Family 71. **MALPIGHIACEAE.** Malpighia Family

Herbs, vine, shrubs, or trees with opposite, simple, stipulate leaves. Flowers perfect, solitary, or in cymes or racemes. Cleistogamous flowers accompanying other flowers or absent. Sepals 5, some or all of them bearing 1–2 sessile or stipitate glands or rarely glandless. Petals 5, distinctly clawed, blade often toothed, fimbriate, or lobed. Stamens 5 or 10, or fewer by abortion; filaments united below middle or toward base or rarely distinct. Ovary superior, sessile, frequently lobed, 2–5-carpellate but usually with 3 winged or unappendaged carpels. Fruit a capsule, drupe, nut, or samara, latter variously winged and often crested.

Fruit strongly winged samaras; calyx bearing 8–10 glands (on cup or sepals or divided between them), rarely lacking in *Heteropteris*:
- Samaras with lateral wings, these in ours united to form an orbicular wing:
  - Fertile stamens 10; styles distinct; lateral samaras 4–5 cm. wide, rounded at base ..... 1. *Mascagnia*
  - Fertile stamens (in ours) 3 or 2; styles united; lateral samaras 8–10 mm. wide, mucronate at base ..... 2. *Gaudichaudia*
- Samaras with dorsal wings only:
  - Wings of samaras distinctly thickened along lower (or outer) edge; fertile stamens 10; styles 3, distinct ..... 3. *Heteropteris*
  - Wings of samaras not noticeably thickened along either edge; fertile stamens 2–7; styles united ..... 4. *Janusia*

Fruit of nutlets, a capsule, or a drupe; calyx glandless or essentially so in *Echinopterys* and *Thryallis*, the others with 6–10 glands on calyx-cup or sepals:
- Calyx glandless; fruit a capsule or of bristly nutlets:
  - Style 1; fruit of 3 bristly nutlets; panicles slender, elongate ..... 5. *Echinopterys*
  - Styles 3; distinct; fruit a capsule; panicle broadly pyramidal ..... 6. *Thryallis*
- Calyx bearing 6–10 glands; fruit a drupe:
  - Styles 3, distinct; stigmas minute, inconspicuous; flowers in short axillary cymes ..... 7. *Malpighia*
  - Styles united into a single column; stigma distinctly 3-lobed; flowers in panicles ..... 8. *Bunchosia*

1. **MASCAGNIA** Bertero, in Colla, Hort. Ripul. 86, 1824

Climbing or trailing vine or upright shrubs. Leaves opposite, simple, leathery or thin, entire. Sepals 5, persistent; calyx bearing 8–10 glands. Petals yellow, blue, violet, or purple, blades broad, margins various. Stamens 10; filaments lanceolate or subulate. Ovary superior, 3-lobed. Styles 3, distinct. Fruit of 3 samaras, with distinct or united lateral wings, dorsal wing smaller than laterals or absent. Cotyledons nearly equal, foliaceous.

1. **Mascagnia macroptera** (Sessé & Moc.) Niedenzu, Gen. Masc. 27, 1908

Hiraea macroptera Sessé & Moc. ex DC., Prod. **1**: 586, 1824.
Hiraea septentrionalis Juss., Ann. Sci. Nat. II, **13**: 259, 1840.
Hiraea greggii S. Wats., Proc. Amer. Acad. **17**: 333, 1882.
Hiraea mexicana Rose, Contr. U.S. Nat. Herb. **1**: 312, 1895.
Mascagnia septentrionalis Niedenzu, in Engler & Prantl, Nat. Pflanzenf. **3⁴**: 55, 1896.

A trailing or scrambling vine or an erect shrub to 2 m. tall with slender stems and pale smooth bark; petioles 3–5 mm. long; leaf blades ovate, oblong, or oblong-lanceolate, 5–22 mm. wide, 2.5–7 cm. long, acute at apex, acute to rounded at base, entire, sparsely strigose to glabrate beneath, several small glands borne at various points on petiole, at base of blade, or sometimes lacking; sepals broadly ovate, 2.5–3.5 mm. long, tomentulose on outer surface; glands oval, 0.6–1.5 mm. long, dark reddish purple to nearly black; petals yellow, 6–12 mm. long, markedly different in size, blade ovate, orbicular, to obovate, erose-denticulate, claw short; samaras 4–5.5 cm. wide, slightly longer, flabellate lateral wings undulate and entire to coarsely erose, sparsely appressed-pubescent.

Along rocky washes, on hillsides and sandy plains, Lower Sonoran and Tropical Zones, central Baja California and central Sonora, almost throughout Mexico. Flowering following rains.

2. **GAUDICHAUDIA** H. B. K., Nov. Gen. & Sp. **5**: 156, 1822

Trailing or climbing vines or shrubs, stems much branched. Leaves opposite; blades entire, cordate, auricled at base, or merely narrowed into petiole, mostly pubescent. Calyx with 8 or 10 glands. Sepals 5, persistent, each bearing 2 glands near base, or one or two sepals lacking one or both glands. Petals 5, yellow, toothed or lacerated. Stamens 5, two or three sometimes sterile. Ovary 3-lobed. Samaras usually 3, lateral wings united or free. Abnormal flowers with some parts reduced or absent often occur in same inflorescence as normal ones.

1. **Gaudichaudia mucronata** (Sessé & Moc.) Juss., Ann. Sci. Nat. II, **13**: 253, 1840

Hiraea mucronata Sessé & Moc. ex DC., Prod. **1**: 586, 1824.
Gaudichaudia filipendula Juss., Ann. Sci. Nat. II, **13**: 252, 1840.

A twining vine with slender, appressed-strigose branches; petioles slender, 3–6 mm. long, densely strigose with yellowish hairs; leaf blade oblong-ovate, 12–22 mm. wide, 3–8 cm. long, weakly auricled or rounded at base, acute and mucronate at apex, dark green and sparsely strigose above, cinereous-tomentose beneath, a few stiff, yellowish, appressed hairs along midrib and main laterals; sepals ovate, 3–4 mm. long, strigose, glabrous glands about 1 mm. long; petals yellow, to 6–8 mm. long, blades ovate to suborbicular, erose-denticulate; samaras suborbicular, 8–12 mm. high, rounded at apex, narrowly keeled at base, coarsely strigose in youth but eventually nearly glabrous, purplish.

Hillsides, canyons, and rocky slopes, mostly Upper Sonoran Zone, southeastern Sonora eastward into Chihuahua and south and east to Vera Cruz and Oaxaca. Feb.–April.

Gaudichaudia schiediana Juss. was reported from Sonora by Standley but I have seen no specimens from that area.

3. HETEROPTERIS H. B. K., Nov. Gen. & Sp. 5: 163, 1822

Vines, shrubs, or trees. Leaves opposite, leathery, entire or mostly so. Inflorescence paniculate or cymose. Calyx with 8 glands or these lacking. Sepals 5, persistent. Corolla yellow, orange, or purple. Petals 5. Stamens 10, all functional; filaments subulate. Ovary 3-lobed. Styles 3, distinct, subequal. Samaras 2–3 together or solitary, wing thickened along outer edge.

1. Heteropteris palmeri Rose, Contr. U.S. Nat. Herb. **1:** 311, 1895.
Heteropteris portillana Rose, op. cit. 95, 1891. Not *H. portillana* S. Wats., 1887.
Banisteria palmeri C. B. Robinson, in Small, N. Amer. Fl. **25:** 135, 1910.

Leaf blades ovate to lanceolate, bearing 2 (rarely 1) stipitate glands on margins near base, 8–15 mm. wide, 2–7 cm. long, mucronulate at apex, bright green above, pale and finely veined below, glabrous or glabrate, margin often faintly revolute; sepals ovate, 2.5–3 mm. long, puberulent, glands at least half as long; larger petals 5–6 mm. long, pink; samaras 1.5–2.5 cm. long, reddish, minutely pubescent, slightly auricled at base on the inner side; body of the fruit with a low denticulate crown on each side and parallel to wing, 1–1.5 mm. high.

Canyons and valleys, upper margin of Lower Sonoran and into Upper Sonoran Zone, southeastern Sonora and southward into Sinaloa. Following rains.

4. JANUSIA Juss., Ann. Sci. Nat. II, 13: 250, 1840

Somewhat woody vines. Leaves opposite, entire, short-petioled. Inflorescences of axillary clusters, or flowers solitary. Calyx with 8 (or 10) glands. Sepals 5, narrow, persistent. Petals 5, yellow, unequal, long-clawed, blades broad, undulate-margined. Glandless cleistogamous flowers with reduced petals often occurring with petaliferous flowers. Stamens 5–7 or reduced to 3. Ovary usually 3-lobed. Styles united. Stigma entire. Samaras usually 2 or 3, sometimes only one developing, each with a dorsal wing.

Leaves linear or lanceolate; larger petals 3–5 mm. long:
  Leaves narrowly lanceolate, plane, bearing 1–5 short-stipitate or sessile, marginal glands near base; samaras 9–12 (–16) mm. long ..... 1. *J. gracilis*
  Leaves linear, strongly revolute, no glands visible; samaras 7–10 mm. long .. 2. *J. linearis*
Leaves broadly elliptic, ovate, or oval; larger petals 5–7 mm. long ..... 3. *J. californica*

1. Janusia gracilis A. Gray, Pl. Wright. **1:** 37, 1852

A slender twining vine to 3 m. tall with strigose-cinereous branches; leaf blades linear-lanceolate, 3–7 mm. wide, 1.5–4 cm. long, or upper ones smaller, plane or margins faintly revolute, acute to acuminate, sparsely appressed-pubescent above, somewhat more densely so and slightly paler beneath, 1 to several small marginal glands near base; pedicels slender, 2–5 mm. long in flower, 1–1.5 cm. long in fruit; sepals ovate-oblong, about 2.5 mm. long, glands 0.8–1 mm. long; petals yellow, occasionally suffused with red or turning red in age, larger ones 4–5 mm. long, blades rhombic or broadly ovate; bodies of samaras coarsely veined, wings 9–12 mm. long or rarely to 16 mm. long.

Rocky hillsides and gravelly slopes and along arroyos, Lower and Upper Sonoran Zones, central Mohave and Cochise Counties, Arizona, to western Texas, Chihuahua, Sonora, and central Baja California. March–Oct.

2. Janusia linearis Wiggins, Contr. Dudley Herb. **3:** 69, *pl. 16, figs. 10–14,* 1940

A scandent vine with slender, densely silvery-strigose branches 1–2 m. long, underlying bark reddish; leaves narrowly linear, 1–3.5 mm. wide, 3–6 cm. long, acute at apex, acute or rounded at base, dark green and sparsely strigose or later glabrate above, densely silvery-strigose beneath, margins strongly revolute; petioles 1–2 mm. long; pedicels 3–8 mm. long, bibracteate about middle; sepals broadly ovate, 0.6 mm. wide, 1.5–2 mm. long, acute, densely puberulent, basal glands about 0.6–0.8 mm. in diameter; petals 3–4.5 mm. long, blade ovate to suborbicular, somewhat cucullate; fertile stamens 1–3; samaras reddish, strigose but eventually nearly glabrate, wings 7–10 mm. long.

Rocky hillsides in interior foothills, Lower Sonoran Zone, from the vicinity of Carbó and Ures to hills near Navajoa, Sonora. March–Oct.

3. Janusia californica Benth., Bot. Sulph. 8, *pl. 4,* 1844

A twining or scandent vine with slender, pale-pubescent branches to 3 m. long; petioles slender, strigose, 1–5 mm. long; leaf blades ovate, elliptic, or oval, 5–20 mm. wide, 1–4 cm. long, thinly strigose on both surfaces, rounded, truncate, or shallowly cordate at base, acute or rounded and apiculate at apex; sepals oblong-ovate, 2.5–3 mm. long, glands about 1 mm. long; petals yellow, turning reddish or brownish, larger ones 5–7 mm. long, blades suborbicular, crispate-margined but not markedly cucullate; samaras 9–11 mm. long, often reddish, pubescent but eventually glabrate or nearly so.

Gravelly slopes, arroyo banks, and rocky hillsides, Lower Sonoran Zone, western Sonora south of Isla Tiburón and central to southern Baja California. A shade form with exceptionally large leaves (2.5 cm wide, 4.5 cm. long) has been collected near Loreto, Baja California. Jan–Sept.

5. ECHINOPTERYS Juss., Arch. Mus. Paris 3: 342, 1843

Shrubs with slenderly branched, pliable stems. Leaves alternate or sometimes subopposite, blades thickish, entire. Inflorescences terminal, elongate panicles. Calyx glandless. Sepals 5. Petals 5, yellow, unequal, blades dentate. Stamens 10, all functional; filaments broad, pubescent. Ovary 3-lobed. Styles united. Stigma 3-lobed. Fruit 3-lobed, hirsutulous and bristly with terminally hooked, laterally puberulent, weak spines, separating into 3 nutlets at maturity.

1. Echinopterys eglandulosa (Juss.) Small, N. Amer. Fl. **25:** 148, 1910
Bunchosia eglandulosa Juss., Ann. Sci. Nat. II, 13: 325, 1840.
Echinopterys lappula Juss., Arch. Mus. Paris 3: 342, 1843.
Coelostylis eglandulosa Kuntze, Rev. Gen. Pl. 1: 88, 1891.

Shrub to 2 m. tall, young branches strigose-cinereous; leaf blades ovate, ovate-lanceolate, or oblong, 1–3 cm. long, abruptly acute to mucronate, sparsely strigose in youth; panicles 1–4 dm. long; sepals ovate to oblong, 3–4 mm. long, appressed-pubescent, eglandular; petals 4–10 mm. long, longer ones with cordate blades; carpels 4–5 mm. long, 2.5–3 mm. wide, pubescent and bristly.

Sandy washes and plains and rocky hillsides, Lower Sonoran Zone to subtropics, vicinity of Altar, Sonora, to Morelos, Zacatecas, and Oaxaca. Sept.–May.

6. THRYALLIS L., Sp. Pl. ed. 2, 554, 1762

Shrubs or small trees. Leaves opposite, blades entire. Inflorescences racemelike panicles with deciduous bracts and bractlets. Calyx glandless or with small glands. Sepals 5, persistent. Petals 5, yellow or turning red, blades abruptly narrowing to claws. Stamens 10, all functional; filaments united basally, glabrous. Ovary 3-lobed. Styles 3, distinct. Fruit a 3-lobed capsule.

Leaves ovate, oblong, or oval; stems, leaves, and ovary glabrous ..... 1. *T. glauca*
Leaves linear, linear-lanceolate, or lowermost sometimes ovate; stems and ovary pubescent (leaves glabrous in *T. angustifolia*, pubescent in *T. vestita*):
Petals 4–6 mm. long, not apiculate; leaves glabrous; sepals reddish, essentially glabrous .. 2. *T. angustifolia*
Petals 6–8 mm. long, minutely apiculate; leaves densely strigose; sepals green, pubescent ..... 3. *T. vestita*

1. Thryallis glauca (Cav.) Kuntze, Rev. Gen. Pl. **1:** 89, 1891
Galphimia glauca Cav., Ic. **5:** 61, *pl. 489*, 1799.
Malpighia glauca Pers., Syn. Pl. **1:** 506, 1805.
Galphimia gracilis Bartl., Linnaea **13:** 552, 1839.
Galphimia latifolia Bartl., op. cit. 553.
Galphimia grandiflora Bartl., op. cit. 554.
Galphimia humboldtiana Bartl., op. cit. 555.
Galphimia paniculata Bartl., op. cit. 556.

Shrub 1–3 m. tall with glabrous stems, leaves, and petioles; leaf blades ovate, oblong, or oval, 1–3 cm. wide, 1–7 cm. long, obtuse to acute, cuneate to rounded at base, conspicuously glaucous beneath, 1–2 sessile glands borne near base of margin or toward upper end of slender petiole; panicle 1–3 dm. long, often considerably branched, pyramidal; pedicels slender, 1.5–2.5 cm. long, these and branches of panicle rusty-pubescent; sepals lanceolate to oblong, 3–5 mm. long, glabrous; petals yellow, ovate, 10–13 mm. long, claw 1–2 mm. long; ovary glabrous; capsule subglobose, shallowly 3-lobed, 5–6 mm. in diameter, slightly exceeding sepals.

Canyons and open rocky slopes, mainly Upper Sonoran Zone, southeastern Sonora to Central America and the West Indies. Not an element of the flora of the desert proper. Flowering almost throughout year.

2. Thryallis angustifolia (Benth.) Kuntze, Rev. Gen. Pl. **1:** 89, 1891
Galphimia angustifolia Benth., Bot. Sulph. 9, *pl. 5*, 1844.
Galphimia linifolia A. Gray, Gen. Ill. **2:** 196, 1849.
Galphimia linifolia β *oblongifolia* A. Gray, Pl. Wright. **1:** 36, 1852.
Galphimia angustifolia var. *oblongifolia* S. Wats., Proc. Amer. Acad. **24:** 42, 1889.
Thryallis linifolia Kuntze, Rev. Gen. Pl. **1:** 89, 1891.
Thryallis angustifolia oblongifolia Vail, Bull. Torrey Club **22:** 228, 1895.

A tufted shrub to 1 m. tall with closely strigose, slender stems, young branchlets usually reddish; petioles 4–7 mm. long; leaf blades linear to lanceolate or lower ones ovate, 4–10 (rarely –15) mm. wide, 1–4 cm. long, acute to obtuse at apex, glabrous, paler beneath than above, bearing 2 sessile, marginal glands near base; panicle few-flowered, strigose; sepals lanceolate to oblong, 3–4 mm. long, glabrous, reddish; petals yellow, turning reddish, to 6 mm. long, tips obtuse or rounded, margins minutely erose; capsules broadly obovoid, 3–3.5 mm. wide, 4–5.5 mm. high, glabrous or nearly so; seeds yellowish, shining.

Rocky or gravelly slopes and arroyos, mainly Lower Sonoran Zone, vicinity of Santa Rosalia to Cabo San Lucas, Baja California, and in Sonora and adjacent northern Mexico to Texas. Sept.–March.

3. Thryallis vestita (S. Wats.) Rose, Contr. U.S. Nat. Herb. **12:** 281, 1909
Galphimia vestita S. Wats., Proc. Amer. Acad. **21:** 421, 1886.

Tufted suffrutescent plant 2–4 dm. tall from a heavy woody taproot, densely strigose-cinereous throughout; petioles 1–4 mm. long or leaves subsessile; leaf blades linear-lanceolate, 3–7 mm. wide, 1–5 cm. long, attenuate toward apex, acute to cuneate at base, heavy vestiture obscuring 2 sessile marginal glands near base; inflorescence 1–1.5 dm. long; bracts linear, 5–10 mm. long; pedicels slender, 5–6 mm. long at anthesis, nearly twice as long in fruit; sepals linear-lanceolate, 4–5 mm. long, strigose, green; petals (in ours) 6–8 mm. long, yellow but turning red or pink, blade ovate, minutely emarginate-apiculate, claws 1–1.5 mm. long; capsules 3–5.5 mm. high, about 4 mm. in diameter, sparsely puberulent; seeds dark brown to nearly black, shining.

Sandy arroyos and arid slopes, Sonoran Zones, east-central and southeastern Sonora (near Divisadero and in Río Mayo region) and southwestern Chihuahua. Until recently known only from the type locality in Chihuahua. Flowering in September in Sonora.

7. MALPIGHIA L., Sp. Pl. 425, 1753

Shrubs or small trees with opposite, glabrous, or variously pubescent, entire or toothed, simple leaves. Inflorescences cymose, axillary. Sepals 5, persistent, not appreciably accrescent, bearing 6–10 sessile glands. Petals 5, white, pink, or red, blades undulate, erose-dentate or fimbriate, sometimes concave or keeled. Stamens 10; filaments united almost or quite to middle, glabrous. Ovary 3-lobed, glabrous. Styles distinct. Stigmas small. Fruit a depressed or slightly elongate, red or orange drupe.

Petals 9–10 mm. long; anthers globose; sepals tomentose, not bearded .... 1. *M. diversifolia*
Petals 5–6 mm. long; anthers cordate; sepals bearded ..... 2. *M. ovata*

1. Malpighia diversifolia Brandegee, Zoe **5:** 104, 1901

A widely branching shrub to 3 m. tall with slender twigs densely but finely tomentulose in youth, later glabrate and brown; petioles 1–3 mm. long, tomentulose; leaf blades broadly obovate to orbicular, 2–4.5 cm. long, 1.5–3.5 cm. wide, tomentose on both surfaces when young, green and nearly or quite glabrous above when older, margins entire, glandless; peduncles slender, 1–2.5 cm. long, tomentulose; pedicels 8–11 mm. long, bibracteate about at middle, densely pubescent above bracts, sparsely so to glabrate above them; sepals lance-ovate, 3–4 mm. long, pubescent, glands 1–1.5 mm. long; petals pink, larger ones to 1 cm. long, claws 3 mm. long, blade suborbicular, fimbriate, base truncate or nearly so; drupes bright red, strongly depressed, about 1 cm. in diameter, glabrous.

Along arroyos, in canyons, and on hillsides, Lower Sonoran Zone, southern Baja California. Aug.–Oct.

2. Malpighia ovata Rose, Contr. U.S. Nat. Herb. **1:** 310, 1895
Bunchosia parvifolia S. Wats., Proc. Amer. Acad. **24:** 42, 1889. Not *Malpighia parvifolia* Juss., 1843.
Malpighia watsoni Rose, Contr. U.S. Nat. Herb. **1:** 310, 1895.

An open shrub 1–2 m. tall or less with strigose branchlets; leaves ovate, oblong-ovate, or orbicular, quite variable as to size and shape, 1–6 cm. long, acute to obtuse or rounded at apex, bright green and sparsely pubescent above, paler and slightly more

densely pubescent beneath; peduncles shorter than leaves, densely pubescent; sepals oblong-ovate, 2.5–3 mm. long, bearded, each sepal bearing 2 glands 1–1.5 mm. long; petals pink, larger ones 5–6 mm. long, blades ovate; drupes bright red, depressed-ovoid, 8–9 mm. high, to 1.5 cm. in diameter.

Hillsides and rocky arroyos, Lower Sonoran Zone, western Sonora south to Oaxaca. Aug.–Oct.

Malpighia umbellata Rose, Contr. U.S. Nat. Herb. **1:** 310, 1895, occurs in southern Sonora in the vicinity of Alamos and southward into Sinaloa, but it appears to occur outside the limits of the Sonoran Desert.

8. BUNCHOSIA Rich. ex Juss., Ann. Mus. Paris 18: 481, 1811

Shrubs or trees. Leaves opposite, usually bearing glands on petioles or near base of entire blades. Inflorescences paniculate. Calyx with 8–10 glands, slightly accrescent. Petals 5, white or yellow, concave. Stamens 10. Ovary 2–3-lobed. Styles united. Stigma 3-lobed, capitate or discoid. Fruit an ovoid, globose, or reniform drupe.

1. Bunchosia sonorensis Rose, Contr. U.S. Nat. Herb. 1: 94, 1891

A shrub to 3–4 m. tall with minutely strigulose young twigs; leaf blades ovate, oblong, or lanceolate, 1–3 cm. wide, 2–7 cm. long, acute or obtuse at apex, acute to rounded at base, closely pubescent on both sides when young, later glabrate; pedicels stoutish, 1–4 mm. long, densely puberulent; sepals deltoid-ovate to oblong-ovate, 4–6 mm. long, tomentulose, glands 2–3 mm. long; petals yellow, larger ones 9–10 mm. long, inner petal broadly spatulate, others ovate to suborbicular; ovary and style pubescent; drupe 2-lobed, 12–15 mm. in diameter, dark red.

Rocky slopes and mesas, Lower Sonoran Zone, southern Sonora. The flowers are reported to be very fragrant. Sept.–Jan.