

## Family 14. BURSERACEAE

BY JOSEPH NELSON ROSE

Shrubs or trees, more or less aromatic. Leaves alternate, usually pinnate, deciduous, the rachis often winged; leaflets entire, toothed, or lacinate; stipules none. Flowers small, perfect or polygamo-dioecious; inflorescence various, usually a more or less compound panicle but often consisting of a single flower. Sepals 3-5, united into a short tube. Petals small, as many as the sepals and alternating with them, distinct or rarely united into a short tube, valvate or imbricate in the bud. Disk a more or less prominent ring. Stamens twice as many as petals; filaments free, naked, short; sterile stamens none; anthers 2-celled. Ovary superior, 4- or 5-celled or fewer-celled by abortion. Style distinct but usually very short; stigma broad. Ovules normally 2 in each cell, pendent. Fruit a drupe containing 1-5 stones; testa of seed membranaceous; endosperm none; cotyledons usually membranaceous.

Petals in the bud imbricate.

Petals in the bud valvate.

Petals united.

Petals distinct.

Calyx truncate.

Calyx lobed.

1. ELAPHRIUM.

2. TETRAGASTRIS.

3. DACRYODES.

4. ICICA.

### 1. ELAPHRIUM Jacq. Enum. Pl. Carib. 3. 1760.

*Terebinthus* P. Br. Hist. Jam. 345. 1756. Not *Terebinthus* Mill. 1754.

*Bursera* Jacq.; L. Sp. Pl. ed. 2. 471. 1762. Not *Bursera* Loeffl. 1758.

Shrubs or trees. Leaves various, from simple to twice compound, small to very large, alternate; leaves or leaflets entire, toothed or even lacinate, smooth to very pubescent. Inflorescence axillary, more or less compound or sometimes of only a single flower. Flowers small, polygamous. Calyx small, 4- or 5-lobed, the lobes equal and spreading, more or less persistent. Petals distinct, 4 or 5, inserted on the base of the disk, ovate to oblong, much longer than the calyx-lobes, imbricate in the bud, afterwards spreading. Stamens 8 or 10, distinct, inserted at the base of the disk. Disk an entire ring. Ovary ovoid, sessile, 3-celled. Fruit a drupe, globose, or more or less 3-angled, often oblique; epicarp glabrous or pubescent, splitting into 2 or 3 leathery valves; stones hard and bony, more or less covered with a fleshy, weakly aromatic pulp.

Type species, *Elaphrium tomentosum* Jacq.

#### 1. Petiole and rachis wingless.

##### A. Leaves simple or unifoliolate, rarely trifoliolate.

Leaves toothed.

Peduncles elongate, several-flowered.

Peduncles short, 1-flowered.

1. *E. epinnatum*.

2. *E. subtrifoliatum*.

Leaves entire.

Inflorescence elongate, often quite as long as the leaves.

Inflorescence short, often consisting of a single flower.

3. *E. jamaicense*.

Leaves green.

Leaves obtuse.

Petioles short.

Petioles longer (5-15 mm. long).

4. *E. Jonesii*.

5. *E. Nashii*.

Leaves acute.

Peduncles short (3-4 mm. long).

Peduncles long (about 40 mm.).

6. *E. simplicifolium*.

7. *E. cerasifolium*.

Leaves glaucous.

8. *E. glaucum*.

##### B. Leaves compound.

a. Leaflets entire.

Leaflets small.

- Leaflets dull, often a little glaucous.  
 Leaflets shining.  
 Leaflets large.  
 Leaflets narrow.  
 Leaflets 5-11, linear-oblong to linear-lanceolate.  
 Leaflets 3-5, oblong to oblanceolate.  
 Leaflets broad.  
 Ovary and fruit pubescent.  
 Leaflets abruptly acuminate.  
 Fruit in a short, compact raceme.  
 Fruit in an elongate panicle or raceme.  
 Leaflets gradually acuminate.  
 Ovary and fruit glabrous.  
 Branches and rachis of the leaf hirsute (sometimes glabrous in the first).  
 Leaflets thin; bark flaking off.  
 Leaflets thick; bark persistent.  
 Branches and rachis of the leaf glabrous.  
 Leaflets 3-5.  
 Leaflets more than 5.  
 Leaflets strongly reticulate.  
 Leaflets not strongly reticulate.  
 Leaflets glabrous.  
 Leaflets pubescent.  
 Leaflets glabrous above.  
 Fruit oblong in outline.  
 Fruit orbicular in outline.  
 Leaflets pubescent above as well as below.  
 Adult leaflets densely reddish-pubescent.  
 Adult leaflets with scanty pubescence above.
- b. Leaflets toothed.  
 Lateral nerves parallel and very prominent.  
 Lateral nerves much less prominent.  
 Leaflets 1-3 pairs.  
 Leaflets acuminate.  
 Leaflets merely acute.  
 Leaflets 5-17 pairs.  
 Leaflets 2-4 cm. long, narrowly lanceolate.  
 Leaflets 1-1.5 cm. long, oblong.
- 2. Petiole and rachis more or less winged.**
- A. Leaves more or less bipinnate.  
 Leaflets large, sometimes 2.5 cm. long, toothed.  
 Leaflets rounded at base.  
 Leaflets acute at base.  
 Leaflets small, 1 cm. long or less.  
 Calyx-lobes as long as or longer than the petals; leaflets glabrous beneath.  
 Calyx-lobes shorter than the petals; leaflets hairy beneath.
- B. Leaves simply pinnate.  
 a. Leaflets glabrous or nearly so throughout.  
 Leaflets entire.  
 Young branches and rachis of the leaf pubescent.  
 Leaflets 2 or 4 pairs, obtuse.  
 Leaflets more than 4 pairs, acute.  
 Young branches and rachis of the leaf glabrous.  
 Leaflets broadly oblong.  
 Branches dark, not reddish.  
 Fruit apiculate.  
 Fruit not apiculate.  
 Branches reddish.  
 Rachis of the leaf narrowly but distinctly winged.  
 Rachis of the leaf indistinctly winged.  
 Leaflets narrowly oblong to linear.  
 Bark of first-year branches reddish. (Lower Californian and western Mexican species.)  
 Bark of the first-year branches dark-gray, not reddish. (Central Mexican species.)  
 Leaflets closely set, 3-5 mm. apart; bark glaucous.  
 Leaflets distinct, 6-8 mm. apart.
- Leaflets toothed.  
 Leaflets short and more or less rounded.  
 Rachis of the leaf dentate.  
 Rachis of the leaf entire.  
 Peduncles glabrous; veins of leaves not prominent.  
 Peduncles pubescent; veins of leaves prominent.  
 Leaflets elongate, more or less pointed.
9. *E. Schaffneri*.  
 10. *E. obovatum*.  
 11. *E. angustatum*.  
 12. *E. inaguense*.  
 13. *E. cinereum*.  
 14. *E. occidentale*.  
 15. *E. grandifolium*.  
 16. *E. Simaruba*.  
 17. *E. Hollickii*.  
 18. *E. ovalifolium*.  
 19. *E. longipes*.  
 20. *E. attenuatum*.  
 21. *E. acuminatum*.  
 22. *E. subpubescens*.  
 23. *E. heterophyllum*.  
 24. *E. arboreum*.  
 25. *E. Kerberi*.  
 26. *E. lancifolium*.  
 27. *E. trijugum*.  
 28. *E. multijugum*.  
 29. *E. Karwinskii*.  
 30. *E. diversifolium*.  
 31. *E. collinum*.  
 32. *E. bipinnatum*.  
 33. *E. gracile*.  
 34. *E. aridum*.  
 35. *E. Galeottianum*.  
 36. *E. apterum*.  
 37. *E. Purpusii*.  
 38. *E. Covillei*.  
 39. *E. odoratum*.  
 40. *E. microphyllum*.  
 41. *E. morelense*.  
 42. *E. multifolium*.  
 43. *E. glabrifolium*.  
 44. *E. fagaroides*.  
 45. *E. Nelsoni*.

- Inflorescence elongate ; pedicels slender.  
 Leaflets pubescent on both surfaces, usually 7 or fewer. 46. *E. pubescens*.  
 Leaflets nearly glabrous, generally ciliate, usually more than 7. 47. *E. pilosum*.
- Inflorescence compact ; pedicels short.  
 Teeth of leaflets prominent, closely set ; fruit wrinkled. 48. *E. confusum*.  
 Teeth of leaflets few, if any ; fruit not wrinkled.  
 Leaflets at most acute. 49. *E. tenuifolium*.  
 Leaflets acuminate. 50. *E. fragile*.  
 Leaflets 3-7. 51. *E. rubrum*.  
 Leaflets more than 7. 52. *E. Pringlei*.  
 Leaflets lanceolate, usually 6 or 7 pairs.  
 Leaflets linear-lanceolate, more than 7 pairs.
- b. Leaflets not glabrous throughout.  
 Adult leaflets glabrous above, but more or less pubescent beneath ; rachis pubescent.  
 Leaflets elongate, linear to linear-lanceolate. 53. *E. bicolor*.  
 Leaflets short-ovate to oblong. 54. *E. biflorum*.  
 Leaflets 3. 55. *E. mexicanum*.  
 Leaflets more than 3. 56. *E. brachypodum*.  
 Leaflets 11-15. 57. *E. penicillatum*.  
 Fruit in panicles.  
 Fruit solitary. 58. *E. Delpechianum*.  
 Leaflets 5-9. 59. *E. laxiflorum*.  
 Leaflets acuminate. 60. *E. filicifolium*.  
 Leaflets at most acute. 61. *E. longipedunculatum*.  
 Inflorescence pubescent ; leaflets acute at base.  
 Leaflets twice as long as broad.  
 Leaflets only a little longer than broad.  
 Leaflets serrate.  
 Leaflets crenate.  
 Inflorescence probably always glabrous.
- Adult leaflets pubescent on both sides.  
 Leaflets not coriaceous. 62. *E. pannosum*.  
 Leaflets entire or subentire.  
 Leaflets more or less toothed.  
 Flowers subsessile. 63. *E. asplenifolium*.  
 Leaflets 15-21. 64. *E. sessiliflorum*.  
 Leaflets 3 cm. long ; fruit 8 mm. in diameter. 65. *E. quereatarense*.  
 Leaflets 5-7. 5 cm. long ; fruit 7 mm. in diameter.  
 Leaflets 7-9. 66. *E. submoniliforme*.  
 Flowers pedicelled. 67. *E. Palmeri*.  
 Fruit pubescent.  
 Fruit glabrous.  
 Rachis of the leaf toothed.  
 Rachis of the leaf not toothed.  
 Branches dark-red or blackish. 68. *E. Aloexylon*.  
 Margin of leaflets slightly revolute. 69. *E. rhoifolium*.  
 Margin of leaflets not revolute.  
 Branches light-reddish or gray. 70. *E. Macdougalii*.  
 Branches reddish ; base of stone light. 71. *E. Goldmani*.  
 Branches grayish ; base of stone dark.
- Leaflets coriaceous and strongly rugose, especially beneath. 72. *E. Schiedeianum*.  
 Leaflets not rugose above.  
 Leaflets strongly rugose above.  
 Pubescence on under surface of the leaflets rather scanty.  
 Rachis of the leaf more or less toothed ; inflorescence compact. 73. *E. glabrescens*.  
 Rachis of the leaf entire ; inflorescence less compact than in the last. 74. *E. jorullense*.  
 Pubescence on under surface of the leaflets abundant and more or less matted.  
 Leaflets 11-21. 75. *E. lanuginosum*.  
 Leaflets 5-9. 76. *E. excelsum*.  
 Rachis of the leaf toothed. 77. *E. cuneatum*.  
 Rachis of the leaf entire.

### 1. *Elaphrium epinnatum* Rose, sp. nov.

A tree 5-8 meters high ; second-year branches dark-brown, glabrous ; first-year branches not seen ; leaves clustered at the ends of branches, simple, 2-4 cm. long, obtuse, broad at base, crenate, slightly pubescent on both surfaces ; petioles 1-2 cm. long ; inflorescence usually longer than the leaves, drooping, apparently few-flowered, in fruiting specimens bearing only 1-3 drupes ; fruiting pedicels slender, 7-10 mm. long ; drupes globose, broad at apex, 6 mm. long, glabrous.

Type collected at Cape San Lucas, Lower California, December 30, 1905, *Nelson & Goldman* 7379 (U. S. Nat. Herb. no. 565456).

This species is perhaps nearest *E. cerasifolium*, though the leaves are not glandular beneath, but are hairy on both sides and more strongly toothed as well as more obtuse.

## 2. *Elaphrium subtrifoliatum* Rose.

*Terebinthus subtrifoliata* Rose, Contr. U. S. Nat. Herb. 10: 122. 1906.

A low shrub, glabrous throughout; branches dark; leaves simple or trifoliolate, cuneate at base, rounded at apex, crenate, glabrous on both sides, 25 mm. long or less; flowers 1-3 in the axils of the leaves; pedicels short, 2-3 mm. long, reflexed in fruit; drupes somewhat 3-angled, glabrous, 3 mm. long.

TYPE LOCALITY: West of Bolaños, Jalisco.

DISTRIBUTION: Hot valleys of Jalisco.

## 3. *Elaphrium jamaicense* Rose.

*Bursera simplicifolia* DC. Prodr. 2: 78. 1825. Not *E. simplicifolium* Schlecht.

*Terebinthus simplicifolia* Britton, Bull. Torrey Club 35: 342. 1908.

A tree, 12-14 meters high; branches slender, short, bearing a cluster of leaves near their tips; leaves 1-foliolate; leaflets 4.5-6 cm. long, oblong to obovate, obtuse, entire, somewhat coriaceous; inflorescence an interrupted raceme nearly as long as the leaves; flowers greenish-yellow, sweet-scented; drupes 6-7 mm. long.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: Southern Jamaica, near the coast.

## 4. *Elaphrium Jonesii* Rose.

*Bursera Jonesii* Rose, Contr. U. S. Nat. Herb. 3: 314. 1895.

*Terebinthus Jonesii* Rose, Contr. U. S. Nat. Herb. 10: 119. 1906.

A small shrub with slender, grayish branches; leaves simple, oval to obovate, rounded or slightly indented at the apex, broadly cuneate at the base, entire, 3 cm. long or less; flowers solitary on short, reflexed pedicels; drupes oval, 5 mm. in diameter.

TYPE LOCALITY: Near the city of Colima, Colima.

DISTRIBUTION: Central Mexico to Guatemala.

## 5. *Elaphrium Nashii* (Britton) Rose.

*Terebinthus Nashii* Britton, Bull. Torrey Club 35: 342. 1908.

A tree, about 3 meters high; branches smooth, reddish, glabrous; leaflets 1-3, somewhat glaucous, linear-oblong, entire, 3-5 cm. long, obtuse or acute, narrowed at the base, pale-green, indistinctly veined, thickish; inflorescence short, few-flowered; calyx-lobes ovate, persistent; pedicels 2-5 mm. long; drupes 6-7 mm. long.

TYPE LOCALITY: Gonaïves to La Hotte Rochée, Haïti.

DISTRIBUTION: Haïti.

## 6. *Elaphrium simplicifolium* Schlecht. *Linnaea* 16: 532. 1842.

*Bursera Schlechtendalii* Engler, in DC. Monog. Phan. 4: 41. 1883.

*Terebinthus Schlechtendalii* Rose, Contr. U. S. Nat. Herb. 10: 122. 1906.

Branches long, brown or grayish, glabrous; leaves simple, 3-4.5 cm. long, ovate, acute; flowering branches short; drupes subglobose, slightly 3-angled.

TYPE LOCALITY: Mexico; probably in Vera Cruz.

DISTRIBUTION: Hot part of Vera Cruz to Chiapas.

## 7. *Elaphrium cerasifolium* (Brand.) Rose.

*Bursera cerasifolia* Brand. Proc. Calif. Acad. II. 3: 121. 1891.

*Terebinthus cerasifolia* Rose, Contr. U. S. Nat. Herb. 10: 119. 1906.

A shrub or small tree 4-8 meters high, the young branches brown, glabrous; leaves simple, usually crowded at the end of slender branches, ovate-lanceolate, thin, acute, 4-6 cm. long, the margins slightly crenate; peduncle slender, longer than the leaves, 1-3-flowered, recurved or hanging when in fruit; drupes obovoid, 6 mm. long, glabrous.

TYPE LOCALITY: San José del Cabo, Lower California.

DISTRIBUTION: Southern part of Lower California.

8. *Elaphrium glaucum* (Griseb.) Rose.*Bursera glauca* Griseb. Cat. Pl. Cub. 66. 1866.*Terebinthus glauca* Britton, Bull. Torrey Club 35: 342. 1908.

A tree 10 meters high, with a trunk 3 dm. in diameter, with peeling bark; branches reddish, slender; leaflets 1-3, glaucous, oblong to oblong-lanceolate, 2.5-5 cm. long, rounded at base, acute, entire, thickish; inflorescence short, few-flowered; calyx-lobes triangular, acute; petals lanceolate, 4 times as long as the calyx; drupes smooth, 6-7 mm. long.

TYPE LOCALITY: Eastern Cuba.

DISTRIBUTION: Cuba.

9. *Elaphrium Schaffneri* (S. Wats.) Rose.*Bursera Schaffneri* S. Wats. Proc. Am. Acad. 22: 469. 1887.*Terebinthus Schaffneri* Rose, Contr. U. S. Nat. Herb. 10: 122. 1906.

Probably a tree, with stout rigid branches; leaves pinnate, glabrous and somewhat glaucous; rachis of the leaf not winged; leaflets 3-7, obovate, obtuse, cuneate at base, entire, 6-10 mm. long; drupes triangular, obovate, acutish, 6-8 mm. long, solitary or clustered at the ends of the branches, on reflexed peduncles 2-4 mm. long.

TYPE LOCALITY: In the Morales mountains, San Luis Potosi.

DISTRIBUTION: San Luis Potosi.

10. *Elaphrium obovatum* (Turcz.) Rose.*Bursera obovata* Turcz. Bull. Soc. Nat. Mosc. 36<sup>1</sup>: 614. 1863.

Probably a shrub, glabrous; leaflets 5, shortly petiolulate, shining, obtuse or retuse, the lower ones smaller; inflorescence compact; drupes 3-celled, but one or two cells abortive.

TYPE LOCALITY: Orizaba, Vera Cruz.

DISTRIBUTION: Eastern central Mexico.

11. *Elaphrium angustatum* (Griseb.) Rose.*Bursera angustata* Griseb. Cat. Pl. Cub. 65. 1866.*Terebinthus angustata* Britton, Bull. Torrey Club 35: 342. 1908.

A small tree, 4 meters high, with reddish bark; branches reddish, glabrous; leaflets 5-11, lanceolate, narrowed at base, acute, 3-5 cm. long, glabrous, entire, with more prominent nerves beneath; inflorescence 1 dm. long; pedicels 2-3 mm. long; drupes 6 mm. long.

TYPE LOCALITY: Eastern Cuba.

DISTRIBUTION: Cuba.

12. *Elaphrium inaguense* (Britton) Rose.*Bursera inaguensis* Britton, Bull. N. Y. Bot. Gard. 3: 443. 1905.*Terebinthus inaguensis* Britton, Bull. Torrey Club 35: 342. 1908.

A shrub or small tree, 3 meters or more high; branches smooth, gray, glabrous; leaflets 3-7, oblong to oblanceolate, entire, 6 cm. long, acute or obtuse, narrow at base, light-green, indistinctly veined, thin, somewhat shining above; inflorescence often as long as the leaves; peduncles slender, 1-6 cm. long; pedicels 2-3 mm. long; calyx-lobes acute; petals oblong-lanceolate, acute; drupes 6-8 mm. long.

TYPE LOCALITY: Moujean Harbor, Little Inagua, Bahama Islands.

DISTRIBUTION: Bahama Islands and perhaps Cuba.

13. *Elaphrium cinereum* (Engler) Rose.*Bursera cinerea* Engler, in DC. Monog. Phan. 4: 43. 1883.*Terebinthus cinerea* Rose, Contr. U. S. Nat. Herb. 10: 119. 1906.

Branches when young densely whitish-tomentose, in age reddish, glabrous; leaves pinnate; leaflets 3-5, membranaceous, densely pubescent beneath, oblong-ovate, long-acuminate, 4-5 cm. long; calyx-lobes ovate, acute, glabrous; petals oblong-ovate, 3 mm. long, three times as long as the calyx-lobes.

TYPE LOCALITY: Valley of Cordoba, Vera Cruz.

DISTRIBUTION: Vera Cruz and Morelos.

14. *Elaphrium occidentale* Rose, sp. nov.

A large tree; young branches grayish, softly pubescent; leaves pinnate; leaflets 5-7, broadly ovate to shortly oblong, abruptly or shortly acuminate, 6-8 cm. long, softly pubescent on both surfaces, sometimes quite sessile; inflorescence a narrow elongate panicle, in fruit sometimes reduced to a simple raceme, softly pubescent; calyx-lobes pubescent; ovary and fruit pubescent; drupes globose, 6 mm. in diameter; stone flattened dorsally, faintly 3-angled.

Type collected between Rosario and Concepcion, Sinaloa, July 27, 1897, *J. N. Rose 3259d* (U. S. Nat. Herb. no. 302232).

15. *Elaphrium grandifolium* Schlecht. *Linnaea* 17: 249. 1843.

*Bursera grandifolia* Engler, in DC. Monog. Phan. 4: 45. 1883.

*Terebinthus grandifolia* Rose, Contr. U. S. Nat. Herb. 10: 119. 1906.

Young branches pubescent; leaves large for the genus; leaflets 5, ovate to obovate, shortly acuminate, 5-7 cm. long, entire, glabrous above, pubescent beneath; drupes 12 mm. long, obovoid, somewhat 3-angled, a little pilose.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Probably eastern Mexico.

16. *Elaphrium Simaruba* (L.) Rose.

*Pistacia Simaruba* L. Sp. Pl. 1026. 1753.

*Terebinthus Brownii* Jacq. Enum. Pl. Carib. 18. 1760.

*Bursera gummifera* L. Sp. Pl. ed. 2. 471. 1762.

*Bursera Simaruba* Sargent, Garden & Forest 3: 260. 1890.

*Terebinthus Simaruba* W. F. Wight; Rose, Contr. U. S. Nat. Herb. 10: 122. 1906.

A large tree 20 meters or less high, with a trunk sometimes 1 meter in diameter, the branches even when quite young generally glabrous, but sometimes pubescent; leaves pinnate, 1-2 dm. long; leaflets 3-7, oval to elliptic, acute or even acuminate, in age thickish; racemes pubescent or glabrous; drupes 3-angled, oblong, glabrous.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: Southern Florida, West Indies, and probably eastern and central Mexico.

ILLUSTRATIONS: Lam. Tab. Encyc. pl. 256; Descourt. Fl. Ant. pl. 97; Nutt. N. Am. Sylva pl. 79; Sargent, Silva N. Am. pl. 41, 42; Sargent, Man. f. 486; Britton, N. Am. Trees f. 545.

A very variable species as to pubescence.

17. *Elaphrium Hollickii* (Britton) Rose.

*Terebinthus Hollickii* Britton, Bull. Torrey Club 35: 341. 1908.

A small tree, 6 meters high, the trunk 2.5 dm. in diameter with a close reddish bark not peeling off in thin layers; young branches pubescent; leaflets 3-7, thickish, glabrous, entire, ovate, abruptly rounded at base, shortly acuminate; inflorescence a simple or slightly compound raceme, 4-7 cm. long; fruiting pedicels 4-5 mm. long.

TYPE LOCALITY: Port Henderson, Jamaica.

DISTRIBUTION: Jamaica.

18. *Elaphrium ovalifolium* Schlecht. *Linnaea* 17: 248. 1843.

*Bursera ovalifolia* Engler, in DC. Monog. Phan. 4: 40. 1883.

*Terebinthus ovalifolia* Rose, Contr. U. S. Nat. Herb. 10: 121. 1906.

Branches glabrous; leaves pinnate; leaflets 3-5, oblong to lanceolate, acuminate, entire, the lateral nerves prominent below, 4-5 cm. long, 2-3 cm. broad; flowers and fruit unknown.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Known only from the type specimen.

19. *Elaphrium longipes* Rose.

*Terebinthus longipes* Rose, Contr. U. S. Nat. Herb. 10: 120. 1906.

A small tree, 3-4 meters high, with a smooth trunk and with a broad flat top, glabrous throughout; leaves pinnate, 10-25 cm. long; common petiole terete, not at all winged between the leaflets; leaflets 3-6 pairs, on slender petiolules (the longer 10 mm. long), long-acuminate, the terminal ones cuneate at base, the others usually rounded, sometimes narrowed, always more or less oblique at base, green above, paler and somewhat reticulate

beneath, quite glabrous on both sides even when quite young; inflorescence paniculate, 10 cm. long; flowering pedicels 4–5 mm. long, in fruit 5–8 mm. long; calyx-lobes ovate, obtuse; petals white, oblong, 3 mm. long; drupes oblong, 12 mm. long, borne in a dense cluster.

TYPE LOCALITY: Matamoras, Puebla.

DISTRIBUTION: Hot valleys and hills of Puebla and Morelos.

#### 20. *Elaphrium attenuatum* Rose.

*Terebinthus attenuata* Rose, Contr. U. S. Nat. Herb. 12: 278. 1909.

A tree; branches even when quite young perfectly glabrous; leaves large, pinnate; leaflets 5–7, lanceolate, long-attenuate, rounded at base, 8–12 cm. long, rather thin (at least on flowering specimens), perfectly glabrous on both surfaces except for some tufts of hairs in the lower axils of the veins on the under surface; racemes slender, clustered at the ends of the second-year branches, 10–15 cm. long, glabrous; immature drupes glabrous.

TYPE LOCALITY: Colomas, Sinaloa.

DISTRIBUTION: Foothills of Sinaloa.

#### 21. *Elaphrium acuminatum* Rose.

*Terebinthus acuminata* Rose, Contr. U. S. Nat. Herb. 12: 278. 1909.

A small shrub, 3–4 meters high, the trunk and older branches shedding the bark and becoming reddish-brown; leaves large, pinnate; rachis of leaf terete, pubescent; leaflets 5–7, broadly lanceolate, acuminate, 6–10 cm. long, glabrous or nearly so above, somewhat pubescent beneath especially on the veins; drupes in rather dense racemes, short-oblong, glabrous.

TYPE LOCALITY: Near Chapala, Jalisco.

DISTRIBUTION: Dry hills of Jalisco and Michoacan.

#### 22. *Elaphrium subpubescens* Rose.

*Bursera gummifera pubescens* Engler, in DC. Monog. Phan. 4: 40. 1883. Not *Elaphrium pubescens* Schlecht. 1842.

Probably a large tree; leaves pinnate; leaflets 5, lanceolate, acuminate, glabrous above, pubescent on the veins beneath, 5–6 cm. long; flowers not seen; drupes globose or somewhat 3-angled, glabrous.

TYPE LOCALITY: Orizaba, Vera Cruz.

DISTRIBUTION: Vera Cruz, in the neighborhood of Orizaba.

#### 23. *Elaphrium heterophyllum* (Engler) Rose.

*Bursera heterophylla* Engler, in DC. Monog. Phan. 4: 46. 1883.

*Terebinthus heterophylla* Rose, Contr. U. S. Nat. Herb. 10: 119. 1906.

Young branches reddish-pubescent, in age glabrous; leaflets 3–5, subcoriaceous, beneath densely tomentose, above reddish-pilose, elliptic, entire; flowers subsessile; calyx-lobes linear, obtuse, 3 mm. long; petals oblong; fruit not known.

TYPE LOCALITY: Haquiltenango, Vera Cruz (?).

DISTRIBUTION: Known only from the type locality.

#### 24. *Elaphrium arboreum* Rose.

*Terebinthus arborea* Rose, Contr. U. S. Nat. Herb. 10: 118. 1906.

A tall tree; old trunks red and smooth; young branches pubescent; leaflets 2–4 pairs, 4–9 cm. long, ovate, rounded or cuneate or rarely cordate at base, more or less abruptly acuminate, the tip obtuse, somewhat pubescent on both sides; inflorescence paniculate; fruit glabrous; calyx-lobes ovate, acute, ciliate; drupes in very compact clusters.

TYPE LOCALITY: Between Acaponeta and Concepcion, Tepic.

DISTRIBUTION: Common along the coastal plain of southern Sinaloa and Tepic.

#### 25. *Elaphrium Kerberi* (Engler) Rose.

*Bursera Kerberi* Engler, in DC. Monog. Phan. 4: 41. 1883.

*Terebinthus Kerberi* Rose, Contr. U. S. Nat. Herb. 10: 119. 1906.

A shrub; branches glabrous; leaves clustered at the top of stunted branches; leaflets always 3, glabrous, lanceolate, long-acuminate, 4–8 cm. long, sharply serrate; inflorescence

few-flowered; peduncle short or wanting; fruiting pedicels 4–10 mm. long; drupes 6–7 mm. long.

TYPE LOCALITY: Colima.

DISTRIBUTION: Hot valleys and barrancas of Jalisco and Colima.

26. **Elaphrium lancifolium** Schlecht. *Linnaea* 17: 247. 1843.

*Bursera lancifolia* Engler, in DC. Monog. Phan. 4: 42. 1883.

*Terebinthus lancifolia* W. F. Wight; Rose, Contr. U. S. Nat. Herb. 10: 120. 1906.

Young branches glabrous; leaves glabrous, long-petiolate, pinnate; rachis not winged; leaflets 3–7, sessile, lanceolate, acuminate, cuneate at base, crenate, 2.5–7.5 cm. long; racemes short, simple, few-flowered; drupes 7–8 mm. long, glabrous.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Probably Vera Cruz.

27. **Elaphrium trijugum** (Ramirez) Rose.

*Bursera trijuga* Ramirez, Anal. Inst. Med. Nac. 2: 16. 1896.

*Terebinthus trijuga* Rose, Contr. U. S. Nat. Herb. 12: 279. 1909.

A shrub or tree; leaves clustered at the ends of short branches, pinnate; rachis not winged; leaflets 7, oblong to lanceolate, serrate, 4–5 cm. long, 8–10 mm. broad; flowers one or few; drupes oblong, 8 mm. long.

TYPE LOCALITY: District of Ayala, Morelos.

DISTRIBUTION: State of Morelos.

ILLUSTRATION: Anal. Inst. Med. Nac. 2: pl. 2.

28. **Elaphrium multijugum** (Engler) Rose.

*Bursera multijuga* Engler, in DC. Monog. Phan. 4: 42. 1883.

*Terebinthus multijuga* Rose, Contr. U. S. Nat. Herb. 10: 121. 1906.

Leaves clustered at the tops of the branches, glabrous; leaflets 11–35, 2–4 cm. long, elongate-lanceolate, somewhat serrate; panicle 5–6 times shorter than the leaves; calyx-lobes 1.5 mm. long; petals 5 mm. long.

TYPE LOCALITY: Colima.

DISTRIBUTION: Known only from the type material.

29. **Elaphrium Karwinskii** (Engler) Rose.

*Bursera Karwinskii* Engler, in DC. Monog. Phan. 4: 43. 1883.

*Terebinthus Karwinskii* Rose, Contr. U. S. Nat. Herb. 10: 119. 1906.

Leaves clustered at the tops of the branches, glabrous; leaflets 25–31, 1–1.5 cm. long, membranaceous, ovate to elliptic, crenate-serrate; flowers and fruit not known.

TYPE LOCALITY: Toliman, Queretaro.

DISTRIBUTION: Known only from the type locality.

30. **Elaphrium diversifolium** Rose.

*Bursera diversifolia* Rose, Contr. U. S. Nat. Herb. 5: 113. 1897.

*Terebinthus diversifolia* Rose, Contr. U. S. Nat. Herb. 10: 279. 1909.

A tree 3.6–7.5 m. high; older branches glabrous, shining, reddish; younger branches, rachis of leaves, and inflorescence pubescent; leaflets 4–6 pairs, the lower ones often again pinnate with 3–7 leaflets; leaflets 25 mm. long or less, ovate or oblong, serrate, obtuse, rarely acute, rounded at base, or the terminal one sometimes cuneate, pubescent and somewhat shining above, paler, softly pubescent, and reticulate beneath; rachis narrowly winged between the leaflets; inflorescence contracted; drupes glabrous, 10 mm. long.

TYPE LOCALITY: Along road from Ocuilapa to Tuxtla, Chiapas.

DISTRIBUTION: Chiapas.

31. **Elaphrium collinum** (Brand.) Rose.

*Bursera collina* Brand. Zoe 5: 204. 1905.

Habit unknown; branches glabrous; leaves bipinnate, 7–15 cm. long; rachis of leaves narrowly winged, pubescent; leaflets 5–7, ovate, acuminate, cuneate at base, 1–2.5 cm. long, 4–7 mm. wide, crenately serrate, slightly pubescent; peduncles 2–6 cm. long; drupes glabrous, 10 mm. long.

TYPE LOCALITY: Cofradia, Sinaloa.

DISTRIBUTION: Known only from the type locality.



32. *Elaphrium bipinnatum* (DC.) Schlecht. *Linnaea* 17: 631. 1843.

*Amyris bipinnata* DC. *Prodr.* 2: 82. 1825.

*Bursera bipinnata* Engler, in DC. *Monog. Phan.* 4: 49. 1883.

*Terebinthus bipinnata* W. F. Wight; Rose, *Contr. U. S. Nat. Herb.* 10: 119. 1906.

A shrub; leaves bipinnate; rachis winged; leaflets small, ovate, shining and glabrous above, duller and nearly or quite glabrous beneath; inflorescence shorter than the leaves, few-flowered; calyx-lobes linear, as long as or longer than the petals; drupes globose, glabrous.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Tropical valleys, Sinaloa to Guerrero and Morelos.

ILLUSTRATION: Moc. & Sessé, Calq. Dess. *pl.* 197.

33. *Elaphrium gracile* (Engler) Rose.

*Bursera gracilis* Engler, in DC. *Monog. Phan.* 4: 50. 1883.

*Terebinthus gracilis* Rose, *Contr. U. S. Nat. Herb.* 10: 119. 1906.

Young branches somewhat pubescent; leaves clustered at the ends of stunted branches, or, on vigorous shoots, alternate; leaves narrow in outline, pinnate or the lower lobes again pinnate; leaflets small, shining and somewhat hairy above, hairy and somewhat reticulate beneath; inflorescence rather compact, shorter than the leaves, hairy; calyx-lobes ovate, shorter than the petals; drupes glabrous, smooth.

TYPE LOCALITY: Xochiculco, Oaxaca.

DISTRIBUTION: Common in barrancas and on dry hills of Oaxaca.

34. *Elaphrium aridum* Rose.

*Terebinthus arida* Rose, *Contr. U. S. Nat. Herb.* 10: 118. 1906.

A low shrub; branches dark-gray, those of the first year densely pubescent, the older ones glabrous; leaves clustered near the ends of short spurs or scattered along the new branches; leaflets mostly 2-4 pairs, rarely reduced to 3 or sometimes even to one, oblong to spatulate, 4-6 cm. long, obtuse, glabrous on both sides; petiole and the narrowly winged rachis slightly hairy; flowers sessile; calyx-lobes half as long as the petals, both hairy; drupes sessile, glabrous.

TYPE LOCALITY: Tehuacan, Puebla.

DISTRIBUTION: On the very dry hills about Tehuacan.

ILLUSTRATION: *Contr. U. S. Nat. Herb.* 10: *pl.* 36.

35. *Elaphrium Galeottianum* (Engler) Rose.

*Bursera Galeottiana* Engler, in DC. *Monog. Phan.* 4: 47. 1883.

*Terebinthus Galeottiana* Rose, *Contr. U. S. Nat. Herb.* 10: 119. 1906.

A small tree; young branches softly pubescent; leaves simply pinnate, their petioles pubescent, narrowly winged; leaflets 13-25, linear, glabrous, entire; fruit usually on short recurved pedicels, often forming a cluster at the top of the second-year growth; drupes obovoid, pointed, glabrous.

TYPE LOCALITY: Tehuacan, Puebla.

DISTRIBUTION: Oaxaca and Puebla.

36. *Elaphrium apterum* (Ramirez) Rose.

*Bursera aptera* Ramirez, *Anal. Inst. Med. Nac.* 2: 16. 1896.

*Terebinthus aptera* Rose, *Contr. U. S. Nat. Herb.* 10: 118. 1906.

A small tree; young branches glabrous, reddish; old branches blackish; leaves clustered at the ends of short, stunted branches, once-pinnate; rachis narrowly winged; leaflets 7-11, ovate, obtuse, entire or rarely somewhat crenate, 8-15 mm. long, glabrous; peduncles one-flowered, very short, 2-3 mm. long; drupes glabrous, 5 mm. in diameter.

TYPE LOCALITY: Jojutla, Morelos.

DISTRIBUTION: State of Morelos.

ILLUSTRATION: *Anal. Inst. Med. Nac.* 2: *pl.* 1.

37. *Elaphrium Purpusii* (Brand.) Rose.

*Bursera Purpusii* Brand. *Zoe* 5: 249. 1908.

A small shrub; branches gray, glabrous; leaves pinnate; rachis not winged; leaflets

5-7, 2-3 cm. long, narrowly ovate to spatulate, obtuse, cuneate at base, entire; flowers not seen; drupes solitary, globose, on deflexed peduncles 2 mm. long.

TYPE LOCALITY: Zacuapan, Vera Cruz.

DISTRIBUTION: Vera Cruz.

### 38. *Elaphrium Covillei* Rose, sp. nov.

A small tree, 4-6 meters high with a trunk 10-20 cm. in diameter; branches slender, reddish, glabrous, somewhat glaucous; leaves alternate, pinnate; rachis slightly winged; leaflets 7-11, lanceolate to oblong, 10-18 mm. long, glabrous, entire, obtuse, the terminal one often wanting; flowers solitary, rarely in pairs; peduncles 3-8 mm. long; drupes globose or somewhat 3-angled, pointed, black, somewhat glaucous, glabrous, 7-9 mm. long, usually nodding or hanging.

Type collected about 6 miles west of Torres, Sonora, February 7, 1903, *F. V. Coville 1940* (U. S. Nat. Herb. no. 398060).

Near *E. microphyllum*, but with broader leaflets and duller-colored branches.

### 39. *Elaphrium odoratum* (Brand.) Rose.

*Bursera odorata* Brand. Proc. Calif. Acad. II. 2: 138. 1889.

*Terebinthus odorata* Rose, Contr. U. S. Nat. Herb. 10: 121. 1906.

A shrub or small tree, 2-4 meters high, the trunk 5-8 cm. in diameter, the inner bark thin and yellowish; young branches glabrous, pale-red, the old ones dark; leaves pinnate; rachis very narrowly winged; leaflets usually 7, oblong-ovate, acute, entire, glabrous, 12-14 mm. long; inflorescence of 1-3 flowers; pedicels short, recurved in fruit; drupes globose, glabrous.

TYPE LOCALITY: San Gregorio, Lower California.

DISTRIBUTION: Lower California.

### 40. *Elaphrium microphyllum* (A. Gray) Rose.

*Bursera microphylla* A. Gray, Proc. Am. Acad. 5: 155. 1861.

*Terebinthus microphylla* Rose, Contr. U. S. Nat. Herb. 10: 120. 1906.

A small tree; young branches glabrous; old branches cherry-red; leaves once-pinnate; rachis narrowly winged; leaflets 7-33, oblong-linear, obtuse, sessile, 6-8 mm. long, glabrous; inflorescence appearing before the leaves, 1-2 cm. long, glabrous, 1-3-flowered (as many as 4 flowers have been reported); pedicels slender, 3-4 mm. long; calyx-lobes ovate, 1 mm. long; petals 5, 4 mm. long; stamens 10, shorter than the petals; drupes glabrous, usually solitary, 3-angled, hanging; exocarp splitting into 3 valves; stone sharply 3-angled, yellow, 6 mm. long, with a circular deep depression at base in the mesocarp.

TYPE LOCALITY: Sierra Tulé, Sonora.

DISTRIBUTION: Southern Arizona, Sonora, and Lower California.

### 41. *Elaphrium morelense* (Ramirez) Rose.

*Bursera morelensis* Ramirez, Anal. Inst. Med. Nac. 2: 17. 1896.

*Terebinthus morelensis* Rose, Contr. U. S. Nat. Herb. 10: 120. 1906.

A small tree, with branches, foliage, and inflorescence glabrous from the first; leaves once-pinnate, the rachis only slightly winged; leaflets 15-35, linear-oblong, acute, 8-12 mm. long, glabrous, entire, not at all reticulately veined; peduncles one-flowered, perhaps sometimes several-flowered, 8-15 mm. long, nodding when in fruit; drupes globose, 6-8 mm. long.

TYPE LOCALITY: District of Ayala, Morelos.

DISTRIBUTION: Morelos to Oaxaca (?).

ILLUSTRATION: Anal. Inst. Med. Nac. 2: pl. 3.

### 42. *Elaphrium multifolium* Rose.

*Terebinthus multifolia* Rose, Contr. U. S. Nat. Herb. 10: 120. 1906.

A small shrub 2.4 meters high; branches dark, sometimes reddish, glabrous; very young branches puberulent; leaves borne in clusters near the ends of short branches, once-pinnate; leaflets 15-19, linear-oblong, 10-13 mm. long, 2-3 mm. broad, glabrous, entire, obtuse; drupes solitary on short reflexed peduncles, globose, glabrous, 6 mm. long.

TYPE LOCALITY: San Juan Capistrano, Zacatecas.

DISTRIBUTION: In valleys of Zacatecas.

43. *Elaphrium glabrifolium* H.B.K. Nov. Gen. & Sp. 7: 28. 1824.

A tree; young branches tomentose; leaves clustered at the ends of the branches, once-pinnate; rachis winged, subdentate; leaflets 7-9, obtuse, glabrous on both sides, shining above, reticulately veined beneath, strongly crenate; drupes globose, the size of a pea.

TYPE LOCALITY: Near Ario, between Patzcuaro and Jorullo, Michoacan.

DISTRIBUTION: Known only from the type locality.

44. *Elaphrium fagaroides* H.B.K. Nov. Gen. & Sp. 7: 27. 1824.

*Amyris fagaroides* Spreng. Syst. 4: Cur. Post. 148. 1827.

*Bursera fagaroides* Engler, in DC. Monog. Phan. 4: 48. 1883.

*Terebinthus fagaroides* W. F. Wight; Rose, Contr. U. S. Nat. Herb. 10: 119. 1906.

A tree, very much branched; branches grayish or brownish; leaves pinnate; rachis hardly if at all winged; leaflets 5-7, glabrous, obtuse, cuneate at base, crenate, small; flowers borne in dense clusters on short stunted branches; drupes few, borne on short peduncles, globose, smooth.

TYPE LOCALITY: Queretaro, Queretaro.

DISTRIBUTION: Central Mexico.

ILLUSTRATION: H.B.K. Nov. Gen. & Sp. 7: pl. 611.

45. *Elaphrium Nelsoni* Rose.

*Bursera Nelsoni* Rose, Contr. U. S. Nat. Herb. 3: 314. 1895.

*Terebinthus Nelsoni* Rose, Contr. U. S. Nat. Herb. 12: 279. 1909.

A shrub or tree; branches dark-brown to nearly black; leaves pinnate; leaflets 5-9, oblong to ovate, 8-16 mm. long, obtuse, rounded at base, the terminal one cuneate, crenately toothed above the middle, glabrous and shining above, strongly reticulate and nearly glabrous beneath; rachis 3.6-5 cm. long, silky-pubescent especially below, narrowly winged between the leaflets; flowers in short drooping panicles 2-3 cm. long; pedicels 2-3 mm. long, hairy; calyx-lobes small; petals 3 mm. long, hairy; drupes solitary on long slender peduncles, 16 mm. long, or sometimes geminate on shorter pedicels, obovate, obtuse, 8 mm. long, the exocarp glabrous, splitting into two valves; stone globular, light-colored.

TYPE LOCALITY: Atlixco, Puebla.

DISTRIBUTION: Puebla.

46. *Elaphrium pubescens* Schlecht. Linnaea 16: 527. 1842.

*Terebinthus pubescens* Rose, Contr. U. S. Nat. Herb. 12: 279. 1909.

Rachis of leaf winged; leaflets 7, 3-5 cm. long, narrowly elliptic, acute and acuminate, cuneate at base, entire below, coarsely and irregularly toothed above, pubescent on both sides; inflorescence as long as the leaves; calyx-lobes 4, very short, ciliate; petals 4, elliptic, obtuse, somewhat narrowed at base, glabrous.

TYPE LOCALITY: Campeche.

DISTRIBUTION: Probably common in Campeche and Yucatan.

47. *Elaphrium pilosum* (Engler) Rose.

*Bursera graveolens pilosa* Engler, in DC. Monog. Phan. 4: 49. 1883.

*Terebinthus pilosa* Rose, Contr. U. S. Nat. Herb. 12: 279. 1909.

A small tree; young branches nearly or quite glabrous; leaves pinnate, usually clustered with the inflorescence at the ends of short branches; rachis more or less winged; leaflets 7-15, lanceolate, acuminate, 4-8 cm. long, glabrous on both surfaces, or sometimes pilose on the under surface along the midrib, the margin strongly toothed; inflorescence an open panicle; calyx-lobes narrowly ovate, acute, hairy; petals twice as long as the sepals, hairy; ovary and fruit glabrous, the latter 10-12 mm. long.

TYPE LOCALITY: Colima.

DISTRIBUTION: Southern Chihuahua and Sinaloa to Colima.

This species has heretofore been confused with *E. graveolens* H.B.K., a South American species, but is much less pubescent and has differently toothed leaves and different sepals.

48. *Elaphrium confusum* Rose, sp. nov.

A small tree, glabrous throughout; branches pale, the bark readily peeling off; leaves clustered at the ends of short branches; rachis narrow, slightly winged; leaflets 5-9, nar-

rowly lanceolate, 1.5–2.5 cm. long, acute; flowers borne in numerous clusters, appearing with the young leaves; calyx-lobes ovate, 1 mm. long; petals 3.5–4 mm. long; drupes more or less wrinkled, 5–6 mm. long; stone often nearly globose.

Type collected near Tapotla, Jalisco, May 27, 1893, *C. G. Pringle* 4372 (U. S. Nat. Herb. no. 200701).

#### 49. *Elaphrium tenuifolium* Rose.

*Bursera tenuifolia* Rose, Contr. U. S. Nat. Herb. 3: 314. 1895.

*Terebinthus tenuifolia* Rose, Contr. U. S. Nat. Herb. 10: 122. 1906.

A small tree, 7.5 meters high, glabrous throughout; leaves often clustered at the ends of short, stunted branches; leaflets 7–15, narrowly lanceolate, acute, cuneate at base, 1.2–3.6 cm. long, entire or slightly crenate; rachis 12–50 mm. long, slightly winged; flower clusters 1–3-flowered, several in the axils of the leaves; peduncle and pedicels very short; drupes 6 mm. long, 3-valved.

TYPE LOCALITY: Lodiago, Sinaloa.

DISTRIBUTION: Known only from the type locality.

#### 50. *Elaphrium fragile* (S. Wats.) Rose.

*Bursera fragilis* S. Wats. Proc. Am. Acad. 21: 422. 1886.

*Terebinthus fragilis* Rose, Contr. U. S. Nat. Herb. 10: 119. 1906.

A small tree, 3–5 meters high, the trunk 5–8 cm. in diameter, glabrous throughout; leaves pinnate; rachis narrowly winged; leaflets 3–5, lanceolate, acuminate, cuneate at base, crenate-serrate, 2–6 cm. long; peduncles 1–3-flowered; petals 6–12 mm. long; drupes obovoid, 6–10 mm. long.

TYPE LOCALITY: Hacienda San Miguel, near Batopilas, Chihuahua.

DISTRIBUTION: Hot valleys of southern Chihuahua.

#### 51. *Elaphrium rubrum* Rose.

*Terebinthus rubra* Rose, Contr. U. S. Nat. Herb. 10: 121. 1906.

A small tree or shrub with a smooth red trunk, the bark peeling off in broad sheets; young branches and leaves glabrous; leaflets 5–7 pairs, lanceolate, rounded at base, acuminate, serrate below, entire above, paler beneath, 4 cm. long or less; flowers not seen, but inflorescence apparently open; fruiting peduncle 1–2 cm. long, bearing 2–4 fruits; drupes obovate, somewhat 3-angled.

TYPE LOCALITY: Near Colomas, Sinaloa.

DISTRIBUTION: Foothills of Sinaloa.

#### 52. *Elaphrium Pringlei* (S. Wats.) Rose.

*Bursera Pringlei* S. Wats. Proc. Am. Acad. 25: 145. 1890.

*Terebinthus Pringlei* Rose, Contr. U. S. Nat. Herb. 10: 121. 1906.

A small tree, glabrous throughout; bark of trunk red, easily peeling off in thin sheets; branches dark-brown; leaves once-pinnate, 5–15 cm. long; rachis narrowly winged; leaflets 25, linear-lanceolate, acuminate, 2–4 cm. long, serrate, thinnish, not at all rugose; raceme short, few-flowered; pedicels 6–10 mm. long; calyx-lobes ovate, 1 mm. long; petals 4 mm. long, glabrous; drupes globose, 4–6 mm. in diameter.

TYPE LOCALITY: Rocky bluff of the Rio Grande de Santiago near Guadalajara, Jalisco.

DISTRIBUTION: Hot barrancas of Jalisco.

#### 53. *Elaphrium bicolor* Schlecht. *Linnaea* 17: 625. 1843.

*Bursera bicolor* Engler, in DC. Monog. Phan. 4: 53. 1883.

*Terebinthus bicolor* Rose, Contr. U. S. Nat. Herb. 10: 118. 1906.

A small tree with rounded top; young branches reddish, glabrous; leaves pinnate; rachis narrowly winged; leaflets 9–19, linear to narrowly lanceolate, acuminate, above dark-green, glabrous or nearly so, beneath with a white matted tomentum, the margin subentire, revolute; inflorescence a narrow panicle 10–20 cm. long, more or less glandular; calyx-lobes triangular-ovate, 4 mm. long, glandular and pubescent; petals purplish, 5–6 mm. long, long-pilose; ovary oblong, acuminate, glandular; drupes 10–15 mm. long.

TYPE LOCALITY: Real de Huautla [Cuantla], Morelos.

DISTRIBUTION: Vera Cruz (?) to Morelos.

54. *Elaphrium biflorum* Rose.

*Terebinthus biflora* Rose, Contr. U. S. Nat. Herb. 10: 119. 1906.

A tree, 2-5 meters high with many stunted branches; leaves on very short petioles (8 mm. long); leaflets always 3, small, 6-20 mm. long, ovate to obovate, acute or obtuse, more or less cuneate at base, crenate, slightly pubescent on both sides; fruiting peduncles slender, 12-20 mm. long; pedicels 4 mm. long; drupes usually in pairs, 8 mm. long, glabrous.

TYPE LOCALITY: Near Tehuacan, Puebla.  
DISTRIBUTION: Puebla.

55. *Elaphrium mexicanum* (Engler) Rose.

*Bursera mexicana* Engler, in DC. Monog. Phan. 4: 51. 1883.  
*Terebinthus mexicana* W. F. Wight; Rose, Contr. U. S. Nat. Herb. 10: 120. 1906.

Probably a tree; leaves clustered at the ends of the branches, pinnate; leaflets 11-13, elliptic to oblong-elliptic, 2-2.5 cm. long, 6-10 mm. broad, thin, membranaceous, serrate, in age glabrous, shining above; inflorescence paniculate, 6-8 cm. long; calyx-lobes linear-lanceolate, acute, 2 mm. long; petals linear-lanceolate, acute, 4 mm. long; ovary and fruit glabrous, the latter 7 mm. long.

TYPE LOCALITY: San Luis [Potosi].  
DISTRIBUTION: From San Luis Potosi to Vera Cruz and west to Colima.

56. *Elaphrium brachypodum* Rose, sp. nov.

A shrub or small tree; bark of trunk peeling off in large thin yellow sheets; young branches pubescent; leaves clustered at the ends of short branches or more or less scattered; rachis of leaf narrowly winged, pubescent; leaflets 9-13, lanceolate, 1-3 cm. long, obtuse or acute, serrate, slightly pubescent on both surfaces; flowers not seen; drupes solitary, borne on stout peduncles 2-3 mm. long, globose, glabrous, black, 5 mm. in diameter.

Type collected near Etzatlan, Jalisco, October 2, 1903, *J. N. Rose & Joseph H. Painter 7534* (U. S. Nat. Herb. no. 451142).

57. *Elaphrium penicillatum* DC. Prodr. 1: 724. 1824.

*Amyris penicillata* Spreng. Syst. 2: 219. 1825.  
*Bursera penicillata* Engler, in DC. Monog. Phan. 4: 52. 1883.  
*Terebinthus penicillata* Rose, Contr. U. S. Nat. Herb. 10: 121. 1906.

Probably a tree; leaves pinnate; rachis winged; leaflets 7-9, oval-oblong, acuminate, strongly toothed, subglabrous; inflorescence shorter than the leaves; fruit unknown.

TYPE LOCALITY: Mexico.  
DISTRIBUTION: Mexico.  
ILLUSTRATION: Moc. & Sessé, Calq. Dess. pl. 207; pl. xxx, f. C.

58. *Elaphrium Delpechianum* (Poisson) Rose.

*Bursera Delpechiana* Poisson; Engler, in DC. Monog. Phan. 4: 53. 1883.  
*Terebinthus Delpechiana* Rose, Contr. U. S. Nat. Herb. 10: 119. 1906.

Probably a tree; leaves 5-6 cm. long, clustered at the ends of the branches; rachis narrowly winged; leaflets 7, elliptic, acute at both ends, crenate-serrate, 1.5-2 cm. long, 8-10 mm. broad; panicle as long as the leaves, short-pilose; pedicels slender, 3-4 mm. long; calyx-lobes short-deltoid, 1 mm. long; petals oblong, 5 mm. long, with scanty long hairs; drupes ovoid, glabrous, about 1 cm. long.

TYPE LOCALITY: Mexico.  
DISTRIBUTION: Known only from the type collection.

59. *Elaphrium laxiflorum* (S. Wats.) Rose.

*Bursera laxiflora* S. Wats. Proc. Am. Acad. 24: 44. 1889.  
*Terebinthus laxiflora* Rose, Contr. U. S. Nat. Herb. 12: 279. 1909.

A small tree, the trunk 1.5-3 dm. in diameter; young branches, and sometimes those of the second year, pubescent; leaves pinnate; rachis narrowly winged, somewhat pubescent; leaflets 5-9, ovate to oblong, obtuse, entire or few-toothed; inflorescence 1-3-

flowered; pedicels 10-12 mm. long; calyx-lobes narrow, 2 mm. long; drupes obovoid, narrowed at base, 8 mm. long, somewhat flattened; exocarp 2-valved.

TYPE LOCALITY: Near Guaymas, Sonora.  
DISTRIBUTION: Sonora and Sinaloa.

60. **Elaphrium filicifolium** (Brand.) Rose.

*Bursera filicifolia* Brand. Zoe 5: 248. 1908.

A small tree with dull-grayish bark; first-year branches cinerous; leaves pinnate; rachis winged; leaflets 9-19, pubescent on both surfaces, nearly orbicular, obtuse, 5-10 mm. long; peduncles 1-2-flowered, 2-5 cm. long; pedicels 5-6 mm. long; petals twice as long as the calyx; drupes 10 mm. long.

TYPE LOCALITY: Rancho Colorado, Lower California.  
DISTRIBUTION: Cape Region of Lower California.

61. **Elaphrium longipedunculatum** Rose, sp. nov.

A tree; bark of second-year branches dark-brown, smooth; rachis of leaves narrowly winged, entire; leaflets 5-7, ovate to short-oblong, 1.5-4 cm. long, acute, nearly glabrous above, somewhat hairy beneath, crenate; peduncles flattened, 3-4 cm. long, bearing 2 or 3 fruits; pedicels 10-12 mm. long, somewhat enlarged above; drupes somewhat flattened, 10 mm. long, glabrous; exocarp splitting into 2 valves.

Type collected near Almoloyas, Oaxaca, September, 1906, *J. N. Rose & J. S. Rose 11282* (U. S. Nat. Herb. no. 454073).

62. **Elaphrium pannosum** (Engler) Rose.

*Bursera pannosa* Engler, in DC. Monog. Phan. 4: 54. 1883.  
*Terebinthus pannosa* Rose, Contr. U. S. Nat. Herb. 10: 121. 1906.

Probably a tree; leaves pinnate, 6 cm. long; rachis narrowly winged; leaflets 9, sessile, oblong, acute at both ends, slightly pubescent above, densely tomentose beneath, entire, or with small teeth, 1.5-2 cm. long, 6-9 mm. broad; flowers and fruit not known.

TYPE LOCALITY: Mirador, Vera Cruz.  
DISTRIBUTION: Known only from the type locality.

63. **Elaphrium asplenifolium** (Brand.) Rose.

*Bursera asplenifolia* Brand. Univ. Calif. Publ. Bot. 3: 382. 1909.

A shrub or small tree; young branches pubescent, old branches brownish, glabrate; leaves pinnate; rachis winged; leaflets 15-21, sessile, oblong-elliptic, acute, crenate, 3 cm. long; flowering branches short; pedicels 1-2 mm. long; drupes subglobose, 8 mm. in diameter.

TYPE LOCALITY: San Luis, Puebla.  
DISTRIBUTION: Near the borders of Oaxaca and Puebla.

64. **Elaphrium sessiliflorum** (Engler) Rose.

*Bursera sessiliflora* Engler, in DC. Monog. Phan. 4: 55. 1883.  
*Terebinthus sessiliflora* Rose, Contr. U. S. Nat. Herb. 10: 122. 1906.

Probably a tree; young branches grayish or reddish, tomentose; leaves pinnate; rachis winged; leaflets 15-17, oblong-elliptic to elliptic-lanceolate, 5-7.5 cm. long, crenate-serrate; flowering branches very short; flowers subsessile; drupes subglobose, 7 mm. in diameter.

TYPE LOCALITY: Mexico.  
DISTRIBUTION: Known only from the type collection.

65. **Elaphrium queretarensis** Rose, sp. nov.

A tree, 4-5 m. high; second-year branches brownish or reddish, glabrous; young branches pubescent; leaves on vigorous shoots alternate, but on short branches clustered near the tips, pinnate; rachis broadly winged; leaflets 7-9, lanceolate, 1-3 cm. long, acute, serrate, lighter-colored beneath than above, very pubescent on both surfaces; flowers not seen; fruiting clusters short and compact, densely tomentose; persisting calyx-lobes very pubescent; drupes large, 8-9 mm. long, apiculate, shining.

Type collected near Queretaro, Mexico, August, 1906, *J. N. Rose & Joseph H. Painter 11153* (U. S. Nat. Herb. no. 453938).

66. **Elaphrium submoniliforme** (Engler) L. Marchand (; Engler, in DC. Monog. Phan. 4: 55, as synonym. 1883).

*Bursera submoniliformis* Engler, in DC. Monog. Phan. 4: 55. 1883.

*Terebinthus submoniliformis* Rose, Contr. U. S. Nat. Herb. 10: 122. 1906.

Probably a tree; old branches reddish-brown, glabrous; young branches doubtless hairy; leaves 6-8 cm. long, clustered at the ends of short branches; rachis narrowly winged; leaflets 7-13, sessile, oblong, crenate-serrate, densely tomentose on both surfaces, 1-2.5 cm. long, acute; inflorescence much shorter than the leaves, many-flowered; pedicels slender, tomentose; calyx-lobes linear, obtuse, 4 mm. long; petals oblong; drupes globular, 8 mm. in diameter, pubescent.

TYPE LOCALITY: Rio Vuellas, Oaxaca.

DISTRIBUTION: Hot valleys of Oaxaca.

67. **Elaphrium Palmeri** (S. Wats.) Rose.

*Bursera Palmeri* S. Wats. Proc. Am. Acad. 22: 402. 1887.

*Terebinthus Palmeri* Rose, Contr. U. S. Nat. Herb. 10: 121. 1906.

A shrub or small tree, with smooth reddish bark; young branches densely pubescent; leaves pinnate; rachis broadly winged, toothed; leaflets 7-11, lanceolate, acute or acuminate, 2.5-5 cm. long, densely pubescent on both surfaces, but especially so beneath; peduncles short or none; pedicels 4-8 mm. long; drupes ovoid, acute, glabrous, 8 mm. long.

TYPE LOCALITY: In a deep canyon, Rio Blanco, near Guadalajara, Jalisco.

DISTRIBUTION: Durango to Guatemala.

68. **Elaphrium Aloexylon** Schiede, *Linnaea* 17: 252. 1843.

? *Amyris Linaloe* Llave, Reg. Trim. 1: 356. 2.

*Bursera Aloexylon* Engler, in DC. Monog. Phan. 4: 52. 1883.

*Terebinthus Aloexylon* W. F. Wight; Rose, Contr. U. S. Nat. Herb. 10: 118. 1906.

Young branches glabrous; leaves pinnate; rachis narrowly winged; leaflets 5-7, membranaceous, obtuse, coarsely crenate, above shortly pilose and shining, tomentose beneath, 1.5-2 cm. long; inflorescence shorter than the leaves, 3 cm. long; fruiting pedicels 1-1.5 cm. long; drupes 6-7 mm. long.

TYPE LOCALITY: Real de Huautla [Cuautla], Morelos.

DISTRIBUTION: Vera Cruz (?) to Morelos.

69. **Elaphrium rhoifolium** Benth. Bot. Voy. Sulph. 10. 1844.

*Elaphrium Hindsianum* Benth. Bot. Voy. Sulph. 11. 1844.

*Bursera Hindsiana* Engler, in DC. Monog. Phan. 4: 58. 1883.

*Bursera Hindsiana rhoifolia* Engler, in DC. Monog. Phan. 4: 59. 1883.

*Terebinthus rhoifolia* Rose, Contr. U. S. Nat. Herb. 10: 121. 1906.

A small tree; leaves simple or 3-foliolate, the blades oval to short-oblong, strongly crenate, pubescent on both surfaces; inflorescence shorter than the leaves; peduncles short, pilose; drupes 1 or 2, globular, glabrous.

TYPE LOCALITY: Near the Bay of Magdalena, Lower California.

DISTRIBUTION: Southern Lower California.

ILLUSTRATION: Benth. Bot. Voy. Sulph. pl. 7, 8.

70. **Elaphrium MacDougalii** Rose.

*Terebinthus Macdougalii* Rose, *Torreyia* 6: 170. 1906.

A small tree; bark of one- and two-year-old branches reddish, smooth; leaves clustered at the ends of short spurs, either simple or with 3-5 leaflets; rachis of compound leaves winged; petioles short; blades oblong, obtuse, 1-1.5 cm. long, crenately toothed, with a very short, dense pubescence on both surfaces; staminate flowers borne in short racemes or panicles; calyx-lobes and petals densely pubescent; pistillate flowers solitary; peduncles very short, 4 mm. long, glabrous; drupes 7 mm. long; naked part of pyrene light-colored.

TYPE LOCALITY: Probably near the mouth of the Colorado River.

DISTRIBUTION: Northern Lower California.

ILLUSTRATION: *Torreyia* 6: 170. f. 5.

71. *Elaphrium Goldmani* Rose, sp. nov.

A small tree; bark of first-year branches brownish, pubescent, of older branches grayish, glabrate; rachis of leaves winged; leaflets 5-7; blades ovate to oblong, the lateral ones rounded at base, the terminal cuneate at base, all rounded at apex, 3 cm. long or less, crenate, pubescent on both surfaces; inflorescence shorter than the leaves, few-flowered; fruiting pedicels 6-7 mm. long; drupes smooth, 7-8 mm. long.

Type collected between Malanata and La Cruz, Lower California, December 9, 1905, *E. W. Nelson & E. A. Goldman 7303* (U. S. Nat. Herb. no. 565578).

72. *Elaphrium Schiedeana* (Engler) Rose.

*Bursera Schiedeana* Engler, in DC. Monog. Phan. 4: 57. 1883.

*Terebinthus Schiedeana* Rose, Contr. U. S. Nat. Herb. 10: 122. 1906.

Probably a tree; branches short and thick; leaves clustered at the ends of branches, pinnate; rachis winged; leaflets 7-9, coriaceous, strongly reticulate beneath, sessile, ovate, obtuse, 1-1.5 cm. long, 6-8 mm. broad, more or less pubescent on both surfaces, crenate; flowering branches shorter than the leaves, 2 cm. long; flowers and fruit unknown.

TYPE LOCALITY: Near Huautla [Cuautla], Morelos.

DISTRIBUTION: Known only from the type locality.

73. *Elaphrium glabrescens* (S. Wats.) Rose.

*Bursera Palmeri glabrescens* S. Wats. Proc. Am. Acad. 25: 145. 1890.

*Bursera glabrescens* Rose, Contr. U. S. Nat. Herb. 3: 313. 1895.

*Terebinthus glabrescens* Rose, Contr. U. S. Nat. Herb. 10: 119. 1906.

A shrub or small tree, 3.6-7.5 meters high, with dark-brown or blackish bark; leaflets 5-10 pairs, small, 4 cm. long or less, rarely 12 mm. wide, oblong, very rugose and becoming nearly glabrous above, strongly reticulate and pubescent beneath; rachis with narrow wings; racemes very much contracted, but, including the peduncle, often 25-38 mm. long; drupes 6 mm. in diameter; stone orange, spheric.

TYPE LOCALITY: Bluff of the Rio Grande de Santiago near Guadalajara, Jalisco.

DISTRIBUTION: Durango to Jalisco.

74. *Elaphrium jorullense* H.B.K. Nov. Gen. & Sp. 7: 28. 1824.

*Amyris jorullensis* Spreng. Syst. 4: Cur. Post. 148. 1827.

*Bursera jorullensis* Engler, in DC. Monog. Phan. 4: 57. 1883.

*Terebinthus jorullensis* W. F. Wight; Rose, Contr. U. S. Nat. Herb. 10: 119. 1906.

A small tree; branches purplish, smooth, glabrous; leaflets oblong, obtuse, crenate, softly tomentose on both sides, strongly rugose beneath, 20-25 mm. long; inflorescence compact, 8 cm. long; drupes globose.

TYPE LOCALITY: Near Jorullo, Michoacan.

DISTRIBUTION: Central Mexico.

ILLUSTRATION: H.B.K. Nov. Gen. & Sp. pl. 612.

75. *Elaphrium lanuginosum* H.B.K. Nov. Gen. & Sp. 7: 31. 1824.

*Amyris lanuginosa* Spreng. Syst. 4: Cur. Post. 149. 1827.

*Bursera lanuginosa* Engler, in DC. Monog. Phan. 4: 58. 1883.

*Terebinthus lanuginosa* Rose, Contr. U. S. Nat. Herb. 10: 120. 1906.

A small tree, the young branches very pubescent, the old branches glabrate, with smooth brown bark; leaves clustered at the ends of short branches, once-pinnate; rachis winged, entire (sometimes toothed?); leaflets 9-19, oblong, acute, crenate, densely pubescent on both surfaces, 1.5-2.5 cm. long, sometimes reticulate beneath; inflorescence compact, 1-3 cm. long; calyx-lobes very hairy without; drupes subsessile, glabrous, globose, 5-6 mm. in diameter.

TYPE LOCALITY: Near Cuernavaca, Morelos.

DISTRIBUTION: Hot and dry valleys of central Mexico, especially in the State of Morelos.



76. *Elaphrium excelsum* H.B.K. Nov. Gen. &  
Sp. 7: 30. 1824.

*Bursera excelsa* Engler, in DC. Monog. Phan. 4: 57. 1883.

*Terebinthus excelsa* W. F. Wight; Rose, Contr. U. S. Nat. Herb. 10: 119. 1906.

A tree, with red bark; branches smooth and glabrous below, pubescent above; leaves pinnate; rachis winged, toothed; leaflets 5-9, obtuse, strongly crenate, pubescent above, tomentose beneath, the terminal ones 5 cm. long, cuneate at base; peduncle axillary, short, tomentose.

TYPE LOCALITY: Between Acapulco and El Exido, Guerrero.

DISTRIBUTION: West coast of southern Mexico.

ILLUSTRATION: H.B.K. Nov. Gen. & Sp. *pl.* 611, in part.

77. *Elaphrium cuneatum* Schlecht. Linnaea 17: 629. 1843.

*Bursera cuneata* Engler, in DC. Monog. Phan. 4: 56. 1883.

*Terebinthus cuneata* Rose, Contr. U. S. Nat. Herb. 10: 119. 1906.

Probably a tree; young branches pubescent; leaves pinnate; rachis winged; leaflets 7-9, elliptic to oblong, acute, cuneate at base, serrate, strongly nerved, somewhat pubescent above, densely pubescent beneath; fruiting racemes longer than the petioles; drupes ovoid to orbicular, acute.

TYPE LOCALITY: Near "Zamalitzlahuaca" [? Tlamixtlahuaca, Guerrero].

DISTRIBUTION: Vera Cruz (?) and Guerrero.

DOUBTFUL AND EXCLUDED SPECIES

? *Amyris Tecomaca* DC. Prodr. 2: 82. 1825. Mexico. (Moc. & Sessé, Calq. Dess. *pl.* 195.) If an *Elaphrium*, near *E. graveolens* and *E. pilosum*, but with fewer leaflets.

*Bursera pubescens* S. Wats. Proc. Am. Acad. 24: 44 (1889), is *Veatchia discolor* (Benth.) Brand.

*Elaphrium ariense* H.B.K. Nov. Gen. & Sp. 7: 31. 1824. *Amyris ariensis* Spreng. Syst. 4: Cur. Post. 149. 1827. A small tree; branches angled, softly villous; leaves pinnate; rachis slightly winged; leaflets 11-15, oblong, acute or subacuminate, obtuse at base, crenate-serrate, above pubescent, beneath somewhat canescent, 30-38 mm. long, 12 mm. broad, the lower ones smaller; inflorescence and fruit unknown. Central Mexico.

*Elaphrium copalliferum* DC. Prodr. 1: 724. 1824. *Amyris copallifera* Oliva, Naturaleza 1: 40. 1869. Probably a shrub: leaves pubescent; rachis of leaf winged; leaflets 7-13, lanceolate, acute, dentate; inflorescence compact; pedicels very short. Mexico. Moc. & Sessé, Calq. Dess. *pl.* 202; *pl.* xxx, *f.* B.

*Icica serrata* DC. Prodr. 2: 77. 1825. Mexico.

2. **TETRAGASTRIS** Gaertn. Fruct. 2: 130. 1790.

*Hedwigia* Sw. Prodr. 4. 1788. Not *Hedwigia* Ehrh. 1781.

*Knorrea* Moc. & Sessé, in DC. Prodr. 2: 80, as synonym. 1825.

*Caproxylon* Tussac, Fl. Ant. 4: 87. 1827.

Trees with whitish bark. Leaves large, compound, pinnate, alternate; leaflets lanceolate, short-petiolulate. Inflorescence paniculate, axillary. Flowers polygamous. Calyx small, 4- or 5-lobed, the lobes equal and imbricate in the bud. Petals 4 or 5, alternating with the calyx-lobes, united into a short tube. Stamens 10-lobed. Ovary partly immersed, 4- or 5-celled. Fruit a drupe, globose, 2-4-celled.

Type species, *T. ossea* Gaertn.

Corolla-lobes equal to the tube; leaflets broadly lanceolate.

Corolla-lobes shorter than the tube; leaflets narrowly elliptic.

1. *T. balsamifera*.

2. *T. panamensis*.

1. **Tetragastris balsamifera** (Sw.) Kuntze, Rev. Gen. 107. 1891.

*Hedwigia balsamifera* Sw. Prodr. 62. 1788.

*Tetragastris ossea* Gaertn. Fruct. 2: 130. 1791.

*Bursera balsamifera* Pers. Syn. Pl. 1: 524. 1805.

*Caproxylon Hedwigii* Tussac, Fl. Ant. 4: 87. 1827.

*Hedwigia Tussaccii* Walp. Rep. 1: 559. 1842.

*Icica Hedwigia* A. Rich. Ess. Fl. Cuba 388. 1842.

A tree, 10-20 meters high with a trunk up to 50 cm. in diameter; young branches clothed with a reddish puberulence, very soon glabrate; leaflets 3-9, large, 7-12 cm. long, lanceolate, thickish, acuminate, entire; inflorescence paniculate, as long as the leaves or shorter; calyx cup-shaped, the lobes small; corolla 2 mm. long, at first puberulent outside, but soon glabrate; lobes of the corolla about half the length of the tube, inflexed; ovary glabrous; stigma sessile; drupes large, 2-3 cm. broad, glabrous.

TYPE LOCALITY: Hispaniola.

DISTRIBUTION: Cuba to Guadeloupe.

ILLUSTRATIONS: Sw. Fl. Ind. Occ. *pl.* 13; Tussac, Fl. Ant. 4: *pl.* 30; Baillon, Hist. Pl. 5: *f.* 284-293; Gaertn. Fruct. *pl.* 109.

## 2. *Tetragastris panamensis* (Engler) Kuntze, Rev.

Gen. 107. 1891.

*Hedwigia panamensis* Engler, Bot. Jahrb. 1: 42. 1880.

A tree 8-13 meters high with a trunk 3 dm. in diameter and a widely spreading top; branches grayish; leaflets 9-11, 6-10 cm. long, oblong-elliptic, acuminate, inflorescence short, with appressed reddish hairs; pedicels 1-2 mm. long; corolla 3 mm. long, puberulent without; lobes of the corolla much shorter than the tube, inflexed at the tip; ovary glabrous; drupes 2 cm. broad, much broader than high.

TYPE LOCALITY: Panama.

DISTRIBUTION: Panama.

ILLUSTRATIONS: Mart. Fl. Bras. 12<sup>2</sup>: *pl.* 60 (as *Hedwigia balsamifera*).

### DOUBTFUL SPECIES

*Hedwigia mexicana* DC. Prodr. 2: 80. 1825. This species is known only from a poor illustration (Moc. & Sessé, Calq. Dess. *pl.* 204), and the indications are that it is not a *Tetragastris*.

## 3. *DACRYODES* Vahl, Skr. Nat. Selsk. 6: 115. 1810.

Large trees. Leaves coriaceous, compound, once-pinnate; leaflets entire. Inflorescence a panicle, axillary, much shorter than the leaves, polygamous. Calyx cup-shaped, subtruncate. Petals 3, distinct, valvate in the bud, thick, ovate. Stamens 6, inserted at the base of the disk; filaments short, flat. Disk a thick ring. Style short; stigma flat. Ovary 3(?)-celled. Fruit oblong, 1-celled, 1-seeded.

Type species, *Dacryodes excelsa* Vahl.

### 1. *Dacryodes excelsa* Vahl, Skr. Nat. Selsk. 6: 117. 1810.

*Amyris hexandra* Hamilt. Prodr. 34. 1825.

*Bursera acuminata* DC. Prodr. 2: 78. 1825. Not *B. acuminata* Willd. 1806.

*Dacryodes hexandra* Griseb. Fl. Brit. W. Ind. 174. 1859.

*Pistacia occidentalis* Baillon, Adansonia 9: 181. 1874.

*Pachylobus hexandrus* Engler, in E. & P. Nat. Pfl. 3<sup>4</sup>: 243. 1896.

A tree 3-5 meters or even 25 meters high; bark on trunk gray, roughened; leaflets 5-7, oblong, entire, acuminate; panicle about 1 dm. long; pedicels 2-4 mm. long; calyx 1 mm. long; petals 2 mm. long; fruit 2.5 cm. long, smooth.

TYPE LOCALITY: Porto Rico.

DISTRIBUTION: Porto Rico to Grenada.

ILLUSTRATIONS: DC. Monog. Phan. 4: *pl.* 3, *f.* 39-44; Contr. U. S. Nat. Herb. 8: *pl.* 34; E. & P. Nat. Pfl. 3<sup>4</sup>: *f.* 138, *F-K*.

## 4. *ICICA* Aubl. Pl. Guian. 1: 337. 1775.

Trees. Leaves large, coriaceous, compound, pinnate; leaflets 3-7, large, entire. Inflorescence paniculate, axillary, usually many-flowered. Flowers perfect and polygamous. Calyx 4- or 5-lobed. Petals 4 or 5, distinct, valvate in the bud. Stamens 8 or 10. Ovary 3- to 5-celled. Fruit tardily dehiscent.

Type species, *Icica heptaphylla* Aubl.

Leaflets always 3; lateral nerves few (about 5).

Leaflets 5-7; lateral nerves numerous.

Flowers sessile.

Flowers not sessile.

1. *I. fragrans*.

2. *I. sessiliflora*.

- Leaf margins undulate.  
 Leaf margins not undulate.  
 Petals pubescent on the outside.  
 Inflorescence glabrous; ovary glabrous.  
 Inflorescence pubescent; ovary more or less pubescent.  
 Leaflets hairy along the midrib on upper surface.  
 Leaflets not hairy along the midrib on upper surface.  
 Leaflets narrowly lanceolate, long-acuminate.  
 Leaflets broadly oblong, short-acuminate.  
 Petals glabrous on the outside.  
 Inflorescence somewhat pubescent.  
 Ovary glabrous; leaflets glossy.  
 Ovary pubescent; leaflets dull.  
 Inflorescence quite glabrous.  
 Leaflets very glossy above.  
 Leaflets dull above.  
 Leaflets oblong.  
 Leaflets lanceolate.
3. *I. Copal*.  
 4. *I. glabra*.  
 5. *I. costaricensis*.  
 6. *I. confusa*.  
 7. *I. Pittieri*.  
 8. *I. lucida*.  
 9. *I. Palmeri*.  
 10. *I. cubensis*.  
 11. *I. panamensis*.  
 12. *I. attenuata*.

### 1. *Icica fragrans* Rose, sp. nov.

A tree 12-13 meters high, with a trunk 3 dm. in diameter; branches brownish, glabrous; leaves 7-9 cm. long, on long petioles, the petiolules elongate, the lateral ones 1.5-2.5 cm. long, the terminal one 4 cm. long; leaflets 3, 10-15 cm. long, glossy and finely reticulate above, paler, duller, and less reticulate beneath, oblong, with a broad cuneate base, acuminate, the lateral nerves few, distant, somewhat sunken above, prominent beneath; inflorescence shorter than the petioles; flowers unknown; fruit 2 cm. long, somewhat pointed, often flattened.

Type collected on the bank of Yamaniquey River, Oriente, Cuba, 1910, *J. A. Shafer 4240* (herb. N. Y. Bot. Gard.).

### 2. *Icica sessiliflora* Rose, sp. nov.

Doubtless a tree; branches glabrous; leaves large, 3-4 dm. long; petiole 7-12 cm. long, terete, glabrous; leaflets 5-7, oblong, 10-18 cm. long, rounded or slightly narrowed at base, abruptly short-acuminate, glabrous; lateral nerves 10-20; inflorescence paniculate, 1-2 cm. long, puberulent; flowers sessile; calyx-lobes broadly ovate, acute, 1 mm. long; petals glabrous, 3 mm. long; stamens about as long as the petals.

Type collected at Santo Domingo de Golfo Dulce, Costa Rica, March, 1896, *A. Tonduz 6989* (U. S. Nat. Herb. no. 398230).

### 3. *Icica Copal* Schlecht. & Cham. *Linnaea* 5: 601, 744. 1830.

*Protium Copal* Engler, in DC. Monog. Phan. 4: 83. 1883.

A tree; leaflets 7, subcoriaceous, oblong-elliptic, usually broad at base, 10-18 cm. long, 3-5 cm. broad, glabrous, entire but the margins somewhat undulate; nerves rather prominent; inflorescence paniculate, with appressed hairs, much shorter than the leaves; calyx 4-parted, the lobes triangular; petals 4, twice as long as the calyx; ovary 2-celled, glabrous at apex.

TYPE LOCALITY: Vera Cruz.

DISTRIBUTION: Eastern Mexico.

ILLUSTRATION: Schlecht. Hort. Hal. pl. 12.

### 4. *Icica glabra* Rose, sp. nov.

Probably a tree; branches light-colored, glabrous; leaflets 5, oblong, thickish, glabrous, rounded or slightly narrowed at base, short-acuminate, 10-15 cm. long, entire; inflorescence nearly glabrous, weak, 5-7 cm. long, narrow; calyx 4-lobed, the lobes broad and rounded at apex or slightly apiculate, nearly or quite glabrous; petals 4, pubescent without; ovary glabrous; fruit not seen.

Type collected in forest of Buenos Aires, Costa Rica, in 1892, *A. Tonduz 6682* (herbarium of Capt. John Donnell Smith).

### 5. *Icica costaricensis* Rose, sp. nov.

A tree; young branches light-colored, very pubescent; rachis of leaves pubescent; leaflets 5, lanceolate, thinnish, pubescent on both surfaces especially along the veins, narrowed at base, sometimes cuneate, attenuate above, 7-12 cm. long, entire; inflorescence

shortly paniculate, 4-5 cm. long, pubescent; calyx 4-lobed, the lobes ovate, acute, slightly pubescent; petals 4, slightly pubescent; ovary very pubescent.

Type collected at Las Delicias, Santa Clara, Costa Rica, Jan., 1897, *T. Biolley 10665* (herbarium of Capt. John Donnell Smith).

#### 6. *Icica confusa* Rose, sp. nov.

Probably a tree; branches light-colored, pubescent with reddish appressed hairs; leaflets 5-7, lanceolate, somewhat pubescent when young but soon glabrate, narrowed at base, long-acuminate, 8-12 cm. long; inflorescence narrow, pubescent; calyx 4-lobed, broad, reddish-pubescent; petals 4, reddish-pubescent; ovary pubescent.

Type collected in the valley of the Diquis, between the rivers Volcan and Convento, Costa Rica, *H. Pittier 12106* (herbarium of Capt. John Donnell Smith).

#### 7. *Icica Pittieri* Rose, sp. nov.

Probably a tree; young branches light-colored, with appressed pubescence; leaves very large, 2-4 dm. long; rachis of young leaves pubescent; leaflets 3-5, 10-20 cm. long, 5-10 cm. broad, rounded at base, abruptly acuminate, pubescent when young but nearly glabrate in age; inflorescence 5-7 cm. long, very pubescent; calyx 4-lobed, the lobes pubescent; petals 4, very pubescent without; immature fruit 2 cm. long, narrowed at base.

Type collected at Rio Blanco, Llanuras de Santa Clara, Costa Rica, *H. Pittier 13426* (herbarium of Capt. John Donnell Smith).

#### 8. *Icica lucida* Rose, sp. nov.

A tree; young branches reddish, glabrous; leaflets 5, lanceolate, shining, 6-8 cm. long, cuneate at base, acuminate, prominently reticulate beneath, glabrous; inflorescence an open elongate panicle, longer than the leaves, 10-15 cm. long, slightly pubescent; pedicels 1-2 mm. long; calyx 5-parted, the lobes ovate, acute; petals 2.5 mm. long, glabrous; ovary glabrous; style short; fruit not seen.

Type collected at Belmira near Santa Maria de Dota, Costa Rica, 1898, *A. Tonduz 11648* (U. S. Nat. Herb. no. 392031).

#### 9. *Icica Palmeri* Rose, sp. nov.

Probably a tree; branches glabrous; leaves large; leaflets 5-7, oblong, 10-12 cm. long, thickish, rounded at base, obtuse, dull-green, the veins prominent beneath; inflorescence apparently short and compact, perhaps slightly pubescent; pedicels short; calyx-lobes ovate, 2 mm. long; ovary pubescent; fruit 2 cm. long, shortly stalked at base, more or less flattened, obtuse or sometimes pointed, glabrous.

Type collected at San Dieguito, San Luis Potosi, Mexico, June, 1910, *E. Palmer 634* (herb. N. Y. Bot. Gard.).

#### 10. *Icica cubensis* Rose.

*Icica Copal* A. Rich. Ess. Fl. Cuba 386. 1842. Not *I. Copal* Schlecht. 1830.

A tree, glabrous; branches terete, glabrous; leaves pinnate; leaflets 3-7, elliptic, acuminate, entire, shining, 5-8 cm. long, somewhat unequal at base; flowers perfect, in short few-flowered racemes; calyx small, cup-shaped, 4-toothed; petals 4, ovate, acute; stamens 8, a little shorter than the petals; ovary 4-celled; fruit globose, 1.5 cm. long, obtuse, apiculate, usually 4-celled and 4-seeded.

TYPE LOCALITY: Vuelto Abajo, Cuba.

DISTRIBUTION: Cuba.

ILLUSTRATION: Sagra, Hist. Cuba 10: pl. 37.

This species is referred to the South American species *I. guianensis* Aubl. by Engler and to *I. heptophylla* Aubl. by Grisebach, but both are apparently wrong.

#### 11. *Icica panamensis* Rose, sp. nov.

A small tree 5-7 meters high; branches smooth; leaves large, 3-4 dm. long; petioles stout, terete, 6-7 cm. long; leaflets 5-7, large, 12-18 cm. long, oblong, obtuse, hardly acuminate, dull, finely reticulate, glabrous; inflorescence a rather short panicle, glabrous; pedicels 1-2 mm. long; calyx cup-shaped, the lobes small, broad and rounded; petals 4;

ovary glabrous, narrowed at base, acuminate; stigma subsessile, 4-lobed; fruit oblong, 2.5 cm. long, pointed, glabrous.

Type collected at Gatun Station, Panama Railroad, February 2, 1860, *Sutton Hayes 462* (U. S. Nat. Herb. no. 371899).

12. *Icica attenuata* Rose, sp. nov.

Probably a tree; branches terete, glabrous; leaves pinnate; leaflets 5, lanceolate, long-acuminate, entire, dull-green, 6-10 cm. long; flowers perfect, in slender narrow panicles 5-7 cm. long; calyx small, usually 5-toothed; petals usually 5, oblong, obtuse, 2 mm. long; fruit 2-2.5 cm. long, glabrous, attenuate at the apex.

Type collected on Guadeloupe Island, in 1893, *Duss 3273* (U. S. Nat. Herb. no. 846786).

DOUBTFUL SPECIES

*Icica guianensis* Aubl. is recorded by Grisebach (under the name *I. heptaphylla* Aubl.) as occurring in Jamaica, St. Lucia, and St. Vincent.

*Icica leptostachya* Turcz. Bull. Soc. Nat. Mosc. 31<sup>1</sup>: 473. 1858. Glabrous; leaflets 7, oblong-elliptic, obtuse, one-sided, entire; inflorescence racemose, axillary, longer than the petioles; branches short; flowers 4-parted; style very short, subconic. Vera Cruz, based on *Galeotti 3493*. The relationship has not been determined.