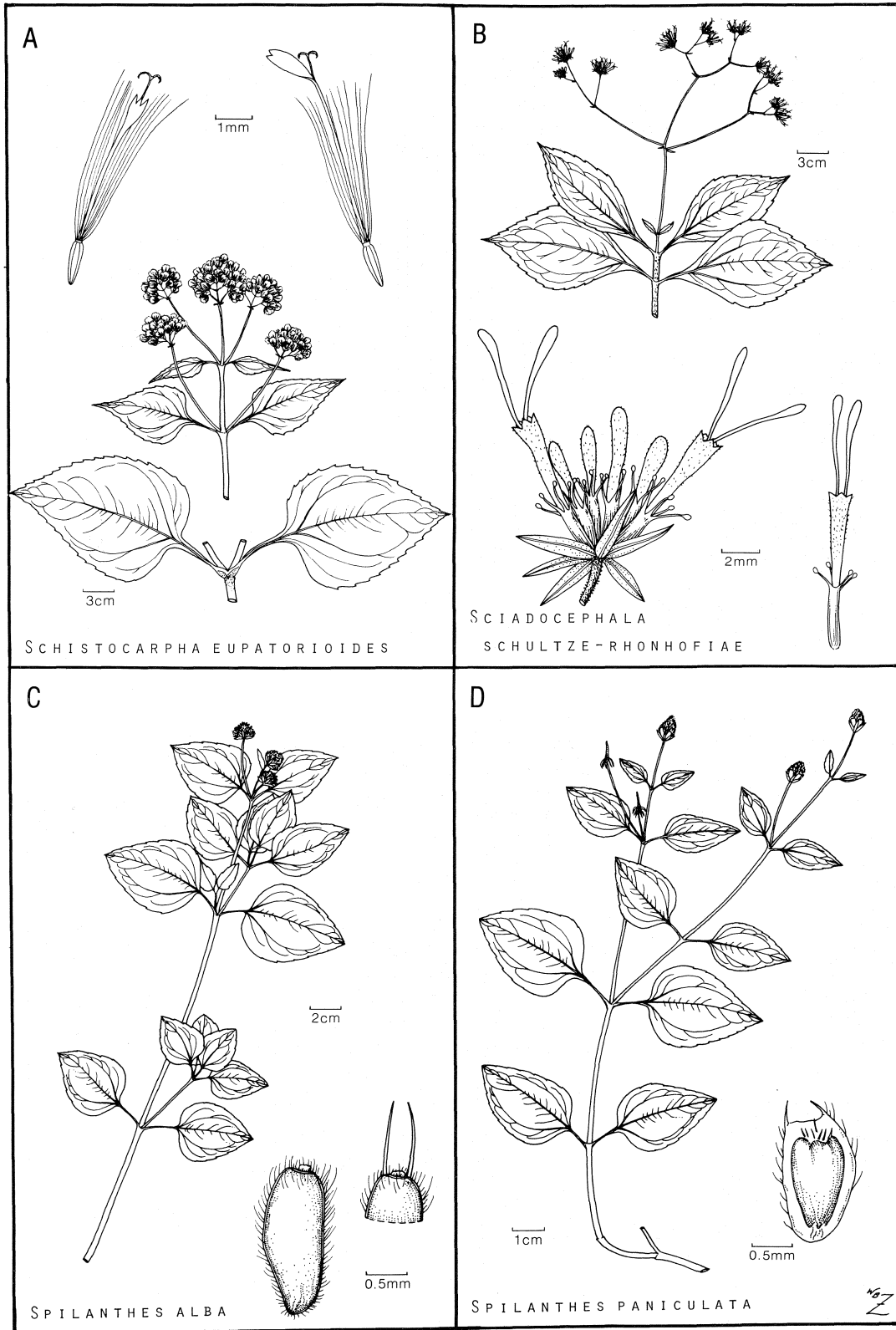


Plate 139

***Tagetes erecta** L. (Tageteae)

Plate 140-B

Herb to 1 m tall. Leaves aromatic, compound, 5-to 17-pinnate; leaflets elliptical, serrate, 3-8 × 0.4-0.8 cm. Inflorescence a single terminal head, the outer involucre bracts yellow-green, to 3 cm long. Ray and disk flowers yellow or orange. Cultivated around homesites. Native to Mexico. Common name: "Flor de Muerto", "Marigold"

Tessaria integrifolia R. & P. (Inuleae)

Plate 140-C

Shrub or small tree, to 3 m tall. Leaves alternate, grayish, linear-oblong to very narrowly elliptic, acute, tapering to the base, remotely serrate, pinnately veined, to 10 × 1.6 cm, conspicuously grayish. Inflorescence an open flat-topped panicle, the involucre bracts ovate, in several series. Flowers pinkish; several ray flowers and a single disc flower present. Achenes with a pappus. Rare, on gravel bars along the river. Central America to Amazonian Peru. Inflorescence illustration adapted from "Flora of Venezuela."

Verbesina gigantea Jacq. (Heliantheae)

Plate 140-D

V. myriocephala Schultz-Bip.

Large, erect herb, to 3 m tall. Leaves alternate, pinnately 3-to 7-lobed to near the middle, to 45 × 25 cm, tapering to a subsessile base. Inflorescence an open cymose panicle, the involucre bracts in several series. Flowers white; with both disc and ray flowers. Achenes broadly winged, the pappus reduced to two awns ca. 2 mm long. Infrequent, along the highway near the entrance. Mexico to Pacific Ecuador.

Vernonia baccharoides HBK (Vernonieae)

Plate 141-A

Tree, to 20 meters tall. Leaves alternate, narrowly ovate, acute at the apex, cuneate to obtuse at the base, pinnately veined, serrulate to subentire. Inflorescence a many-flowered, open, terminal panicle. Involucre bracts several-seriate. Flowers white; ray flowers lacking. Very common, in disturbed areas; most abundant in ca. 3 year old second growth. Colombia to Bolivia on both sides of the Andes.

Common name: "Chilco"+

Wedelia trilobata (L.) Hitchc. (Heliantheae)

Plate 141-B

Prostrate herb. Leaves opposite, narrowly elliptic, usually 3-lobed in part, sessile, to 11 × 3 cm, 3-nerved from well above the base. Inflorescence a single terminal head, the outer involucre bracts leafy, oblanceolate, much longer (ca. 1 cm long) than the inner. Ray and disc flowers yellow. Uncommon, in disturbed areas. Native to tropical America, now pantropical.

Wulffia baccata (L.f.) Kuntze (Heliantheae)

Plate 141-C

Rambling vine. Leaves opposite, entire to serrate, elliptic, acuminate, rounded at the base, scabrous, to 20 × 12 cm, 3-veined from near the base. Flower heads pedicellate, terminal, or axillary near the apex of the branches, to 2 cm in diameter. Flowers yellow-orange; ray flowers present. Fruits black, berry-like. Infrequent, in disturbed forest. Panama to Bolivia and Paraguay.

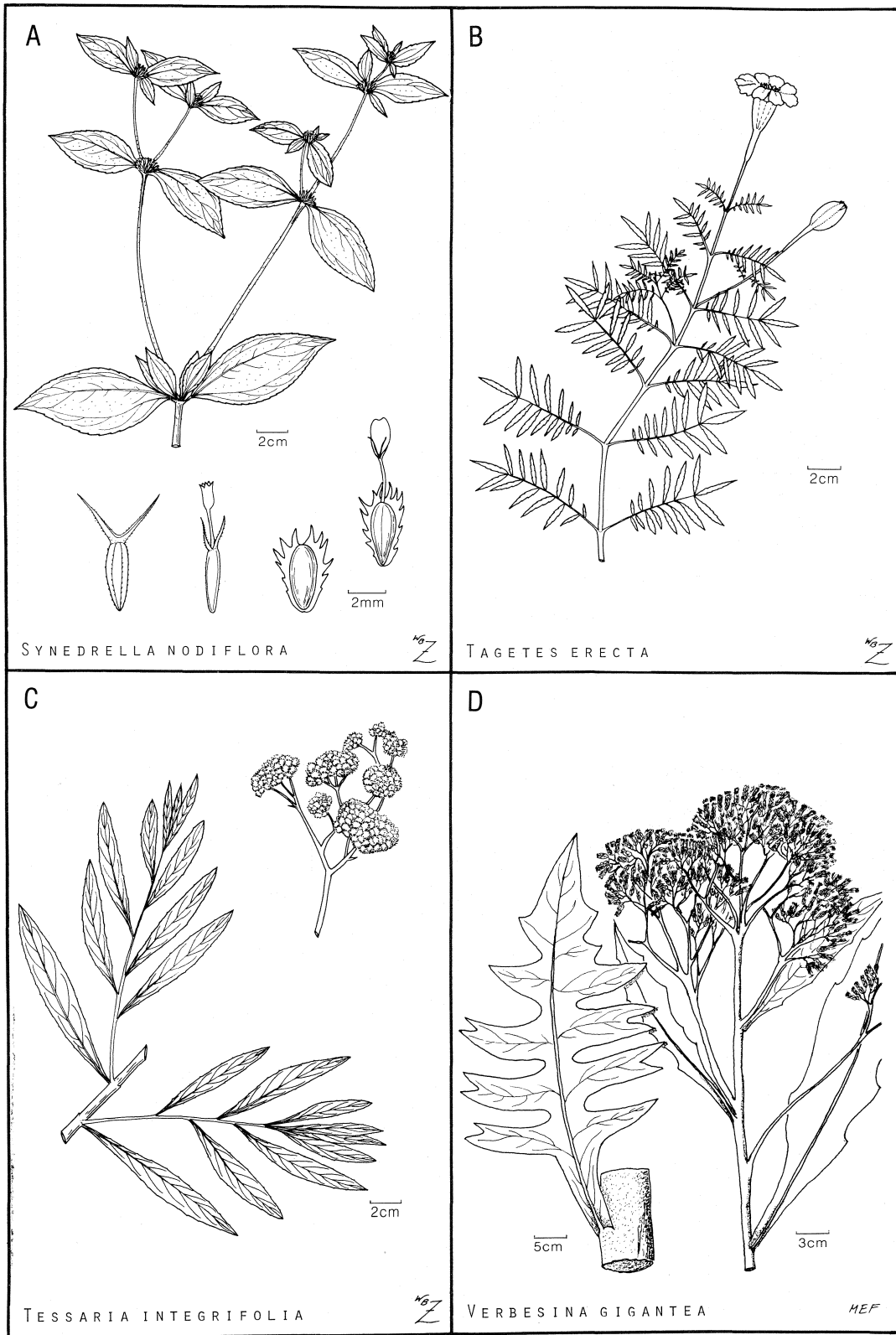


Plate 140

