

FABACEAE LEGUME FAMILY

PART ONE: ERRAZURIA PHILLIPS, MARINA LIEBM., PARRYELLA TORR. & A. GRAY, AND PSOROTHAMNUS RYDB.

Suzanne Rhodes, June Beasley, and Tina Ayers

Deaver Herbarium
Biological Sciences, PO Box 5640
Northern Arizona University
Flagstaff, AZ 86011-5640

Trees, shrubs, herbs, or vines, often with nitrogen-fixing bacteria in root nodules. LEAVES alternate, usually compound (pinnate, bipinnate, palmate) sometimes simple; stipules present, sometimes developing into spines. INFLORESCENCE a terminal raceme, corymb, spike, or head. FLOWERS usually bisexual, actinomorphic to papilionoid, hypogenous or perigynous; sepals 5, free or fused into a tube that is regular or somewhat bilabiate; petals mostly 5, rarely reduced or absent, free or fused into a tube, or the 2 lower ones often fused and the three upper ones distinct; stamens 5–10; ovary superior, composed of a single carpel with a terminal style and stigma; ovules 1-many, placentation marginal. FRUIT usually dry and opening along both sutures (a typical legume), sometimes indehiscent, sometimes breaking into 1-seeded segments (a loment); seed with hard, often impervious testa, often long-lived; embryo typically large, with 2 conspicuous cotyledons. Ca. 700 genera and 18,000 spp. of worldwide distribution. Some authors treat the three subfamilies, Caesalpinoideae, Mimosoideae, and Papilionoideae, as distinct families.

Economically, legumes are one of the most important plant families, contributing food and forage throughout the world. They are well represented in Arizona, especially below the Mogollon Rim. On Rupert Barneby's last trip through the American West, he suggested to June Beasley that she describe this group of *Dalea* segregates (*Errazurizia*, *Marina*, *Parryella*, *Psorothamnus*) for the VPA project. These genera along with *Amorpha*, *Dalea*, and *Eysenhardtia* all belong to the tribe Amorpheae, which in turn belongs to the subfamily Papilionoideae with pea-like flowers. We here provide a key to the AZ genera of the Amorpheae and a taxonomic treatment of the *Dalea* segregates. The Amorpheae are members of the Papilionoideae, which generally have bilaterally symmetric flowers with the uppermost petal (the banner) external in the bud and the two lowermost petals forming a keel. The Amorpheae can be distinguished from other tribes of Fabaceae by a combination of characters, namely: the presence of oil glands in the epidermis of the stems, leaves, calyx and sometimes the petals, these parts aromatic when bruised; hairs simple, basifixed; inflorescence determinate; ovules usually 1–2; fruit usually 1-seeded, indehiscent, falling with the calyx.

Key to Genera of Amorpheae

1. Corolla none or reduced to the banner petal 2
 2. Petal 1, conspicuous, dark violet; filaments united at base; leaflets mostly 1–2 cm long *Amorpha*
 - 2' Petals none, or 1 inconspicuous pale yellow banner petal; filaments distinct; leaflets mostly 0.5–1.0 cm long 3
 3. Herbage with appressed to ascending long, straight, soft hairs; leaflets obovate to orbicular, obtuse or shallowly notched, 3–5 mm wide *Errazurizia*
 - 3' Herbage glabrate to sparsely strigose; leaflets narrowly linear to narrowly obovate, acute, concavely folded, not more than 2 mm wide *Parryella*
- 1' Corolla with 5 petals 4
 4. Shrubs with white corollas; flowers in elongate, spike-like racemes; pods thin, flat, long exserted from calyx *Eysenhardtia*
 - 4' Herbs or shrubs, if shrubs the corolla not white; flowers in loose or dense heads or spikes, or racemes; pods turgid, included in calyx, or long exserted in a few shrubby species 5
 5. Petals inserted on the calyx at base of stamen tube; trees and shrubs *Psorothamnus*
 - 5' Petals (the paired ones) inserted on the stamen tube; herbs, subshrubs, or small shrubs 6
 6. Ovule solitary; flowers short-pedicellate; hairs of calyx usually grayish white *Marina*
 - 6' Ovules 2, but only one maturing into a seed; flowers sessile; hairs of calyx usually brownish yellow *Dalea*

Errazurizia Philippi Round-leaf Dunebroom

Low, stiff, gnarled, aromatic shrubs. STEMS much-branched, unarmed, light gray-green, becoming gnarled and gray in age, with prickly-shaped glands and appressed to ascending long, straight, soft hairs. LEAVES alternate, deciduous, odd-pinnate with (10–)14–20(–30) pairs of obovate to orbicular, obtuse or shallowly notched, flat leaflets, glandular punctate especially beneath, densely pubescent; stipules small, deciduous. INFLORESCENCE a terminal, short, few-flowered raceme; bracts early deciduous. FLOWERS apetalous or very rarely with a small, inconspicuous pale yellow banner; calyx turbinate or campanulate, with tube 10-ribbed, with broad, short teeth, bearing 2–5 orange glands in the rib intervals, densely silky-hairy along margins and within; stamens 10, basally united; ovary 2-ovuled. FRUIT a 1-seeded indehiscent pod, exserted from the calyx, ellipsoid to obovoid, gray canescent, conspicuously red gland-dotted, beaked by a persistent style. —4 spp.; w US, Baja C. and coastal Son., Mex., Chile (for Errazuriz family of Chile). Barneby, Rupert C. 1977. Mem. New York Bot. Gard. 27:13–21, 594, 597.

Errazurizia rotundata (Wooten) Barneby (rounded, in reference to the leaflets) (Figs. 3A, 5A–B). —Low, twiggy, sometimes sprawling subshrub up to 30–40 cm high with repeated branching upwardly. LEAVES 3–14 cm long; leaflets 1–7 mm long, 1–4 mm wide. CALYX 4.5–6.0 mm long; filaments light green,

conspicuously exerted from the calyx and nearly twice as long; anthers bright yellow. FRUIT 9.5–12.0 mm long, up to 5 mm wide. [*Parryella rotundata* Wooten]. —On red or white sandstone pavement and ledges, in sandy crevices among rocks, or in loose, drifted sand: Coconino, Navajo cos. (Fig. 1A); 1350–1500 m (4500–5100 ft); Apr-early May; known only from a few localities in n AZ, all within the drainage of the Little Colorado River.

Marina Liebm. False Prairie-Clover

Perennial herbs or shrubs, aromatic when bruised. STEMS much-branched, unarmed, sparsely pubescent with straight or curly reddish hairs; glands sparse or absent. LEAVES alternate, deciduous, petiolate, odd-pinnate with 3–10 pairs of obovate to oblong-obovate or shallowly notched flat leaflets, glabrous to pubescent; stipules small, deciduous. INFLORESCENCE a terminal raceme or open panicle; bracts early deciduous. FLOWERS with showy bi-colored petals; calyx turbinate to campanulate, the tube 10-ribbed, bearing 2–5 yellow, orange, or red-brown glands between the ribs; calyx lobes shorter than the tube; petal wings and keel elevated on a column continuous with the staminal tube; stamens generally 10, the filaments fused; ovary 1-ovuled. FRUIT a 1-seeded pod, ovoid, exerted from the calyx, conspicuously red gland-dotted, beaked by a persistent style. —38 spp.; sw U.S. (CA, NM, NV), Mex., C. Amer. (In honor of Marina or Melinche, interpreter for Cortés during the conquest of Mexico). Barneby, Rupert C. 1977. Mem. New York Bot. Gard. 27:55–135.

1. Plants decumbent or nearly so; stems entirely herbaceous; inflorescence a dense, pilose raceme; stems and leaflets hairy, not glandular *M. calycosa*
 1' Plants upright; stems ascending, often shrubby or slightly woody at the base; inflorescence a loose raceme or panicle; stems and leaflets glabrous or sparsely hairy, glandular 2
2. Plants herbaceous when young, becoming suffrutescent in age, the stems green; inflorescence a loose, many-flowered raceme; common throughout the Arizona Sonoran desert *M. parryi*
- 2' Plants shrubby, the stems reddish; inflorescence a repeatedly and finely branched panicle; in AZ only in extreme s Santa Cruz Co. *M. diffusa*

Marina calycosa (A. Gray) Barneby (remarkable calyx). San Pedro False Prairie-clover (Fig. 4A). —Prostrate perennial herbs with glandless or nearly glandless foliage and racemes. STEMS gray-green, branched from the middle, sparsely canescent, to 30 cm long. LEAVES 1–3 cm long, shortly petiolate; leaflets obovate to oblong-obovate, 2–3 mm long, 1–2 mm wide, white pubescent. INFLORESCENCE a dense raceme 1.5–6.5 cm long. FLOWERS 7–10 mm long; calyx lobes narrowly triangular, 2.0–2.5 mm long, acute, longer than the tube, ribbed, with prominent veins, pilose; petals purple and white. FRUIT an obliquely-obovoid pod, 3.0–3.5 mm long with two rows of glands on each side. [*Dalea calycosa* A. Gray]. —Dry, open slopes and grasslands: Cochise, Graham, Pima,

Pinal, Santa Cruz cos. (Fig. 1B); 1150–1500 m (4000–5000 feet); Apr–Sep; se AZ, NM; Son. Mex.

Marina diffusa (Moric.) Barneby (diffusely branched in reference to the panicle). Spreading False Prairie-clover (Fig. 4B). —Glabrous subshrubs or suffrutescent herbs, 1.0–2.5 m tall. STEMS purple-red, repeatedly branching into slender wand-like capillary branchlets, sparsely glandular, with few fine, long hairs. LEAVES 0.5–2.5 cm long, short-petiolate; leaflets oblong-obovate, 3–5 mm long, 1–2 mm wide, gland dotted especially around the margins, glabrous. INFLORESCENCE an open finely branched panicle, the branches 2–6 cm long. FLOWERS 4–6 mm long; calyx lobes ovate, ca. 0.8 mm long, obtuse, shorter than the tube, unribbed and without prominent veins, glabrous; petals dark rose-purple and whitish. FRUIT a plumply obovoid pod, 2.7–2.9 mm long, glandular distally. [*Dalea diffusa* Moric.]. —Brushy hillsides: Santa Cruz Co. (Fig. 1C); 1350–1500 m (4500–5000 ft); Sep–Oct. Mex., Guatemala.

The Mexican name for this plant is Escoba Colorada (Red Broom) in reference to the reddish stems. The species is recognized by Barneby (1977) to have two varieties. The only AZ collection (*Hodgson et al.* 4771, ASU, DES) appears to be *M. diffusa* var. *diffusa*. The leaves are early deciduous and during the dry season individuals look like a clump of red-purple branches terminating in masses of slender panicles.

Marina parryi (Torr. & A. Gray) Barneby (for C. C. Parry). Parry's False Prairie-clover (Fig. 5C). —Erect, suffrutescent perennial, 1.5–4.0 m tall. STEMS green, brittle, much-branched from the base, dotted with dark reddish glands. LEAVES 1–4 cm long, long-petiolate; petioles 5–8 mm; leaflets obovate 4–6 mm long, 2–4 mm wide, gland-dotted abaxially, sparsely canescent on both sides. INFLORESCENCE a loose raceme, 2–10 cm long. FLOWERS 5–8 mm long; calyx lobes triangular, ca. 0.8 mm long, acute, shorter than the tube, with canescent veins, without prominent ribs; petals bright blue-purple and white. FRUIT an obliquely obovoid and compressed pod, 1.8–2.4 mm long with two rows of glands on each side. [*Dalea parryi* Torr. & A. Gray]. —Common on low deserts on granitic or volcanic soils: Cochise, Gila, La Paz, Maricopa, Mohave, Pima, Pinal, Yavapai, Yuma cos. (Fig. 1C); 0–1150 m (0–3700 ft); Mar–Jun (all year); s CA; Baja C., Son. in Mex.

Parryella Torr. & A. Gray Dunebroom

Slender, erect, pliant shrubs with a citrus aroma. STEMS broom-like, unarmed, reddish or purplish brown, becoming whitish gray in age, with raised prickle-shaped glands, glabrate to sparsely strigose. LEAVES alternate, deciduous, odd-pinnate, with 11–43 pairs of leaflets, these narrowly linear to narrowly obovate, acute, concavely folded, stipellate, glandular-punctate, glabrate to sparsely strigose; stipules minute, deciduous. INFLORESCENCE a terminal, many-flowered, spike-like raceme, bracts inconspicuous. FLOWERS yellowish, apetalous; calyx turbinate

or campanulate, the tube obscurely ribbed near base and bearing sparse orange-brown glands, with 5 broad, short teeth, these with fine short hairs on the margins; stamens 10, with filaments yellowish, distinct or nearly so, unequal, the longest exerted 2.0–3.5 mm from the calyx at anthesis; anthers yellowish; ovary 2-ovuled. FRUIT a one seeded, indehiscent pod, exerted from the calyx, obliquely oblong-obovoid, glabrous, conspicuously reddish-brown gland-dotted, beaked by a persistent style. Monotypic genus of the Colorado Plateau and upper Rio Grande Valley. (for C. C. Parry). Barneby, Rupert C. 1989. *Parryella* pp. 28–29 in Intermountain Flora, Vol. 3, Part B. Bronx, NY; New York Bot. Gard.

Parryella filifolia Torr. & A. Gray ex A. Gray (thread-like leaves) (Figs. 5D–E). —Shrubs 0.5–1.5 m tall. LEAVES (3–)5–17 cm long; leaflets 2–16 (–20) mm long, 0.3–1.5 mm wide. CALYX 2.5–3.5 mm long. FRUIT 6(–6.5) mm long, 2.5(–3) mm wide, slightly laterally compressed. —Shrubs of dry places, often forming large clumps in sandy clay bluffs, on gravelly or rocky ledges, in grassland, or deep sand, commonly in hummocky dunes: Apache, Coconino, Navajo cos. (Fig. 1D); 1500–1950 m (4900–6450 ft); May–Sep; NM, UT.

A variant with broader leaflets (16–20 mm wide) is found within the range of the typical form in northeastern AZ. According to Barneby (1989), it occurs sporadically and appears to be taxonomically insignificant. The Hopi reportedly use the twigs of *Parryella* to construct baskets and brooms, the seeds to alleviate toothache, and the leaves as an insecticide. Because *Parryella* is effective in the catchment of moving sand, it is of potential value in controlling erosion in sandy areas.

Psorothamnus Rydb. Indigobush

Subshrubs, shrubs, rarely tree-like (in *P. spinosus*). STEMS intricately branched, generally with thorns, glabrous to pubescent, dotted with prominent or inconspicuous, domed or prickle-shaped glands. LEAVES alternate, deciduous, petiolate, simple or odd-pinnate with 2–6(–8) pairs of linear to oblong leaflets, these flat or folded, glabrous to pubescent; pedicels generally with bractlets; stipules small, deciduous. INFLORESCENCE a congested or open raceme; bracts inconspicuous. FLOWERS racemose or spicate, the pedicels bibracteolate; calyx tube campanulate, 10-ribbed, bearing 1–5 yellow, orange, or red glands in the rib intervals; petals showy, purple, violet, or blue, inserted on the hypanthium rim; stamens 10, united more than half their length; ovary 2-ovuled. FRUIT a 1–2 seeded pod, ellipsoid to obovoid, conspicuously red gland-dotted, beaked with a persistent style. —9 spp.; Sonoran, Chihuahuan, and Mohave deserts, in US from CA to TX (Greek for scurfy shrub). Barneby, Rupert C. 1977. Mem. New York Bot. Gard. 27:21–54, 598–607.

Psorothamnus polydenius should be looked for in the northwestern corner of the Arizona Strip. It can be differentiated from *P. fremontii* by smaller leaflets (< 4 mm long), smaller fruits (2.0–2.5 mm long), and a dense spike-like raceme.

1. Leaves simple (rarely 3-foliate) or absent 2
 2. Broom-like subshrub, to 1 m tall *P. scoparius*
 - 2' Divaricately branched shrubs or trees, 1–7 meters in height 3
 3. Leafy irregularly branched shrubs, sparsely thorny *P. schottii*
 - 3' Generally leafless trees, densely thorny *P. spinosus*
- 1' Leaves pinnately compound 4
 4. Subshrub less than 1 m tall; fruits 2.0–4.5 mm long 5
 5. Stems with inconspicuous glands; leaflets 5–9, the terminal one 2–3× longer than the laterals; inflorescence a dense, spheric raceme *P. emoryi*
 - 5' Stems with conspicuous glands; leaflets 7–1(–19), the terminal one similar in size to the laterals; inflorescence a loose, open raceme *P. thompsonae*
 - 4' Glabrous to pubescent shrubs more than 1 m tall; fruit 7–10 mm long 6
 6. Calyx teeth 3.6–5.2 mm long, longer than the tube; fruits glabrous or finely hairy, sparsely covered with rounded or elliptic glands ... *P. arborescens* var. *pubescens*
 - 6' Calyx teeth 1.8–3.2 mm long, generally shorter than tube; fruits glabrous, densely covered with elongate glands in rows *P. fremontii*

Psorothamnus arborescens (Torr. & A. Gray) Barneby (tree-like). Mojave Indigobush. —Shrubs, glabrous to pubescent, to 0.3–1.0 m tall. LEAVES pinnately compound, 1.8–6.0 cm long; glands inconspicuous. FLOWERS in a lax, open raceme, 3.0–7.5 cm long; calyx with prominent veins, the teeth 3.7–4.5 mm long, acuminate, longer than the tube. FRUIT 7–10 mm long, glabrous or finely hairy, sparsely covered with rounded or elliptic glands. —4 vars. found in western North America, AZ, CA, NV, UT.

Var. **pubescens** (Parish) Barneby (hairy) (Fig. 5F). —Leaflets 7–13, linear to narrowly oblanceolate, 0.8–1.2 mm long, 0.5–1.5 mm wide, the terminal one equal to the laterals. [*Dalea amoena* S. Wats, *D. amoena* S. Wats. var. *pubescens* (Parish) Peebles, *D. fremontii* Torr. ex A. Gray var. *pubescens* (Parish) L. Benson]. —On rocky knolls and talus at base of sandstone cliffs: Marble Canyon area, endemic to Coconino Co. (Fig. 2A); 1050–1470 m (3450–4850 ft); late Apr–Jun.

Psorothamnus emoryi (A. Gray) Rydberg. (for W. H. Emory). Dyebush. —Subshrub 0.3–1.0 m tall, tomentose; glands inconspicuous on stems. LEAVES pinnately compound; leaflets 5–9, oblong-ob lanceolate to elliptic, 4–16 mm long, 1–3 mm wide, the terminal one 2–3× longer than the laterals. FLOWERS in a dense, spheric raceme, 0.7–2 cm long; calyx densely pilose, with teeth 1.8–3.8 mm long, about the same length as the tube. FRUITS 2.3–2.8 mm long, finely hairy and glandular at apex. [*Dalea emoryi* A. Gray; *Parosela emoryi* (A. Gray) A. Heller]. —2 vars., w U.S.; Mex.

Var. **emoryi** —Calyx teeth 3.0–6.7 mm long, about as long as the tube. Fig. 5G. —deep sand, desert flats and dunes: Yuma Co. (Fig. 2B); 50–350 m; (150–1150 ft); Apr–Jun (fall). CA; Baja C., Son., Mex.

Psorothamnus fremontii (Torr. ex A. Gray) Barneby (for J. C. Fremont). Fremont's Dalea (Fig. 5H). —Shrubs, glabrous to appressed pubescent, to 1.5 m tall; glands inconspicuous. LEAVES pinnately compound; leaflets 3–5, linear to

oblong, 3–25 mm long, 1–2 mm wide, strigose. FLOWERS in a lax, open raceme; calyx teeth 1.8–3.2 mm long, generally shorter than tube. FRUIT 7–10 mm long, glabrous, densely covered with elongate glands in rows. [*Dalea fremontii* A. Gray]. —Sandy or rocky soils derived from granite and sandstone of washes, banks, and debris fans: w Coconino, Mohave, w Yavapai cos. (Fig. 2A); 350–1000 m (1200–3200 ft); (Mar) Apr–May; CA, NV, UT.

Two varieties have been recognized (Barneby 1977) and both were noted to occur in Arizona. *Psorothamnus fremontii* var. *fremontii* was separated from *P. fremontii* var. *attenuatus* Barneby based upon leaflet shape (narrowly obovate to linear-elliptic in var. *fremontii* vs. narrowly linear in var. *attenuatus*) and leaflet size (3–15 mm long × 1.5–4.0 mm wide in var. *fremontii* vs. 5–25 mm long × 1.0–1.2 mm wide in var. *attenuatus*). While the varieties as described by Barneby (1977) have overlapping ranges, var. *fremontii* generally occurs on sedimentary formations of limestone, and sandstone, and var. *attenuatus* occurs on volcanic and granitic bedrock. Two Arizona specimens (A. Phillips s.n., MNA and C. Schaack 1464, ASC) have narrowly linear leaflets but the leaflets are short, suggesting that they are diminutive leaves. Further collecting in Arizona is needed before these varieties can be recognized.

Psorothamnus schottii (Torr.) Barneby (for A. C. Schott). Schott's Indigobush. —Shrubs, divaricately branched, less than 2 m tall; branches sparsely canescent; glands inconspicuous. LEAVES persistent, simple (rarely 3-foliolate), linear, 2.5–6.0 mm long, 1.1–2.0 mm wide, canescent above, glabrous below, gland-dotted. FLOWERS in a lax, open raceme, 1–9 cm long; calyx teeth 0.5–0.8 mm long, much shorter than tube. FRUIT 7–10 mm long, glabrous, puberulent and densely covered with discrete glands at apex. [*Dalea schottii* Torr., *D. schottii* var. *puberula* (Parish) Munz]. —Gravelly benches and washes: Yuma Co. (Fig. 2C); 45–90 m (150–300 ft); Nov–May. Colorado Desert in CA; Baja C., Mex.

Psorothamnus schottii is broadly sympatric with *P. emoryi* but they generally inhabit very different habitats. They can easily be distinguished by coloration (*P. emoryi* is hoary white and *P. schottii* is green) and leaves (pinnately compound in *P. emoryi* vs. simple or rarely 3-foliolate in *P. schottii*).

Psorothamnus scoparius (A. Gray) Rydberg (broom-like). Broom Dalea (Figs. 3B, 5I). —Broom-like subshrubs up to 1 m tall; stems yellow-green, canescent, prominently dotted with pale yellow glands. LEAVES simple (rarely 3-foliolate), linear, 70–110 mm long, 0.8–1.2 mm wide; glands in two rows along the margin. FLOWERS in a short, dense raceme; calyx teeth 0.3–1.8 mm long, much shorter than tube. FRUIT ca. 4 mm long, pilose, with glands near apex. [*Dalea scoparia* A. Gray]. —Sandy dunes and washes: Cochise, Coconino, Navajo cos. (Fig. 2C); 1100–1550 m (3600–5000 ft); Jul–Sep; NM, TX.

Psorothamnus spinosus (A. Gray) Rydberg (spiny in reference to thorny branches). Smoketree (Figs. 5J–K). —Generally leafless trees, divaricately branched, densely thorny, to 7 meters tall; glands prominent. LEAVES early deciduous, simple, oblong to obovate, 3–22 mm long, 2–5 mm wide. FLOWERS in

a lax, open raceme; calyx teeth 0.8–1.5 mm long, shorter than the tube. FRUIT 4.2–5.3 mm long, glabrous except for marginal hairs at apex; with prominent glands. [*Dalea spinosus* A. Gray, *Parosela spinosa* (A. Gray) A. Heller]. —Sandy washes and roadsides where moisture collects: La Paz, Maricopa, Mohave, Pima, Yavapai, and Yuma, cos. (Fig. 2D); 60–750 m (200–2400 ft); mainly Jun; CA, NV; Baja C., Son., Mex.

Psorothamnus thompsonae (Vail) Welsh & Atwood (for E. P. Thompson). —Subshrub, less than 1 m tall, glabrous to puberulent; glands orange-brown, prominent. LEAVES pinnately compound; leaflets 7–17(–19), the terminal one similar in size to the laterals. FLOWERS in a loose, open raceme; calyx teeth 1.5–2.0 mm long, about the same as the tube, densely hairy. FRUIT 4.0–4.5 mm long, strigose with prominent glands. —2 vars. found in sw U.S., AZ, UT.

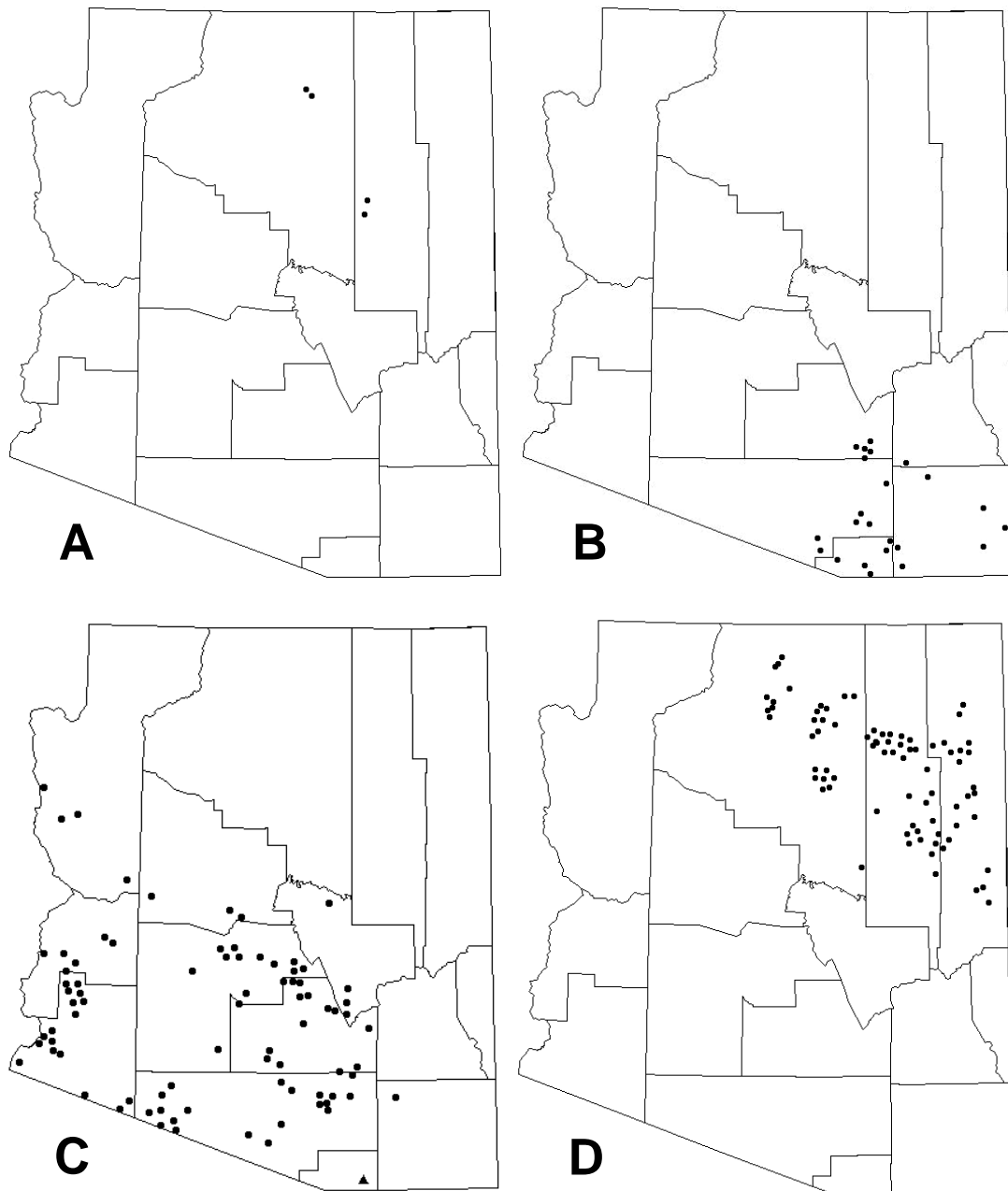
Var. **whitingii** (Kearney & Peebles) Barneby (for A. F. Whiting) (Fig. 5L). —Leaflets linear to oblong, 3–7 mm long, ca. 1 mm wide. [*Dalea whitingii* Kearney & Peebles]. —Low hills in deep sand and sandy washes: Coconino Co. (Fig. 2D); 1100–1850 m (4200–6000 ft); May–Aug; se UT.

ACKNOWLEDGEMENTS

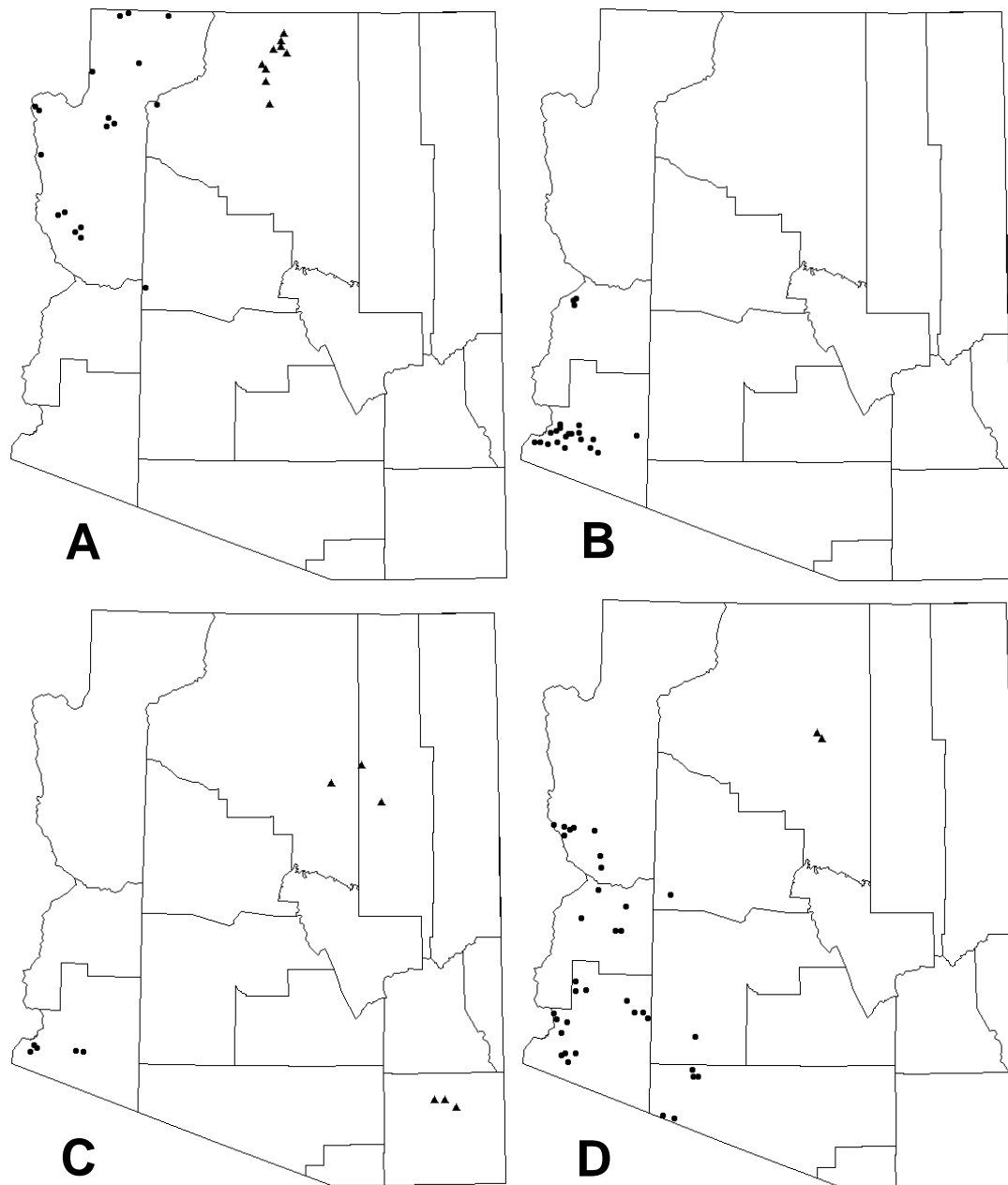
We thank the following herbaria for the use of their specimens: ASC, ASU, ARIZ, and MNA. Thanks also to H. David Hammond for his review of the manuscript and to Daniela Roth and Max Licher for the use of their photographs.

LITERATURE CITED

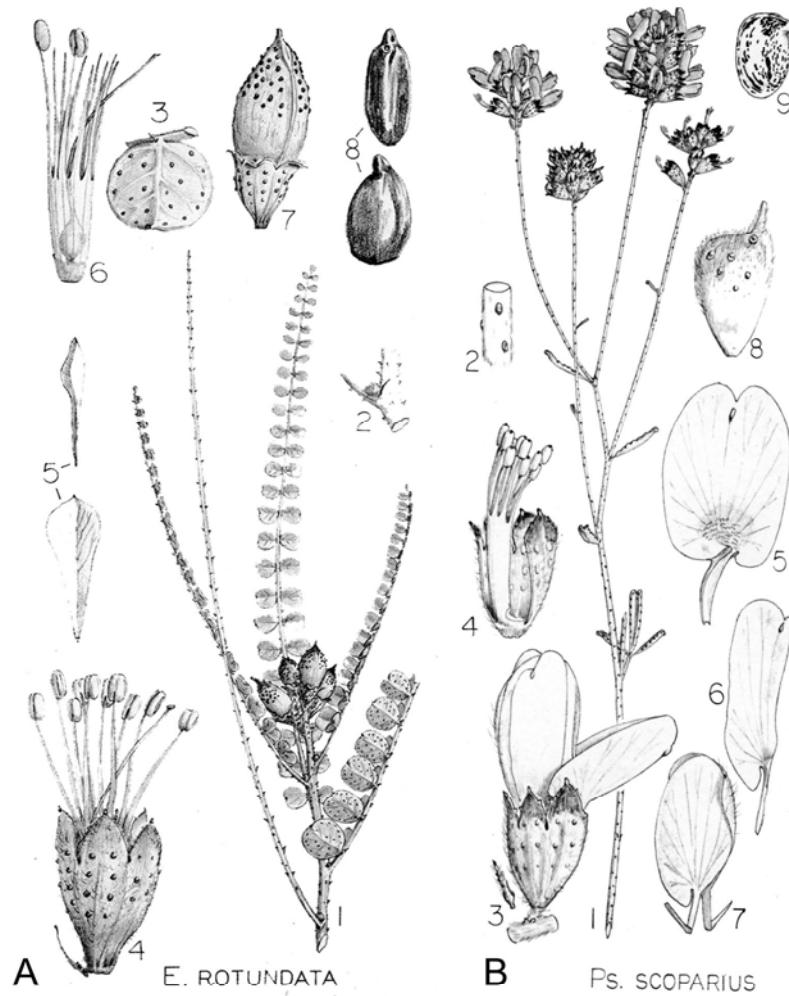
BARNEBY, R. C. 1977. *Dalea* imagines, an illustrated revision of *Errazurizia* Philippi, *Psorothamnus* Rydberg, *Marina* Liebmann, and *Dalea* Lucanus emend. Barneby, including all species of Leguminosae tribe Amorphaeae Borissova ever referred to *Dalea*. *Memoirs of the New York Botanical Garden* 27: 1–789.



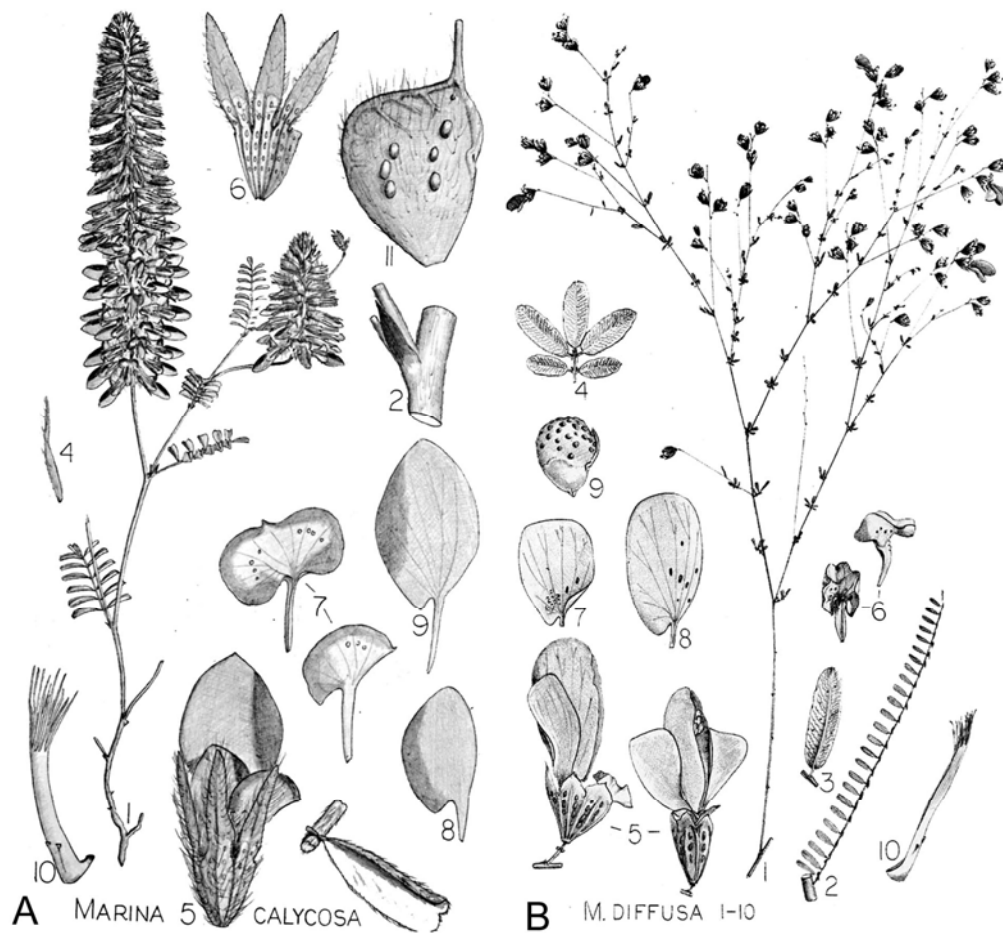
Fabaceae Figure 1. Distributions of: (A) *Errazurizia rotundata*; (B) *Marina calycosa*; (C) *Marina diffusa* (▲) and *Marina parryi* (●); (D) *Parryella filifolia*.



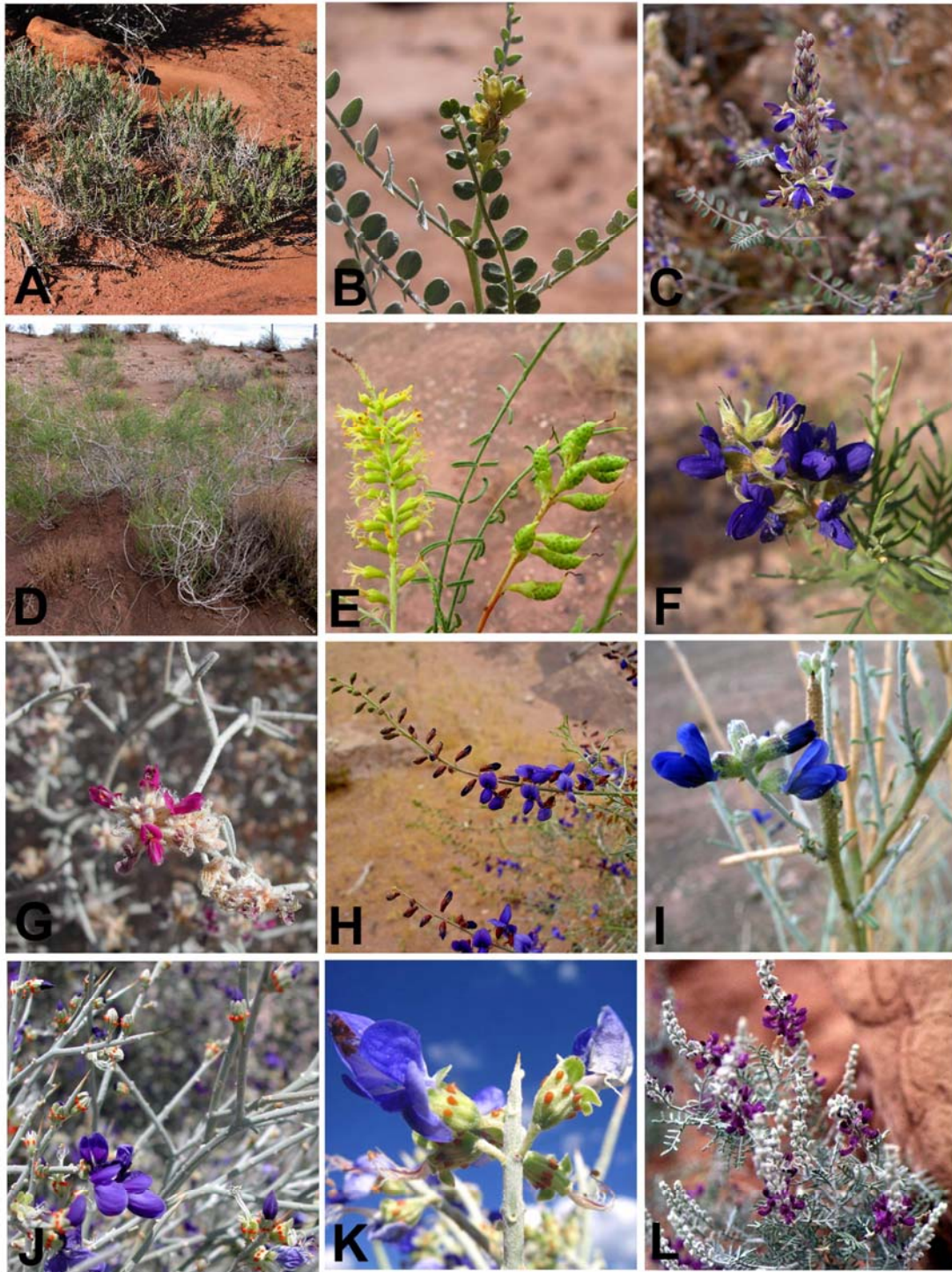
Fabaceae Figure 2. Distributions of *Psorothamnus*: (A) *P. arborescens* var. *pubescens* (▲) and *P. fremontii* (●); (B) *P. emoryi*; (C) *P. schottii* (●) and *P. scoparius* (▲); (D) *P. spinosus* (●) and *P. thompsonii* var. *whitingii* (▲).



Fabaceae Figure 3. (A) *Errazurizia rotundata*: 1) fruiting branchlet; 2) stipules; 3) leaflet, dorsal view; 4) flower + bract; 5) banner, half-profile and ventral views; 6) androecium; 7) pod; 8) seed, ventral and lateral views; (B) *Psoralea scoparius*: 1) flowering branchlet; 2) piece of stem; 3) flower + bract; 4) calyx, opened to show androecium; 5) banner, ventral view; 6) wing; 7) keel; 8) pod; 9) seed. (Reproduced with permission of the publisher from: R. C. Barneby, *Dalea Imagines*. Memoirs of The New York Botanical Garden, v. 27. © 1977, The New York Botanical Garden Press, Bronx).



Fabaceae Figure 4. (A) *Marina calycosa*: 1) fruiting stem; 2) stipules; 3) leaflet; 4) bract, lateral view; 5) flower; 6) part of calyx, from within; 7) banner, ventral and profile views; 8) wing; 9) keel; 10) androecium; 11) pod; (B) *Marina diffusa*: 1) branchlet; 2) main cauline leaf; 3) leaflet, dorsal view; 4) leaf from pannicle; 5) flower, profile and dorsal views; 6) banner, ventral and profile views; 7) wing; 8) keel; 9) pod; 10) androecium. (Reproduced with permission of the publisher from: R. C. Barneby, *Dalea Imagines*. Memoirs of The New York Botanical Garden, v. 27. © 1977, The New York Botanical Garden Press, Bronx).



Fabaceae Figure 5. *Errazurizia rotundata*: (A) habit; (B) flowers; *Marina parryi*: (C) flowers; *Parryella filifolia*: (D) habit; (E) flowers and fruit; *Psorothamnus arborescens*: (F) flowers; *Psorothamnus emoryi*: (G) flowers; *Psorothamnus fremontii*: (H) flowers; *Psorothamnus scoparius*: (I) flowers; *Psorothamnus spinosus*: (J) branch tips; (K) flowers; *Psorothamnus thompsonae* var. *whitingi*: (L) flowers. (Photos A–B, L by Daniela Roth; C, F–H, J by Max Licher; D–E, I, K by Suzanne Rhodes).