ERICACEAE HEATH FAMILY

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Shrubs or small trees, pubescent or glabrous. LEAVES simple, evergreen or deciduous, alternate or rarely opposite, entire or toothed, usually petiolate, lacking stipules. INFLORESCENCES usually bracteate terminal racemes or corymbs, or solitary and axillary. FLOWERS usually perfect, actinomorphic or nearly so and hypogynous, usually pedicelate; sepals 4 or 5, distinct or shortly connate; petals 4 or 5, distinct or connate with short lobes; stamens alternate with petals, the anthers dehiscing by terminal pores, usually awnless or with awn-like appendages called spurs (*Arctostaphylos*, *Vaccinium*); pistil 1, the ovary mostly 4 or 5 locular with axile placentation, superior or sometimes inferior (*Vaccinium*); style 1; stigma 1, capitate. FRUITS usually berries or drupes, or sometimes capsules (*Phyllodoce*) with many seeds. x = 12, 13. —Ca. 100 genera and 3000 spp., worldwide, usually on acidic soils in temperate zones. Many species cultivated as ornamentals (e.g., *Rhododendron*, *Azalea*, and *Erica*) and for fruits (e.g., blueberries and cranberries - *Vaccinium*).

Only Ericaceae sensu strictu is treated here. Recent phylogenetic analysis of molecular and morphological data (Kron et al. 2002) supports the traditional classification of Ericaceae as including the Monotropaceae and Pyrolaceae, families previously treated in the *Vascular Plants of Arizona* (Haber 1992a; 1992b). When considered a single family, these groups are sometimes treated as subfamilies. For consistency, Ericaceae is treated apart from Monotropaceae and Pyrolaceae as a separate family in this flora.

1. Leaves thin, deciduous; ovary inferior; fruit a juicy berry …… ***Vaccinium***
1' Leaves leathery, evergreen; ovary superior; fruit fleshy, mealy, or a capsule ….……. 2
  2. Heath-like shrubs with needle-like leaves; corolla campanulate; anthers awn-less; fruit a capsule …… ***Phyllodoce***
  2' Shrubs or trees with broad, flat leaves; corolla urceolate; anthers awned; fruit a berry or drupe ……. 3
    3. Trees of southeastern Arizona; fruit a berry with papillate surface ……. ***Arbutus***
    3' Shrubs widespread; fruit a berry-like drupe with smooth surface … ***Arctostaphylos***

Arbutus L. Madrone

Trees to 15 m tall, or sometimes shrubs, with checkered or smooth reddish bark. LEAVES simple, alternate, evergreen; blades leathery; margin serrate to entire; petioles reddish; stipules absent. INFLORESCENCES terminal racemes or few-branched panicles with ovate bracts. FLOWERS perfect, actinomorphic; sepals 5-lobed; corolla white to pinkish, bell-shaped or urceolate; stamens 10, included;

filaments from a swollen base and nectary disc, dilated, hairy at base; anthers awned; ovary superior; style simple, columnar, capitate. FRUITS berries, pappillose-roughened, with 15–25 seeds. —Ca. 20 spp. in N. Amer., C. Amer., and w Eur. (Latin name for *A. unedo*, strawberry tree).

Arbutus arizonica (A. Gray) Sarg. (of Arizona). Arizona Madrone. —Trees and sometimes shrubs; trunks with checkered gray bark; branches with smooth reddish bark. LEAVES lanceolate to elliptic, 5–12 cm long, 1.5–3.5 cm wide; blades light green, glossy above, pale green below, glabrous; bases rounded to cuneate; tips acute to rounded. FLOWERS pedicellate; sepals 2–2.5 mm long, lobed with membranous margins; corollas 6–8 mm long. FRUITS 8–10 mm in diameter, semi-fleshy, orange, edible (Fig. 2A). —Canyon bottoms and hillsides in oak-pine zone: Cochise, Graham, Pima and Santa Cruz cos. (Fig. 1A); 1200–2500 m (4000–8200 ft.); May–Jun; se AZ and sw NM to Jal. and S.L.P., Mex.

Arctostaphylos Adans. Manzanita, Bearberry

Shrubs erect or prostate and mat-forming; bark usually reddish-brown, smooth. LEAVES simple, evergreen, leathery; margins usually entire. INFLORESCENCES terminal simple or few-branched racemes or dense panicles. FLOWERS perfect, actinomorphic; sepals imbricate and distinct; corollas white to pink; stamens 10, included; anthers spurred; filaments dilated, hairy. FRUITS berry-like drupes, fleshy. —50–60 spp., mostly N. Amer., one circumboreal. (Greek *arctos*, bear, and *staphyle*, a bunch of grapes, fruits of *A. uva-ursi* eaten by bears).

1. Shrubs low, creeping and mat-forming, less than 1 m tall; leaves spatulate …. ***A. uva-ursi***
1' Shrubs erect, usually more than 1 m tall; leaves elliptic to ovate …….. 2
  2. Calyx, pedicels, and new twigs pilose, with glandular, spreading hairs …... ***A. pringlei***
  2' Calyx, pedicels, and new twigs puberulent to glabrous …… 3
    3. Axis of the inflorescence finely glandular puberulent to subglabrous; inflorescence a panicle …...……..…….…… ***A. patula***
    3' Axis of the inflorescence densely white puberulent; inflorescence a raceme ……. …….. ***A. pungens***

Arctostaphylos patula Greene (outspread, referring to the branches). Greenleaf Manzanita. —Shrubs with rigid, spreading branches, the lower ones rooting and forming low thickets, (0.3) 1–2 m tall; bark reddish brown, smooth; branchlets glandular pubescent. LEAVES mostly orbicular to narrowly elliptic; blades 1.2–4 cm long, 1.5–4 cm wide, bright green, shiny, glabrous; bases rounded to truncate; tips obtuse to acute; petioles 7–15 mm long, pubescent (Fig. 3). INFLORESCENCES dense panicles, glandular puberulent to subglabrous; bracts acuminate, 1–4 mm long. FLOWERS 5–8 mm long; sepals with ovate lobes 2 mm long, glabrous; corollas white to pink, urceolate; pedicels 2–8 mm long, glabrous; ovary glabrous. FRUITS depressed globose, 8–12 mm wide, dull orange to brown, glabrous. 2*n* = 26. [*A. platyphylla* (A. Gray) Kuntze, *A. pungens* Kunth var. *platyphylla* A. Gray, *A. parryana* Lemmon var. *pinetorum* (Rollins) Wiesl. & B.

Schreib., *A. pinetorum* Rollins]. —Open forests, often in ponderosa pine savannah, pinyon-juniper woodlands: Coconino, Mohave, and Navajo cos. (Fig. 1A); 1900–2700 m (6300–8900 ft); Mar–Jul; n AZ, Baja C. Norte to WA, e to MT, CO.

Arctostaphylos pringlei Parry (after C.G. Pringle). Pringle Manzanita. —Shrub, 0.2–0.5 m tall; bark reddish brown, smooth; branchlets densely glandular hairy. LEAVES lance-elliptic to ovate; 2–5 cm long, 1–3 cm wide, gray green, glaucous to finely glandular; bases rounded to truncate; tips obtuse to acute; margins entire; petioles 5–10 mm long, glandular hairy (Fig. 3). INFLORESCENCES simple or one-branched racemes, densely glandular hairy; bracts 6–10 mm long, lanceolate, acuminate, pink (Fig. 4A). FLOWERS 6–9 mm long, finely glandular hairy; sepals narrowly lanceolate, glandular hairy; corollas pink to white, urceolate; pedicels 5–10 mm long, glandular-pubescent; ovaries glandular hairy. FRUITS ovoid to globose, 6–10 mm wide, red (Fig. 2B). 2*n* = 26. —Dry, rocky hills with interior chaparral and pinyon-juniper and cypress woodlands: all cos. except Apache, La Paz, and Yuma (Fig. 1B); 1200–2000 m (4000–6600 ft.); Apr–May; s CA, n Baja C. to s NV, sw UT.

Arctostaphylos pungens Kunth (terminating in a sharp point). Point-leaf Manzanita, Mexican Manzanita. —Shrubs with rigid, spreading branches, 1–2 m tall; bark reddish brown, smooth; branchlets densely pubescent. LEAVES elliptic to lance-elliptic; blades 1.5–4 cm long, 0.5–2 cm wide, pale green, lustrous, glabrous; bases acute to rounded; tips acute and mucronate; margins entire (young leaves may be toothed); petioles 4–9 mm long, white-puberulent (Fig. 3). INFLORESCENCES simple or few-branched racemes, densely white puberulent; bracts acuminate, 1.5–4 mm long (Fig. 4B). FLOWERS 2–8 mm long; sepals with ovate lobes, reflexed, 1–2 mm long, glabrous; corollas white to pink, urceolate; pedicels 2.5–6.5 mm long, glabrous; ovaries glabrous. FRUITS depressed-globose, 5–11 mm wide, orange to brownish-red, glabrous. 2*n* = 26. —Rocky hillsides with interior chaparral and openings in ponderosa pine savannah: all cos. except Apache, La Paz, and Yuma (Fig. 1C); 1000–2500 m (3300–8200 ft); Feb–Jun; Mex. and TX, n to NV, UT.

Arctostaphylos uva-ursi (L.) Spreng. (bear-grape). Bearberry, kinnikinnik. —Prostrate shrubs, 0.1–0.2 m tall, with branches trailing along the ground, rooting and forming mats; branchlets glabrous to puberulent. LEAVES oblanceolate to obovate; blades 1–2.5 cm long, 0.3–1 cm wide, dark green above, light green below, glabrous; bases wedge-shaped; tips rounded, not mucronate; margins entire; petiolate 2–5 mm long, glandular (Fig. 3). INFLORESCENCES simple or few-branched racemes, densely puberulent; bracts acuminate, 1.5–4 mm long. FLOWERS 4.5–8 mm long; sepals with reflexed lobes, 1–2 mm long; corollas white to pink, 4.5–8 mm long, urceolate; ovaries glabrous. FRUITS depressed globose, 6–12 mm wide, bright red, glabrous. 2*n* = 26. [*A. uva-ursi* var. *adenotricha* Fernald & J. F. Macbr., *A. adenotricha* (Fernald & J. F. Macbr.) A. Löve, D. Löve, & B. M. Kapoor, *Arbutus uva-ursi* L.]. —Ground cover under coniferous forests in dry to moist sites: Apache Co. (Fig. 1B); 2300–3000 m (7600–9900 ft); May–Aug; Lukachukai Mts in AZ, circumboreal.

Phyllodoce Salisbury Mountain Heather

Shrubs densely branched, evergreen; branches glandular-glabrous. LEAVES linear, needlelike, revolute, leathery, crowded and sessile. INFLORESCENCES terminal umbellate racemes. FLOWERS perfect, actinomorphic; sepals 5-lobed; corollas bell to urceolate, 5-lobed; pedicels bracteate; stamens 10; anthers elongate, awnless; ovaries superior, 5-celled; styles filiform, capitate. FRUITS septicidal capsules with many seeds. —Ca. 7 spp., circumboreal. (Greek: a sea nymph).

Phyllodoce empetriformis (Smith) D. Don (similar to *Empetrum*; Fig. 5). Red Mountain Heather. —Shrubs, low, mat forming, decumbent and rooting. LEAVES 6–12 mm long. FLOWERS sepals less than 2.5 mm long; corollas 5–9 mm long, red to rose colored; pedicels 1–2.5 mm long. FRUITS 3–4 mm in diameter, globose. 2*n* = 24. —Known in AZ only from one historical collection (June, 1928) from the Grand Canyon, Yaki (South Kaibab) Trail (*McKee 1108* US). It was not relocated in a 1984 search (Phillips et al.1987). Subalpine meadows (typically): Coconino Co. (Fig. 1D); 1500–2700 m (5000–8900 ft.); Jul–Aug; AK to Alberta, Can., s to CA, CO. This plant may be extinct in Arizona; therefore, field botanists working in the state are urged to report on individuals or populations if located.

Vaccinium L. Blueberry

Shrubs openly branched. LEAVES deciduous, alternate; margins entire or serrulate, short petiolate. INFLORESCENSES solitary in leaf axils. FLOWERS perfect, actinomorphic; sepals 5-lobed or fused, glabrous; corollas shallowly 5-lobed, white to pinkish, pedicellate; stamens 10, usually included at the base of the corolla; anthers dehiscing terminally, with a pair of spurs; ovaries inferior, 5-celled; styles slender. FRUITS berries with many seeds. —400 spp., worldwide, temperate, subtropical and tropical montane regions. (Latin: *bacca* for berry).

Vaccinium myrtillus L. (little myrtle; Fig. 6). Blueberry, whortleberry. —Shrubs openly branching and forming open colonies from woody rhizomes, 10–40 cm tall; branches bright green, glabrous, sharply angled, flexuous. LEAVES simple, ovate to elliptic, 1–4 cm long, 7–16 mm wide, thin, glabrous or with scattered glandular hairs; tips acute. INFLORESCENCES solitary in leaf axils of current year's growth. FLOWERS 2–4 mm long; sepals glabrous, the lobes none to obscure; corollas white or pink; filaments glabrous; anthers awned. FRUITS berries, 5–9 mm wide, blue or blue-black. 2*n* = 24, 48. [*V. myrtillus* var. *oreophilum* (Rydb.) Dorn, *V. oreophilum* Rydb.]. —Mixed coniferous and spruce-fir forest, hillsides, openings: Apache, Cochise, Coconino, Graham cos. (Fig. 1D); 2400–3400 m (7900–11,000 ft); Jun–Jul; se AZ and NM, n to Can., temperate Northern Hemisphere.

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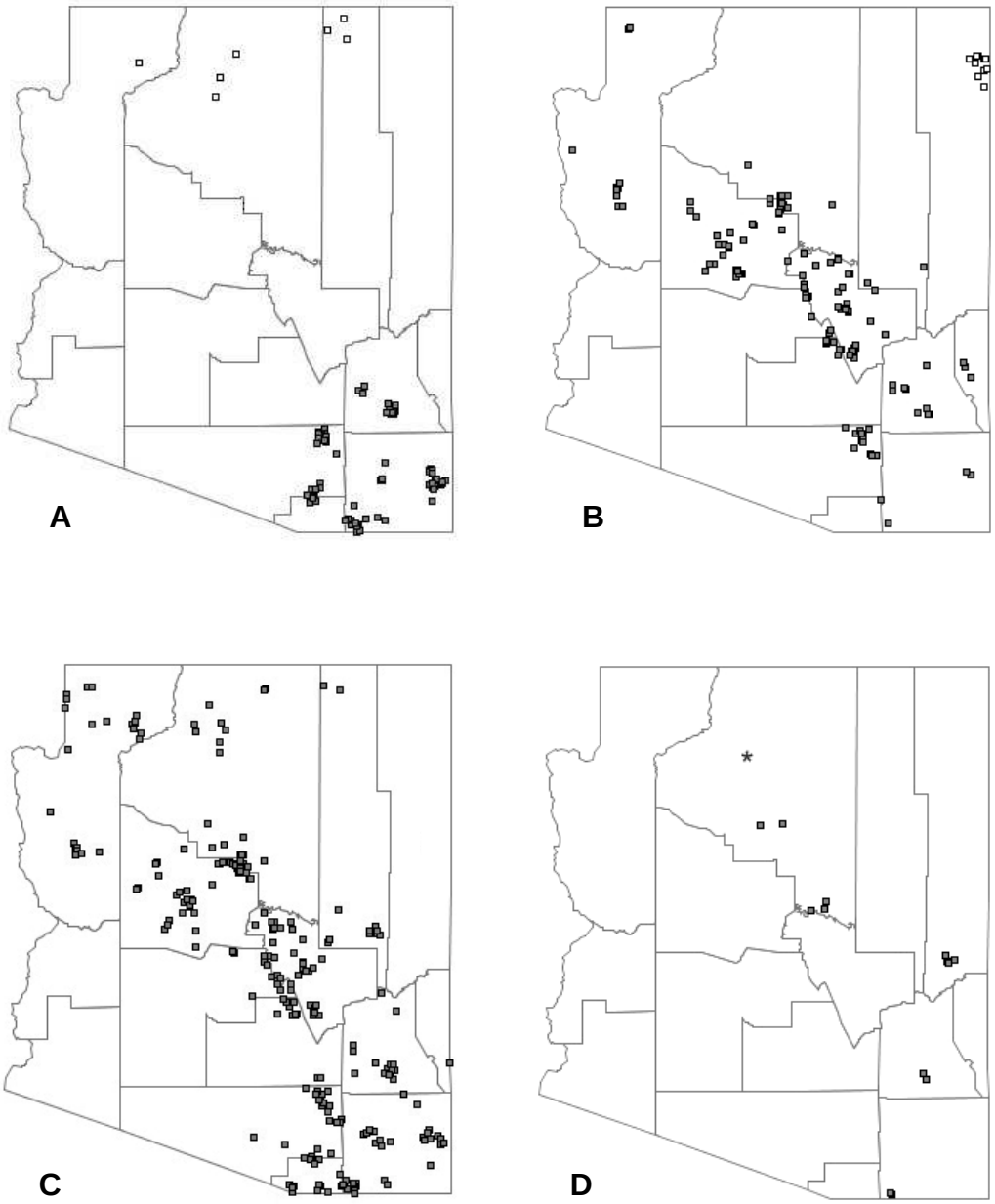
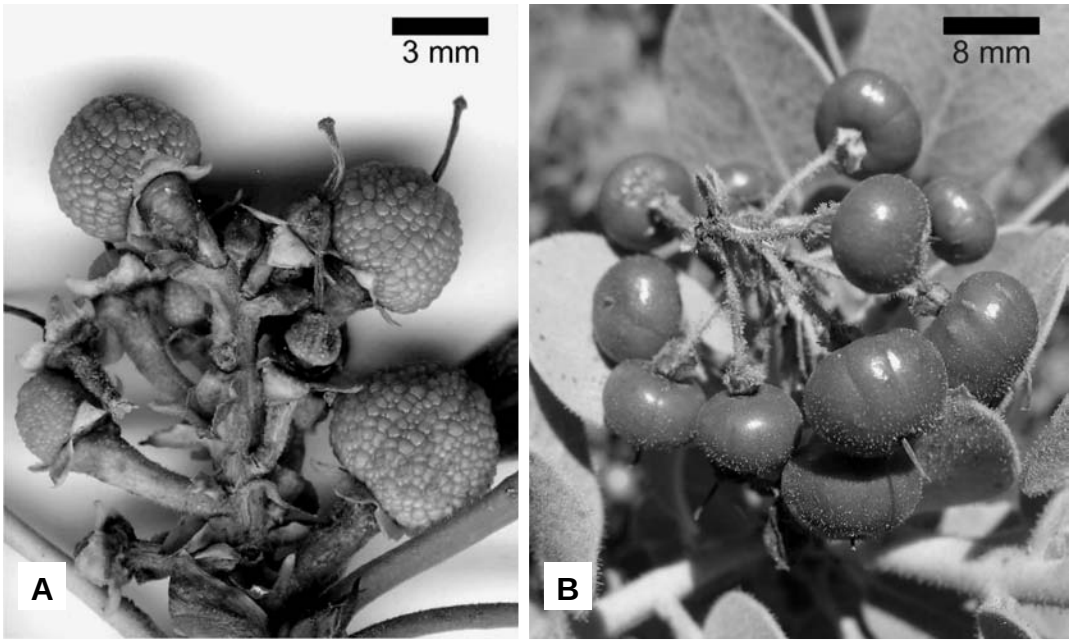
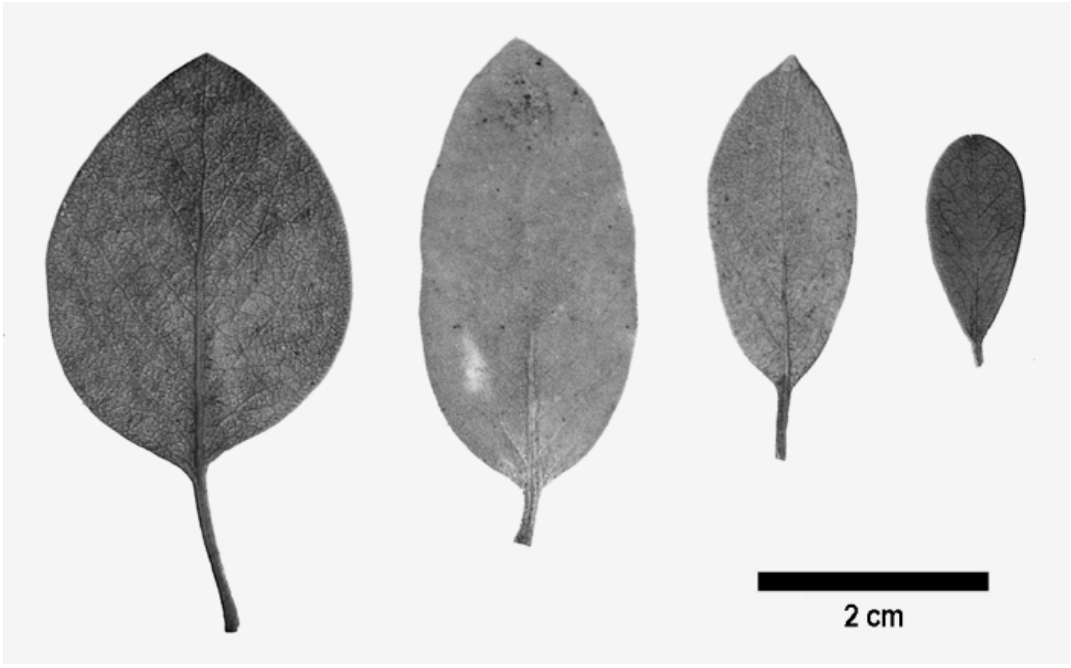


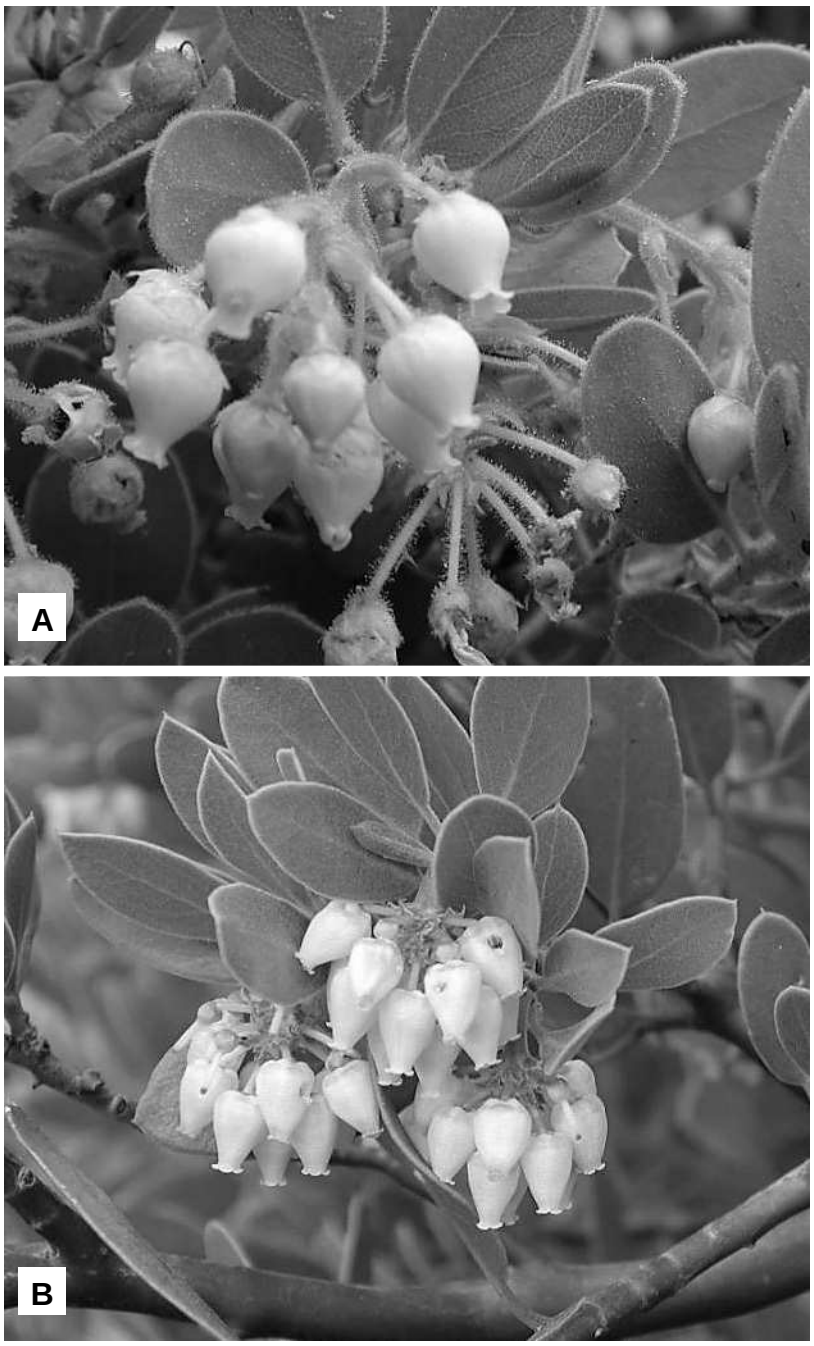
Ericaceae Figure 1. Distributions of: (A) *Arbutus arizonica* (solid squares) and *Arctostaphylos patula* (open squares); (B) *Arctostaphylos pringlei* (solid squares) and *Arctostaphylos uva-ursi* (open squares); (C) *Arctostaphylos pungens*; (D) *Phyllodoce empetriformis* (asterisk) and *Vaccinium myrtillus* (solid squares).



Ericaceae Figure 2. Comparison of fruits: (A) *Arbutus arizonica* (berry with a papillate surface); (B) *Arctostaphylos pringlei* (berry-like drupe with a smooth surface) - (*images courtesy of L.R. Landrum*).



Ericaceae Figure 3. Comparison of *Arctostaphylos* leaves (from left to right): *A. patula* (*Halvorson 304*, ASU); *A. pringlei* (*Lehto et al. 11276*, ASU); *A. pungens* (*Landrum 5115*, ASU); *A. uva-ursi* (*Reeves 8193*, ASU) - (*image courtesy of S.T. Bates and L.R. Landrum*).



Ericaceae Figure 4. Comparison of *Arctostaphylos* inflorescences: (A) *A. pringlei* (note the glandular hairs, particularly visible on the flower pedicels and leaf petioles, and the nearly obtuse leaf tips); (B) *A. pungens* (note the glabrous to puberulent flower pedicels and leaf petioles as well as the acute mucronate leaf tips) - (*image courtesy of M. Licher*).

Ericaceae Figure 5. *Phyllodoce empetriformis* (*Cooke et al. 2396, Olympic National Park, Clallam Co., Washington*, ASU) - (*image courtesy of S.T. Bates and L.R. Landrum*).

Ericaceae Figure 6. *Vaccinium myrtillus*: (A) flowering branch; (B) leaf; (C) pistil and calyx; (D) corolla; (E) flower after removal of corolla (showing stamens with appendages) - (*image: 'Plate 39', drawn by C. F. Newall in* Trees and Shrubs of the British Isles, native and acclimatised, *by C. S. Cooper and W. P. Westell, published by E. P. Dutton & Co., New York, 1909*).