

PORTULACACEAE PURSLANE FAMILY

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Deaver Herbarium

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Annual or perennial herbs. Stems simple or branched, prostrate to erect. Leaves cauline and opposite or alternate, or all basal, often fleshy; stipules present as axillary hairs or absent. Inflorescences racemose or cymose, terminal or axillary, or flowers solitary; bracts present or absent. Flowers actinomorphic, perfect; pedicellate or sessile; sepals 2 (5-9); petals 5-18; stamens 1-many; ovary superior or inferior (in *Portulaca*), of 1-many fused carpels, 1-celled; placentation basal or free central. Fruit a 1 to many-seeded capsule, splitting at apex by 2-3 valves or circumsessile. Seeds smooth or sculptured. –Ca. 30 genera, 500 spp., cosmopolitan, especially W North America. Some genera are cultivated as ornamentals (*Lewisia*, *Portulaca*); leaves of a few species can be eaten as greens or pot herbs; roots of *Lewisia* were historically used as a starchy staple (Moerman 1998).

- 1. Ovary wholly or partially inferior, capsule circumsessile near middle

.....*Portulaca*

- 1' Ovary superior, capsule of 2-3 valves or circumsessile from base.

- 2. Plants perennial arising from a flesh taproot, leaves in a tight basal

rosette.....*Lewisia*

- 2' Plants annual or perennial from corms, rhizomes or stolons, leaves both basal and cauline.

- 3. Sepals mostly deciduous, plants perennial.

4. Leaves flat.....*Talinum*

- 4' Leaves round.....*Phemeranthus*
- 3' Sepals persistent, plants annual or perennial
5. Cauline leaves opposite or absent, plants annual or perennial.
6. Inflorescence subtended by perfoliate to linear bracts, cauline leaves generally 2, plants annual or perennial.....*Claytonia*
- 6' Inflorescence bractless, cauline leaves generally more than 4, plants perennial.....*Montia*
- 5' Cauline leaves alternate, plants annual.
7. Inflorescence a simple elongate raceme, petals red to purple, capsules 3-valved.....*Calandrinia*
- 7' Inflorescence a panicle of umbellate clusters, petals white to pink, capsules 2-valved (3-valved in *C. ambigua*).....*Cistanthe*

Calandrinia Kunth.

Allison Bair

Annuals. STEMS branched, several to many, prostrate to erect. LEAVES alternate, linear to spatulate, entire, succulent. INFLORESENCE an elongated raceme, bracts leaf-like. FLOWERS few to many, pedicellate; sepals 2, ovate; petals 5, red to purple, rarely white; stamens 3-15. FRUIT a capsule, valves 3. SEEDS ovate to elliptic, black, smooth to finely reticulate. --Ca. 14 species in the temperate western Americas. (Named after J. L. Calandrini, 1703-1758, Swiss botanist).

Calandrinia ciliata Ruiz & Pav. (ciliate-leaved). Red Maids. --Herbs to 30 cm tall, from slender to thick taproot. STEMS spreading, prostrate to ascending. LEAVES linear to oblanceolate, up to 10 cm, glabrous or ciliate. FLOWERS 2-15; pedicels 4-13 mm long; sepals 2.5 – 8.0 mm long; petals 4-11 mm long, red to purple. SEEDS 5 – 20, elliptic, finely reticulate, 1 – 2.5 mm. --Sandy to loamy soil, sand and gravel washes, rocky slopes; Cochise, Gila, Graham, Maricopa, Mojave, Pima, Pinal, Santa Cruz, Yavapai cos., 425-1550 m (1400 - 5100 ft); February - June; CA, OR, WA, western Mexico, Guatemala, northwestern South America.

Cistanthe Spach Pussy Paws

Allison Bair

Annual, biennial, or perennial herbs. STEMS simple or branched, spreading to ascending or erect. LEAVES in basal rosette or basal and cauline, linear to spatulate, entire, generally succulent. INFLORESCENCE racemose, generally one-sided; bracts present. FLOWERS few to many, pedicellate or sessile, each subtended by two unequal bracts; sepals ovate, scarious or scarious-margined; petals 2-12; stamens 1-23; styles present or absent; stigmas 2-3, sessile or stalked. FRUIT a capsule, valves 2-3. SEEDS one to many, elliptic to round, black, smooth to sculptured. --Ca. 35 species distributed from North to South America.

Spach (1836) described the genus *Cistanthe* to accommodate several Chilean species that he segregated from *Calandrinia*. Recent cladistic investigations (Hershkovitz, 1991) indicate that many other species also belong in *Cistanthe*. These include the Arizona species formerly recognized as *Calandrinia ambigua*, *Calyptridium monandrum*, and *Calyptridium parryi*.

1. Basal rosette absent; flowers pedicellate; capsule 3-valved.....***C. ambigua***
- 1' Basal rosette well-developed (although withering at anthesis); flowers sessile; capsule 2-valved.....2.

2. Sepals 1.5-5 mm long; capsules not more than twice as long as sepals.....

.....*C. parryi*

2' Sepals 1-3 mm long; capsules two and a half or more times as long as sepals.....

.....*C. monandra*

Cistanthe ambigua (S. Watson) Carolin ex M. Hershkovitz. (of uncertain relationship). Desert pussypaws. --Annual herbs to 10 cm tall. STEMS spreading to erect. LEAVES all cauline, linear to spatulate, 1.5-5 cm long. INFLORESCENCE a panicle of umbellate clusters, up to 4 cm, bracts leaf-like. FLOWERS pedicellate; pedicels 1-5 mm; sepals scarious-margined, ovate, 2.5-5 mm long; petals 3-5, white, 2-5 mm long; stamens 5-10; stigmas 3, stalked. FRUIT valves 3, ovoid, 3-6 mm long, equal to or less than length of calyx. SEEDS 6-15, black, smooth, shiny. [*Calandrinia ambigua* (S. Wats.) T.J. Howell]. --Sand and gravel washes, rocky slopes, in desert shrub communities; La Paz, Mojave, Yuma Cos., 0 – 500 m (0 – 1700 ft); February - May; CA, Mexico.

Cistanthe monandra (Nutt.) M. Hershkovitz. (one-stamened). Common pussypaws. --Annual herbs to 16 cm tall. STEMS spreading to ascending. LEAVES in an ephemeral basal rosette, spatulate, up to 7.5 cm long. INFLORESCENCE a 1-sided raceme, up to 3.5 cm; bracts ovate to elliptic. FLOWERS sessile; sepals scarious or scarious-margined, ovate, 1-3 mm long; petals 3, white to pinkish, 1-3 mm long; stamen 1; styles absent; stigmas 2, sessile. FRUIT valves 2, ovoid to cylindric, 2.5- 8 mm long, two and a half or more times as long as sepals. SEEDS 1-10, black, smooth, shiny. [*Calyptridium monandrum* Nutt.] --Sand and gravel washes, rocky slopes, roadsides; Cochise, Gila, Graham, Maricopa, Mojave, Pima, Pinal, Yavapai, Yuma cos., 400 – 1550 m (1400 – 5000 ft); February - May; CA, NV, Mexico (Baja California).

Cistanthe parryi (A. Gray) M. Hershkovitz. (honoring collector Charles Parry (1823 - 1890), surgeon and naturalist on Mexican Boundary Surveys). Parry's pussypaws. --Annual herbs to 10 cm tall. STEMS spreading to ascending. LEAVES in an ephemeral basal rosette, spatulate, up to 7.5 cm long. INFLORESCENCE a 1-sided raceme, up to 4.5 cm; bracts ovate to elliptic. FLOWERS sessile; sepals scarious or scarious-margined, ovate, 1.5-5 mm long; petals 3, white to pinkish, 1.5-3 mm long; stamens 1-3; styles absent; stigmas 2, sessile. FRUIT valves 2, ovoid to cylindric, 2-8 mm long, not more than twice as long as sepals. SEEDS 5-15, black, tuberculate to smooth, dull to shiny. --4 vars., 1 in AZ; CA to UT and AZ.

var. **arizonica** (J.T. Howell) Kartesz & Gandhi (from Arizona). Arizona Pussypaws. --Seeds smooth, shiny. [*Calyptridium parryi* Gray var. *arizonicum* J.T. Howell]. --Sand and gravel washes, open areas; Graham, Pima, Pinal, Yavapai cos., 800 – 1300 m (2600 – 4200 ft); February - May; CA, Mexico (Baja California).

Claytonia L. Spring beauty

Marissa Howe

Annuals or perennials from corms or taproots. STEMS simple or branched, erect. BASAL LEAVES none to many, entire; cauline leaves 2, opposite, free to fully fused into a perfoliate disk, margins entire or cleft, sometimes apiculate. INFLORESCENCE a stalked or sessile raceme or cyme, dense or open; bracts present, minute. FLOWERS 1 – 28, sepals 2, ovate; petals 5, pink or white; stamens 5. FRUIT a capsule, valves 3. SEEDS lens-shaped, brown to black and shiny. --Ca. 26 species distributed from North America to East Asia. Corms of *C. lanceolata* var. *rosea* and leaves of *C. parviflora* and *C. perfoliata* are edible (Moerman 1998). (Commemorates John Clayton, 1694-1773, plant collector).

1. Perennials with corms; basal leaves none to few, cauline leaves free.

.....*C. lanceolata*

1. Annuals with fibrous roots; basal leaves few to many; cauline leaves free, or fused and perfoliate.

2. Basal leaves linear to narrowly lanceolate, base tapered gradually to petiole, petals 2.5 – 5.0 mm long.....*C. parviflora*

2. Basal leaves ovate, deltate or rhomboidal, base truncate to cordate, petals 1.0 - 1.8 mm long.....*C. perfoliata*

Claytonia lanceolata Pursh (lance-shaped). Western Spring Beauty. -- Erect perennial herbs to 21 cm tall, arising from a spherical corm, 0.8 – 2.6 cm wide. BASAL LEAVES none to few; ovate to lanceolate, cauline leaves usually 2, sessile to short petiolate, linear to narrowly lanceolate. INFLORESCENCE a short simple or branched raceme or cyme. FLOWERS 1-9, sepals 2.7 – 8.0 mm long; petals 5 – 20 mm long, smooth at tip, white or pink (base sometimes yellow). SEEDS 2.2 – 2.5 mm, black. Widespread in woodlands and meadows throughout western North America.

var. **rosea** Rydberg (rose-colored). --Basal leaves 1-2 attached to corm, ovate to lanceolate, 3.1 – 13.8 cm long, 0.6-1.8 cm wide; INFLORESCENCE subtended by a leafy bract with minute upper bracts in the inflorescence reduced to membranous scales. FLOWER petals 5-16 mm long. [*Claytonia rosea* Rydberg]. -- Ponderosa pine and pinyon-juniper forests in moist soil, often near the Mogollon Rim; Coconino, Gila, Maricopa, Mojave, Navajo, Yavapai cos., 1300-2300 m (4200–7500 ft); Feb-May; CO, MT, NM, UT, Western Canada.

The Arizona specimens are all referred to *Claytonia lanceolata* var. *rosea*. In some recent floristic treatments (Weber 1990, Miller 2003) this taxon was elevated to *C. rosea* and separated from *C. lanceolata* based on the presence of basal leaves (vs. absent in *C. lanceolata*), multiple minute bractlets within the inflorescence (vs. bractlets absent in *C. lanceolata*), and petal length 8-10 mm (vs. 5-20 mm in *C. lanceolata*).

Of these three characters, only the presence of basal leaves distinguishes the Arizona specimens as a distinct taxon, recognized here as a geographical variety. Basal leaves originate from the corm, so when the corm is absent from herbarium specimens the basal leaves are absent or disconnected. Thus lack of basal leaves is a reflection of the quality of the collection (i.e., whether the specimen was dug up vs. pulled up). Out of the 32 specimens examined that had corms, only 4 were missing basal leaves. The presence of minute bractlets within the inflorescence may not be a good delimiting character. Bractlets are present in specimens of *C. lanceolata* from Wyoming (Rominger 2448–ASC), well north of the range of *C. lanceolata* var. *rosea*. Petal length in the AZ specimens showed more variation than that of typical *C. lanceolata* var. *rosea* (5-16 mm vs. 8-10 mm). *Claytonia lanceolata* var. *rosea* needs experimental work to substantiate its recognition at the specific level.

Claytonia parviflora Douglas ex Hooker (small flowers). Streambank springbeauty.

--Annual herbs to 15 cm tall, spreading to erect. BASAL LEAVES linear to narrowly oblanceolate, 1.9 – 12.8 cm long, 0.1 – 4 cm wide, tapering gradually to petiole; cauline leaves 2, free, or fused into a perfoliate disk with margins entire, sometimes with 2 apiculate or mucronate tips. INFLORESCENCE a stalked or sessile raceme, dense or open, subtended by a single, often obscure bract. FLOWERS 3 –19, sepals 1.0 – 2.5 mm long; petals 2.5 – 5 mm long, oblong, notched at tip; pink or white. SEEDS 1.0 – 1.5 mm, black. --4 subspp., 3 in AZ; w North America.

Based upon Miller's treatment for Flora North America (2003) and annotated herbarium specimens, three subspecies of *Claytonia parviflora* have been recognized in Arizona. Subspecies *viridis* is morphologically distinct from the others because its cauline leaves are free vs. perfoliate as in the other two subspecies. Subspecies *parviflora* and *utahensis* seem to be distinct only in their respective geographic ranges. Subspecies *utahensis* is found north of the Mogollon Rim, whereas subsp. *parviflora* is found south of the Mogollon Rim. We observed a large amount of variability in basal leaf shape, which, according to Miller, delimits these subspecies (see key below).

1. Cauline leaves free.....**subsp. *viridis***

1. Cauline leaves fused.

2. Basal leaves linear to narrowly oblanceolate; plants found above the Mogollon

Rim.....**subsp. *parviflora***

2. Basal leaves narrowly oblanceolate to spatulate; plants found below the Mogollon

Rim.....**subsp. *utahensis***

subsp. **parviflora** Douglas ex Hooker --BASAL LEAVES linear to narrowly oblanceolate, 6.3 – 12.8 cm long, 0.15-1 cm wide; cauline leaves fused and perfoliate, FLOWERS 4 – 14, sepals 1.2 – 2.5 mm, petals 2.5-3 mm, pink or white. SEEDS 1.2-1.5 mm. $2n = 24, 36, 48$. [*Claytonia perfoliata* var. *parviflora* Douglas ex Hooker, *Montia perfoliata* var. *parviflora* Douglas ex Hooker, *Montia perfoliata* forma *parviflora* Douglas ex Hooker]. --Moist areas; Gila co., 800-1050 m (2600-3500 ft); Mar-May; CA, ID, MT, NV, OR, UT, WA; British Colombia, Mex. This subspecies may intergrade with other species of *C. perfoliata* complex (Miller 2003).

subsp. **utahensis** (Rydberg) J. M. Miller & K. L. Chambers (of the Utah region). Mojave Indian Lettuce. --BASAL LEAVES narrowly oblanceolate to spatulate, 2.2-12.4 cm long, 0.6-4 cm wide; cauline leaves fused and perfoliate. FLOWERS 6-19, sepals 1-2.3 mm long; petals 3-3.5 mm long; white. SEEDS 1.0-1.5 mm. [*Limnia utahensis* Rydberg, *Claytonia perfoliata* var. *utahensis* Rydberg, *Montia utahensis* Rydberg]. -
-Moist areas; Coconino, Mojave, Yavapai cos., 900-1200 m (3000-3900 ft); Mar-Apr; CA, NV, Mex.

subsp. **viridis** Davidson (green). Davidson's Indian Lettuce. BASAL LEAVES linear to narrowly oblanceolate, 1.9-9.1 cm long, 0.1-0.5 cm wide; cauline leaves free. FLOWERS 3-9; sepals 1.9-2.5 mm long;

petals 2.8-5 mm long, white or pink. SEEDS 1.3-1.4 mm. $2n = 24, 36$. [*Montia spathulata* var. *viridis* Davidson, *Montia spathulata* var *tenuifolia* Munz]. –Decomposed granite or sandstone, northwest corner of AZ; Mojave co., 1200-1550 m (4000-5100 ft); Apr; CA, NV, Mex. This taxon intergrades with subspecies *parviflora* (Miller 2003).

Claytonia perfoliata Donn ex Willdenow (fused leaves). Miner's Lettuce. --Annual herbs to 30 cm tall, spreading to erect. BASAL LEAVES, several, narrowly oblanceolate to ovate to deltate or rhomboidal, 1.2 - 19 cm long, 0.3 – 4.5 cm wide, base abruptly tapered; cauline leaves 2, fused into perfoliate disk subtending the inflorescence, tips apiculate or mucronate, margin entire or occasionally notched or cleft. INFLORESCENCE a stalked or sessile raceme, dense or open, subtended by a single, often obscure bract. FLOWERS 5-28, sepals 1.5-4.5 mm long, ovate; petals oblong, 1.0-1.8 mm long, pink or white, notched at tip. SEEDS 1.0-1.8 mm, brown to black. [*Montia perfoliata* Donn ex Willdenow]. Moist areas, stream banks, or riparian areas in desert shrub to Ponderosa Pine/Gambel Oak habitat; Coconino, Gila, Graham, Maricopa, Mojave, Pima, Pinal, Yavapai cos., 350-2200 m (1200-7300 ft); Feb-Jun; CA, CO, ID, MT, NV, OR, UT, WA, WY, British Columbia to Central America.

Based upon annotated herbarium specimens and the recent Flora North America treatment (Miller 2003), two subspecies of *Claytonia perfoliata* have been recognized in Arizona, subsp. *intermontana* and subsp. *mexicana*. They are not recognized as distinct entities here because the characteristics used to delimit these subspecies are not consistent or are extremely difficult to see. Subspecies *intermontana* is delimited from subsp. *mexicana* by beet red or green herbage and gas pockets on the basal leaves (vs. green herbage only and no gas pockets). The best way to identify these subspecies may be by their geographical ranges (Chambers 1993, Miller 1978); subsp. *intermontana* grows in northwestern Arizona (in Yavapai and Mojave Cos.), and subsp. *mexicana* grows in central to southern Arizona. It has been suggested that the subspecies of *C. perfoliata*

may be difficult to identify due to environmental plasticity, genetic mixing among polyploids, and geographic overlap of distinct self-pollinating forms (Miller 1978).

Lewisia Pursh Bitter Root

Robin Taylor

Perennials herbs with fleshy taproots. STEMS simple or branched, prostrate to erect. LEAVES all basal, sessile or petiolate, linear to spatulate, margins entire, glabrous. INFLORESCENCE solitary or cymose, bracts present. FLOWERS 1-60, sepals 2 and green or 5-9 and petal-like, orbicular-ovate; petals 5-15, white to dark pink; stamens 5-50; styles 3-9, branched. FRUIT a capsule, circumscissile near base. SEEDS many, round, black, smooth. 16 species distributed throughout western N. America. (in honor of Meriwether Lewis, 1774-1809, of Lewis and Clark). Roots of most species were peeled and dried as a winter food (Moerman 1998).

- 1. Sepals 6-8, cream to pink; leaves ephemeral, withering before flowers

appear.....*L. rediviva*

- 1. Sepals 2, green; leaves persistent.

- 2. Bracts appearing sepal-like, closely subtending flowers; leaves 1-12 mm wide; capsules 6-9 mm

wide.....*L. brachycalyx*

- 2. Bracts leaf-like, well below flowers; leaves 0.5-4 mm wide; capsules 4-5 mm wide

.....*L. pygmaea*

Lewisia brachycalyx (G. Engelmann) A. Gray (short-sepaled). Bitter Root. --TAPROOT 1.2-9.8 cm long. STEMS prostrate to sub-erect, 0.5-4.6 cm tall. LEAVES persistent, sessile, oblanceolate, 1.5-8.2 cm long, 0.1-1.2 cm wide, base truncate, rounded at tip. INFLORESCENCE bracts sepal-like, closely subtending

the flowers. FLOWERS 2-26; sepals 2, ovate, 0.3-1.0 cm long, tip acute, margins entire; petals 5-8, white with pink veins, 0.6-2.6 cm long; stamens 9-15; styles 5-8. FRUIT 6-9 mm long. SEEDS 1-1.8 mm. –Sandy loam/sandstone slopes in conifer forests, often in streambeds; Apache, Coconino, Gila, Navajo, Yavapai cos., 1100-2300m (3,400-7,500 ft); March-June; CA, UT, Mexico.

Lewisia pygmaea (A. Gray) B.L. Robins (dwarf). Pygmy Bitter Root or Alpine Lewisia. --TAPROOT 1.0-15.0 cm. STEMS prostrate to suberect, 1.0-6.0 cm tall. LEAVES persistent, petiolate, linear to narrowly spatulate, 1.2-10.2 cm long, 0.5-4.0 mm wide, base long attenuate, acute to rounded at tip. INFLORESCENCE bracts leaf-like, positioned well below flowers. FLOWERS 1-60; sepals 2, orbicular to ovate, 0.4-1.1 cm long; petals 5-9, white to dark pink, 0.4-1.3 cm long; stamens 5-8; styles 3-6. FRUIT 4-5 mm long. SEEDS 1 mm. – Meadows and conifer forests often among oaks and ferns; Apache, Coconino, Navajo cos., 2400-3500m (8,000-11,600ft); May – August; western U. S.; Canada.

Lewisia rediviva Pursh (reviving from a dry state). Bitter Root. --TAPROOT 6.0 – 8.3 cm. STEMS prostrate to erect, 1.0-4.8 cm tall. LEAVES withering at anthesis, sessile, linear to oblanceolate, acute to rounded at tip. FLOWERS 1-7, sepals 6-8, ovate, 0.9-1.7 cm long; petals 10-15, creamy-pink, 1.0-2.2 cm long; stamens 20-50; styles 4-9. FRUIT 5-6 mm long. SEEDS 2-2.1 mm. –2 vars. in western North America, 1 in AZ.

var. **rediviva** --LEAVES linear, cylindrical, 1.0-1.4 cm long, 1.5-2 mm wide. --Found on rocky substrates in pinyon-juniper woodland; Coconino co., 1676-1850 m (5,500-6,069 ft); May-June; CA, CO, MO (western United States).

Montia L. Water chickweed

Tina Ayers

Perennial herbs with rhizomes and stolons. STEMS erect or decumbent, often rooting at nodes. LEAVES alternate or opposite, petiolate. INFLORESCENCE a 1-sided raceme, bractless above first flower. FLOWERS 2 to many, sepals ovate; petals 3-5; stamens 3-5. FRUIT a capsule, valves 3. SEEDS 1-3, black, smooth or warty. --Ca. 12 species, cosmopolitan; 8 in N. America. (for Guiseppe Monti, 1682-1760, Italian botanist).

Montia chamissoi (Ldeb.) Spreng. (etymol.). Water minerslettuce. --Stems 3-27 cm long arising from rhizomes with pink bulblets. LEAVES opposite, oblanceolate to obovate, 0.5-5 cm long, 0.1-1.7 cm wide, attenuate, tip acute to round, entire, glabrous. FLOWERS 2-14; sepals 2-3 mm long; petals 5, white to pinkish, 5-8 mm long; stamens 5. CAPSULE 2-3 mm. SEEDS warty, 1-1.5 mm. --Found in moist areas, often in wet meadows; Apache, Coconino, and Navajo cos., 2100-3000 m (7,000 – 9,500 ft); May – September; Pacific States east to the Rocky Mountains; also found in IA, MN, PA.

Portulaca L. Purslane

Daniela Roth

Annual or perennial herbs. STEMS prostrate to ascending or erect. LEAVES alternate to subopposite, short-petioled or sessile, flat, cylindrical, subterete, linear or spatulate, margins entire; hairy nodes present or absent. INFLORESCENCE typically a cyme subtended by involucreal leaves with flowers crowded at the branch ends or rarely solitary. FLOWERS perfect; sepals 2, united below, deciduous with the top of the capsule; petals mostly 5; ovary partly or wholly inferior, stamens 5 to many, stigmatic branches 2-9. FRUIT a membranaceous, circumscissile capsule. SEEDS numerous, round-reniform, tuberculate, gray, brown, or black,

often iridescent. --Ca. 125 species worldwide, mostly in the tropics and subtropics. (*portula*, latin for little door, referring to lid of capsule).

1. Lower valve of the capsule with an expanded circular membranaceous wing just below the rim.....*P. umbraticola*
1. Lower valve of capsule without membranaceous wing.
 2. Leaf nodes and inflorescence glabrous or with inconspicuous hairs. Leaves flat, obovate-cuneate or spatulate, typically more than 3 mm wide.....*P. oleracea*
 2. Leaf nodes and inflorescence with conspicuous hairs. Leaves terete to hemispheric, typically less than 3 mm wide.
 3. Petals pink to purple..... *P. pilosa*
 3. Petals yellow, orange or copper.
 4. Plants perennial, erect, petals 3 – 10 mm long, capsules 2 – 4.2 mm in diameter.....*P. suffrutescens*
 4. Plants annual, prostrate to suberect, petals 2 – 2.5 mm long, capsule 1 – 2 mm in diameter.....*P. halimoides*

Portulaca halimoides L. (possibly referring to similarity with *Halimione*, an old name for *Atriplex*).

Dwarf Purslane. --Annual herb from a slender, fibrous root. STEMS much branched, prostrate to somewhat ascending, 2-16 cm long, often reddish, glabrous. LEAVES alternate, linear, cylindrical or nearly so, 4-15 (18) mm long, 0.5-3 mm wide; nodes with conspicuous white-villous hairs. INFLORESCENCE white-villous; involucre leaves 6-8, 3-8 mm long, 0.5-3 mm wide. FLOWERS solitary or clustered at the ends of branches; sepals typically turning reddish at maturity; petals 2-2.5 mm long, yellow to copper colored; stigmatic branches

3-4. CAPSULE 1-2 mm in diameter; stipe 1-1.5 mm. SEEDS iridescent grayish or blackish at maturity, rounded or stellate tuberculate. [*Portulaca parvula* A.Gray]. --Sandy or gravelly soils, in open or brushy sites, often in disturbed places; Mohave, Coconino, Navajo, Yavapai, Yuma, Maricopa, Pima, Santa Cruz, Pinal, Cochise, Graham, Greenlee, cos., 350-2050m (1100-6800ft). March – November. MO to CO, south to TX and NM.

Portulaca oleracea L. (kitchen or pot herb). Common Purslane. --Annual herb from a taproot. STEMS prostrate to somewhat ascending with radially spreading branches, 4-25 cm long or more often reddish, glabrous. LEAVES alternate, flat, ovate-cuneate or spatulate, 10-17 mm long, 5-12 mm wide; nodes with a few inconspicuous hairs in the axils. INFLORESCENCE glabrous or with a few inconspicuous hairs, involucreal leaves 1-4, 6-20 mm long, 2-8 mm wide. FLOWERS solitary or clustered at the end of branches; petals yellowish, 2-5 mm long; stigmatic branches 3-6. CAPSULE 2-6 mm in diameter; slightly stipitate. SEEDS black, finely granulate to stellate or rounded tuberculate. [*Portulaca retusa* Engelm., *Portulaca neglecta* Mack. & Bush]. -- Found in all habitats, especially roadsides and disturbed areas; reported from all AZ cos. except LaPaz; 450 – 2400m (1400 – 7800ft). June – October. Introduced. Worldwide in temperate to warm regions; throughout the US, including AK and Canada. Young leave and stems edible raw or cooked.

Portulaca retusa Engelm. has been previously recognized as a separate species, based on seed morphological characteristics, growth habit, sepal shape, and number of stigmatic branches (Correll & Johnston 1970, W.B. McDougall 1973, Martin & Hutchins 2001, Kearney & Peebles 1960, Welsh et. al. 1993). Positive identification from herbarium specimens is only possible with mature seeds (rounded tuberculate vs. sharply echinate or stellate in *P. retusa*). Intergradation of seed morphological characteristics between the two species has also been observed. Other characteristics such as growth habit, sepal shape, and number of style lobes, previously thought to delineate *P. retusa* from *P. oleracea*, have been found highly variable (Correll & Johnston 1970, Martin & Hutchins 2001, Kearney & Peebles 1960, Welsh et. al. 1993, W.B. McDougall 1973). More

work, especially with fresh intact specimens, is needed to substantiate recognition of *P. retusa* at the specific level.

Portulaca pilosa L. (refers to long soft hairs at the nodes). Kiss Me Quick. --Annual or weak perennial herb from a fibrous root. STEMS prostrate to somewhat ascending, much branched, 3-16 cm long. LEAVES alternate, linear, cylindrical or nearly so, 3-13 mm long, 0.5-1.5 mm wide; nodes with conspicuous white-villous hairs. INFLORESCENCE white-villous; involucre leaves 6-10, 5-12 mm long, 0.5-1 mm wide. FLOWERS solitary or clustered at the ends of branches; petals reddish pink, 3-7 mm long; stigmatic branches 3-5. CAPSULES 2-5 mm in diameter; slightly stipitate. SEEDS black, stellate-tuberculate. [*Portulaca mundula* Johnst.]. --Gravelly or sandy soils, slopes and dry washes; Yavapai, Cochise, Santa Cruz cos.; 1200-1600m (4000-5200ft). April-September. MO to KS, TX, CA, NM, northern Mexico.

Portulaca pilosa can be confused with *P. suffrutescens* when not in flower. *P. suffrutescens* is stiffly erect while *P. pilosa* tends to be prostrate or only somewhat ascending. Also, the distance between leaf nodes in *P. suffrutescens* is generally longer than in *P. pilosa* (5-25 mm vs. 1-7 mm). The density of hairs in the nodes gives *P. pilosa* a more hairy appearance and the involucre hairs are whitish rather than tan or brownish. Some of these characteristics might not be apparent in young plants, plants grown under difficult conditions, or herbarium specimens.

Portulaca suffrutescens Engelm. (woody). Shrubby Purslane. --Perennial herb from tuberous thickened rootstocks. STEMS erect or ascending 10-23 cm high, somewhat suffrutescens. LEAVES alternate, sometimes subopposite, blades cylindrical, linear, 7-20 mm long, 0.5-1.5 mm wide; nodes with long hairs. INFLORESCENCE villous with conspicuous, mostly tan or brownish hairs, involucre leaves 6-10, 6-30 mm long, 0.5-2 mm wide. FLOWERS clustered at the end of branches; petals copper or orange colored, 3.2-10.1 mm long; stigmatic branches 5-6. CAPSULE 2-4.5 mm in diameter; stipe up to 1 mm. SEEDS black,

sometimes iridescent, rounded-tuberculate. [*Portulaca stelliformis* Moc. & Sesse]. --Rocky slopes, flats, grasslands, roadsides, disturbed places, and in sandy, gravelly places along streams; Yavapai, Gila, Pinal, Graham, Pima, Santa Cruz, Cochise cos.; 600-1850m (2000-6000ft). May-September. NM, TX, northern Mexico.

Portulaca umbraticola Kunth. (“umbrella-dweller” possibly in reference to the membranous wing of the capsule). Wingpod Purslane. --Annual herb from a fibrous root. STEMS prostrate to erect or ascending, 4-20 cm long, glabrous. LEAVES few, mostly alternate, sometimes subopposite, flat, lanceolate or spatulate, 10-35 mm long, 2-15 mm wide, glabrous; nodes sometimes with a few inconspicuous hairs. INFLORESCENCE glabrous, with 4-5 conspicuous involucre leaves, 10-30 mm long, 1-7 mm wide. FLOWERS clustered at the ends of branches; petals pink, purple, yellow or orange tipped with red, 5-10 mm long; stigmatic branches 5-18. CAPSULE 3-5 mm in diameter with an expanded circular membranaceous wing just below the rim; stipe 1-1.5 mm. SEEDS gray, tuberculate. AZ to NC, south to TX.

subsp. **lanceolata** Engelm. (lance-shaped leaves). --Flower diameter 8-15 mm; petals bi-colored. [*P. lanceolata* Engelm.]. --Dry sandy or rocky soils, desert grasslands, oak woodlands, wash bottoms, disturbed sites; Gila, Graham, Cochise, Santa Cruz, Pima cos., 900-1850m (3000-6000ft). June-October.

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Portulacaceae Fig. 1. A: *Calandrinia ciliata*, habit, flower, leaf; B: *Claytonia lanceolata* var. *rosea*, habit; C: *Claytonia parviflora* subsp. *viridis*, habit; D: *Claytonia perfoliata*, habit, leaf.

Portulacaceae Fig. 2. A: *Cistanthe monandra*, habit, fruit enclosed in sepals; B: *Cistanthe parryi*, fruit enclosed in sepals; C: *Lewisia pygmaea*, habit; D: *Lewisia rediviva*, habit reconstruction showing leaves that are not present with flowers; E: *Lewisia brachycalyx*, habit; F. *Montia chamissoi*, habit.

Portulacaceae Fig. 3. *Portulaca*. A: *P. suffrutescens*, habit; B: *P. umbraticola*, flowering stem; C: *P. halimoides*, flowering stem; D: *P. pilosa*, flowering stem; E: *P. oleracea*, flowering stem.

Portulacaceae Fig. 4. Distributions of: A: *Calandrinia ciliata*; B: *Claytonia lanceolata* var. *rosea*; C: *Claytonia parviflora* subsp. *parviflora* (●), subsp. *utahensis* (■), subsp. *viridis* (▲); D: *Claytonia perfoliata*.

Portulacaceae Fig. 5. Distributions of: A: *Cistanthe ambigua* (▲), *C. monandra* (●), *C. parryi* (*); B: *Lewisia brachycalyx* (●), *L. pygmaea* (■), *L. rediviva* (▲); C: *Montia chamissoi*; D: *Portulaca halimoides*.

Portulacaceae Fig. 6. Distributions of *Portulaca*: A: *P. oleracea*; B: *P. pilosa*; C: *P. suffrutescens*; D: *P. umbraticola*.

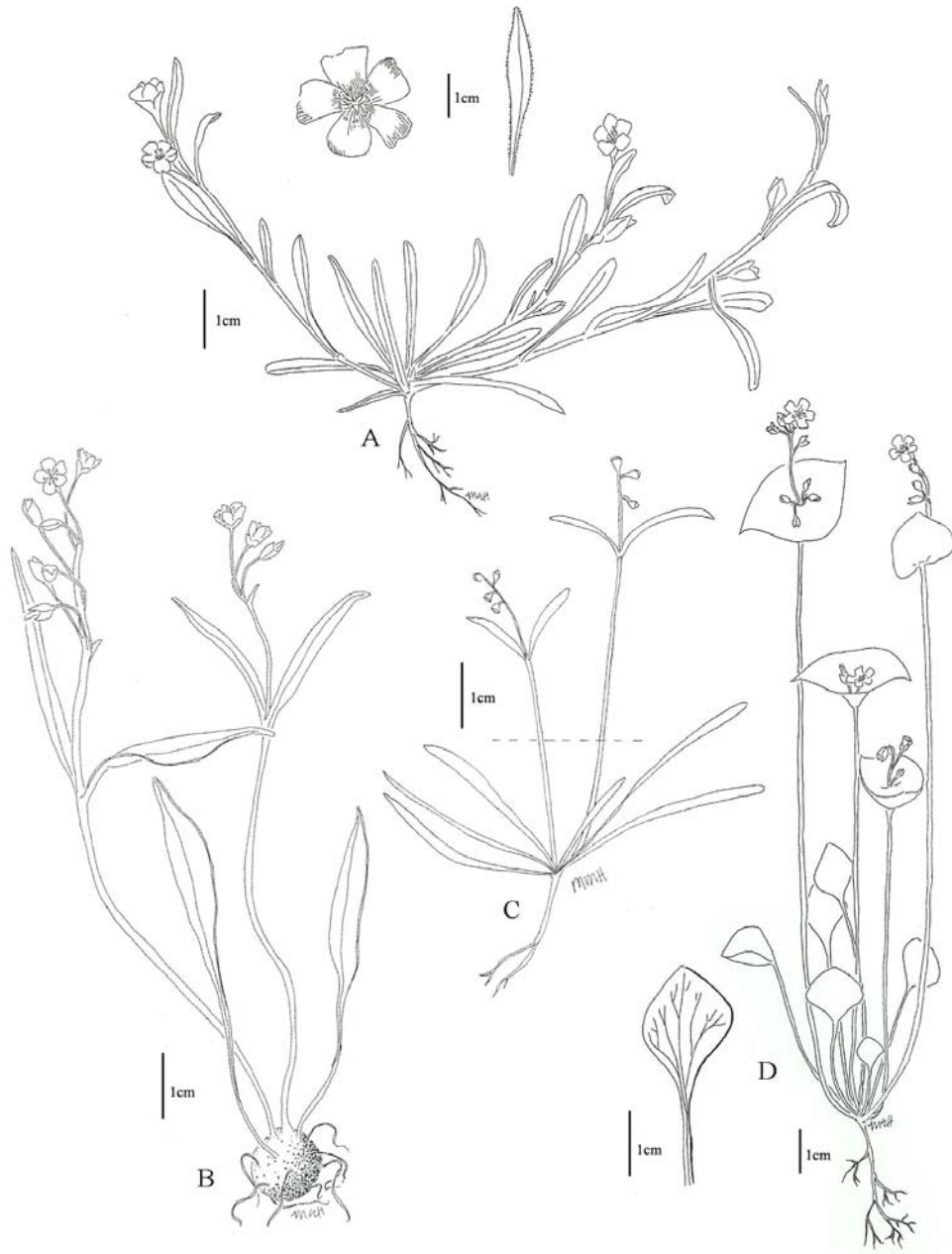


Figure 1

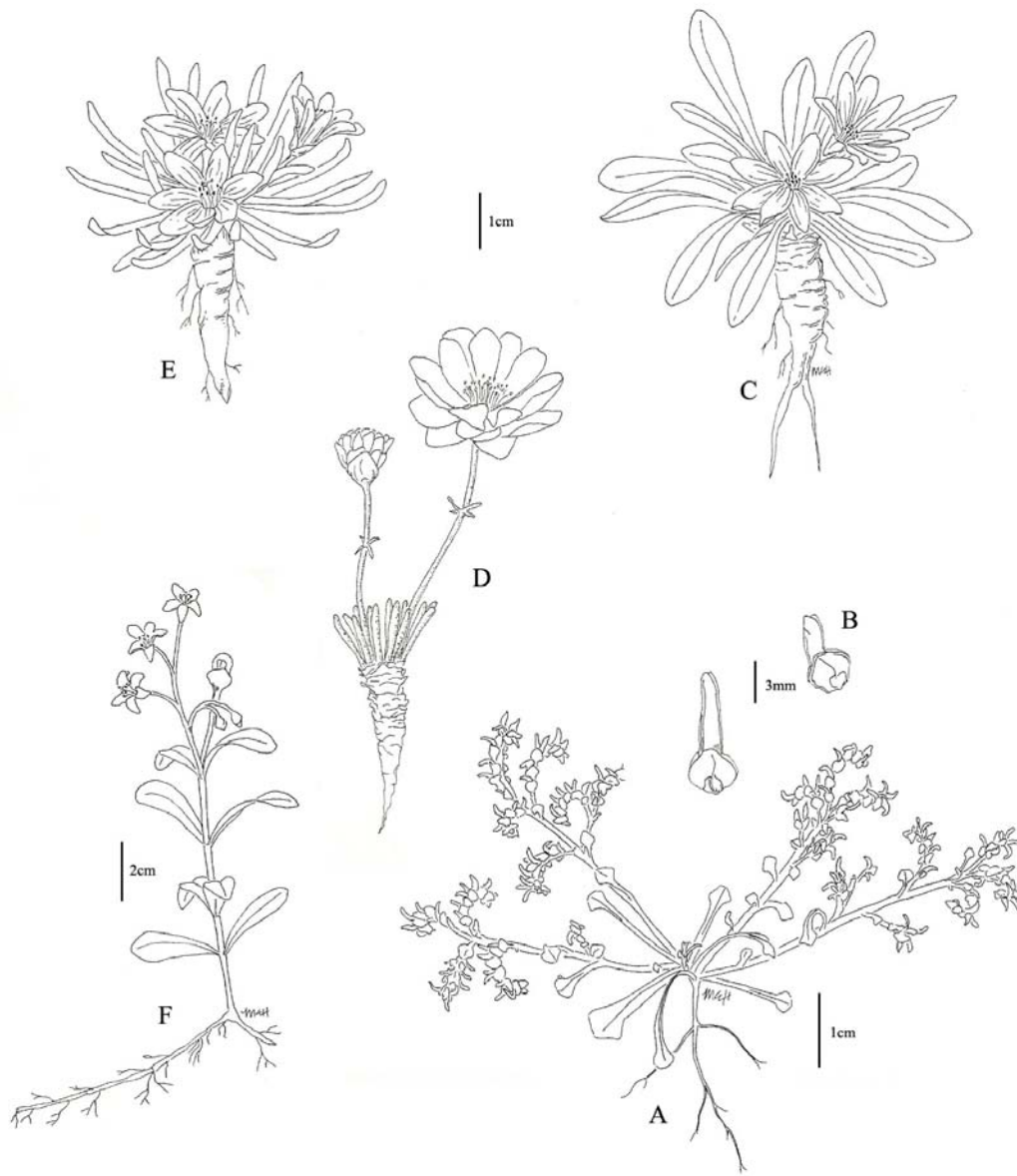


Figure 2

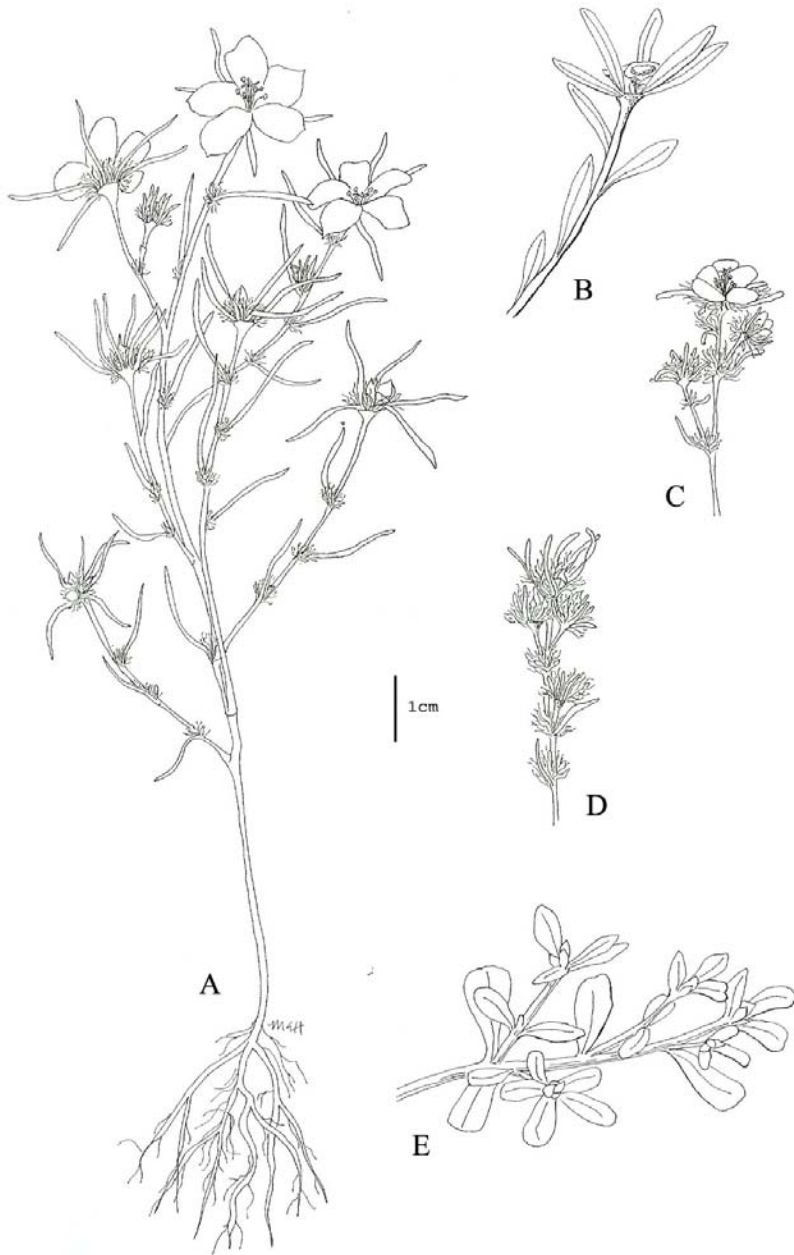


Figure3

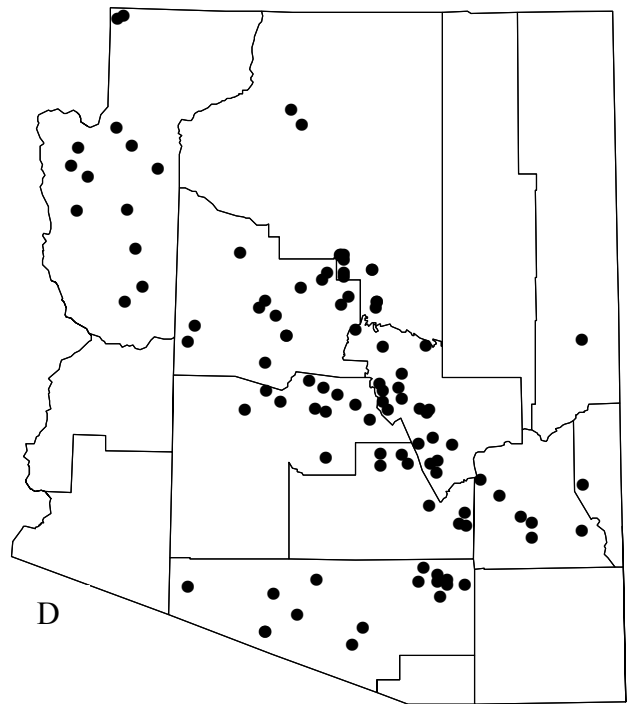
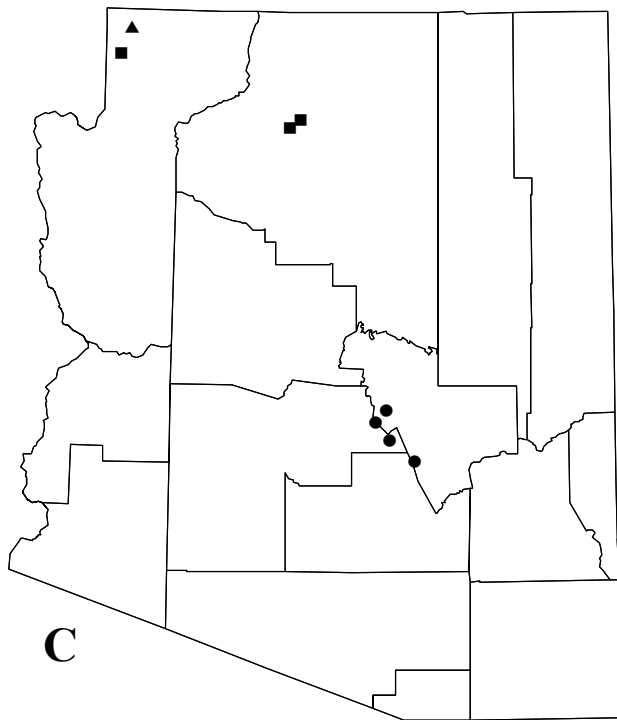
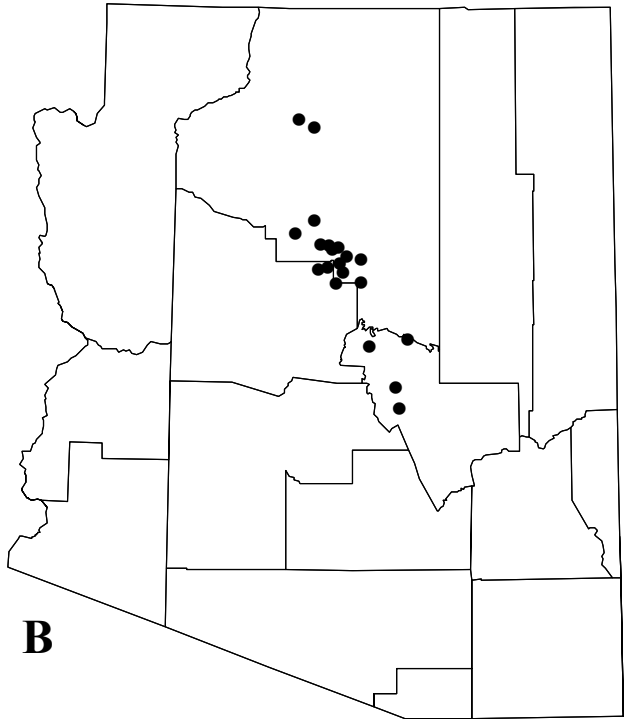
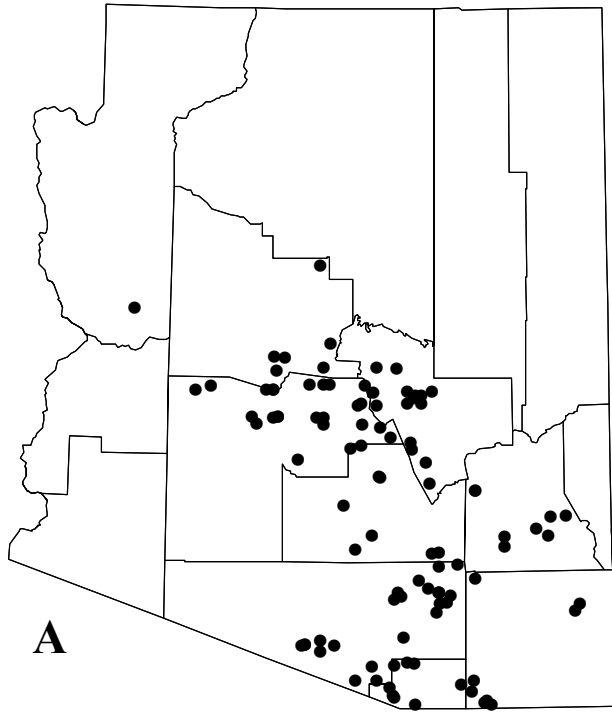


Figure 4

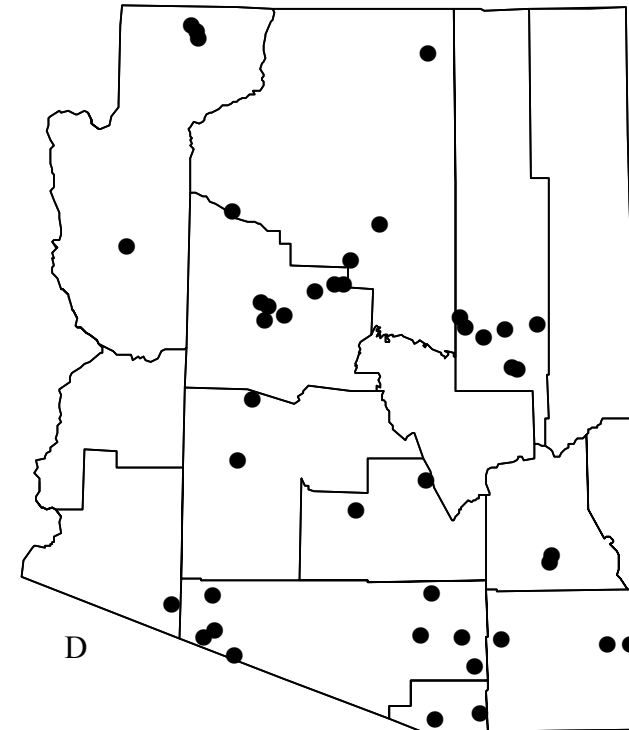
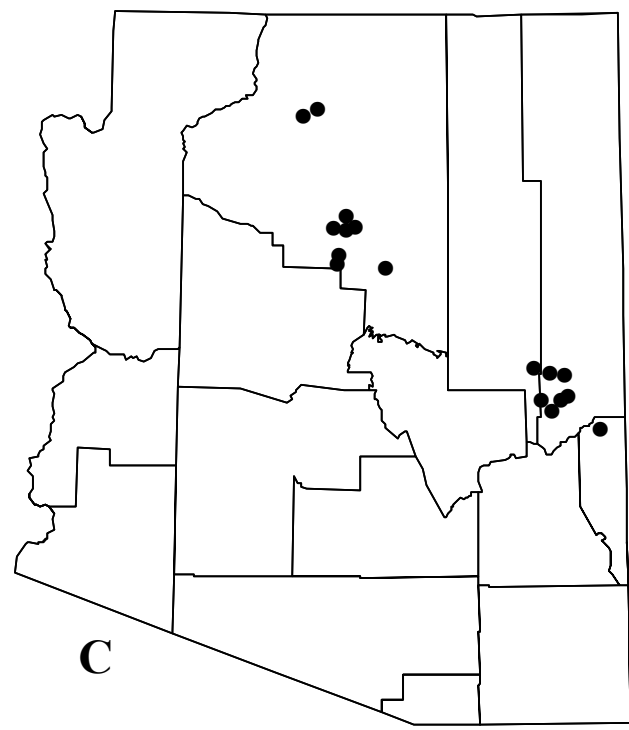
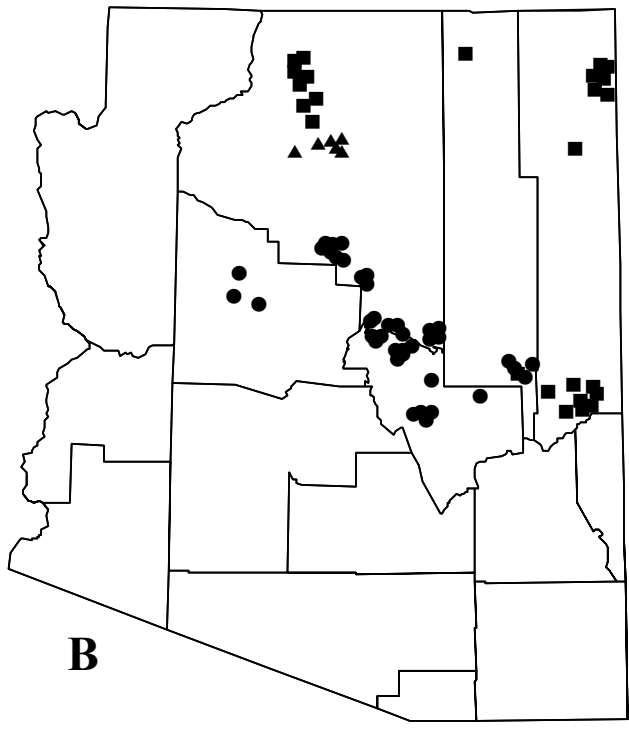
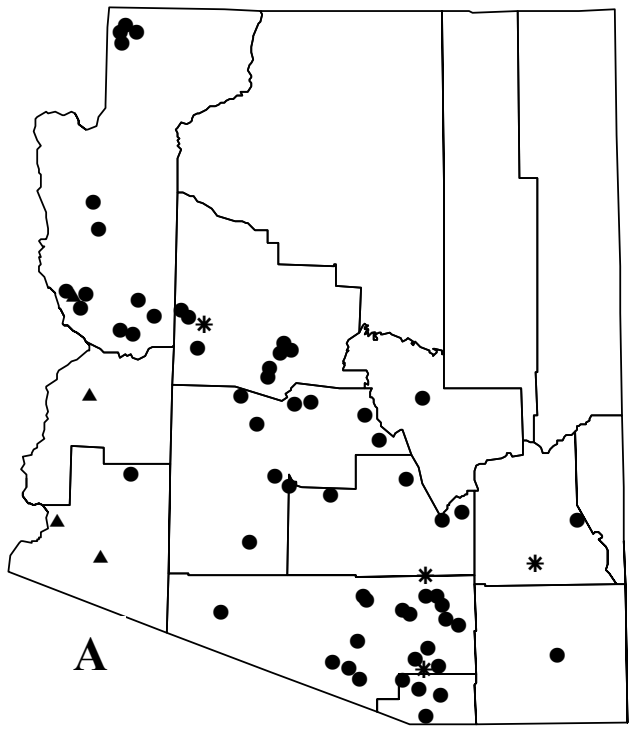


Figure 5

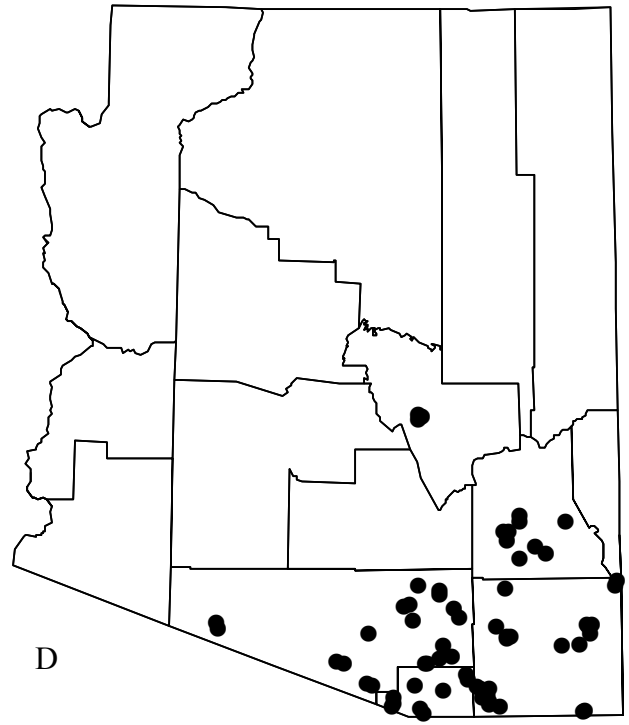
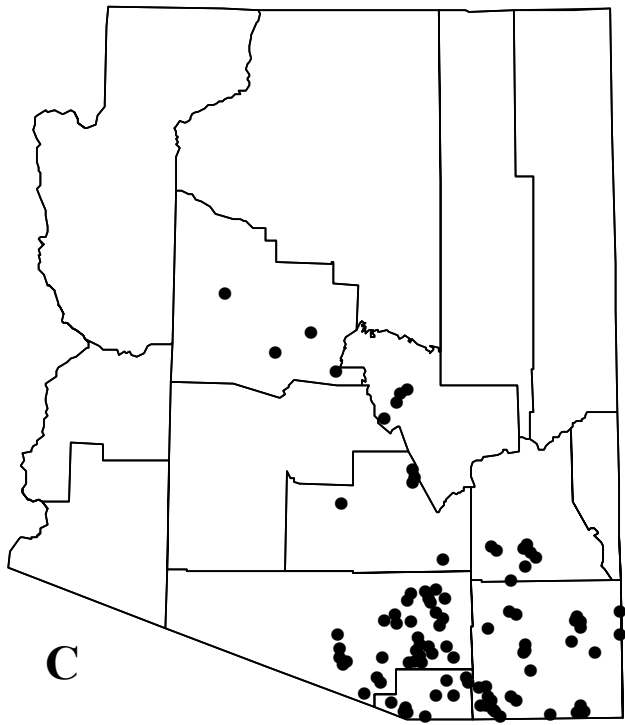
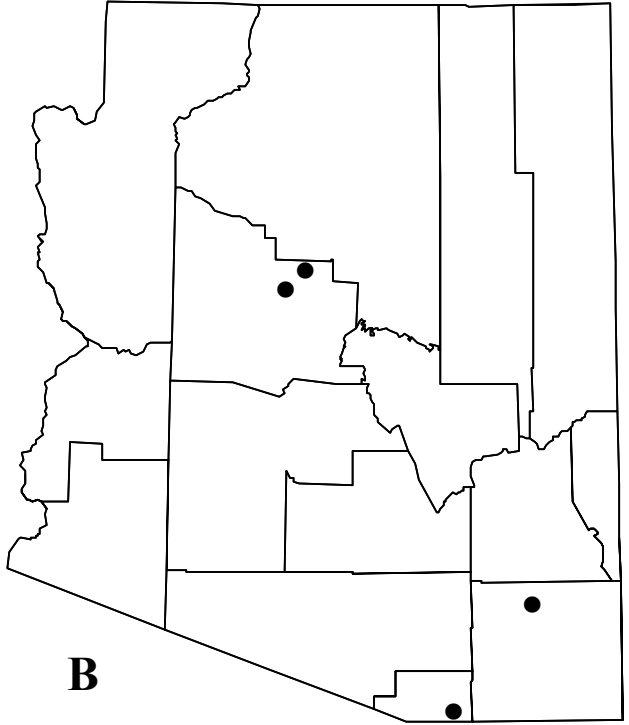
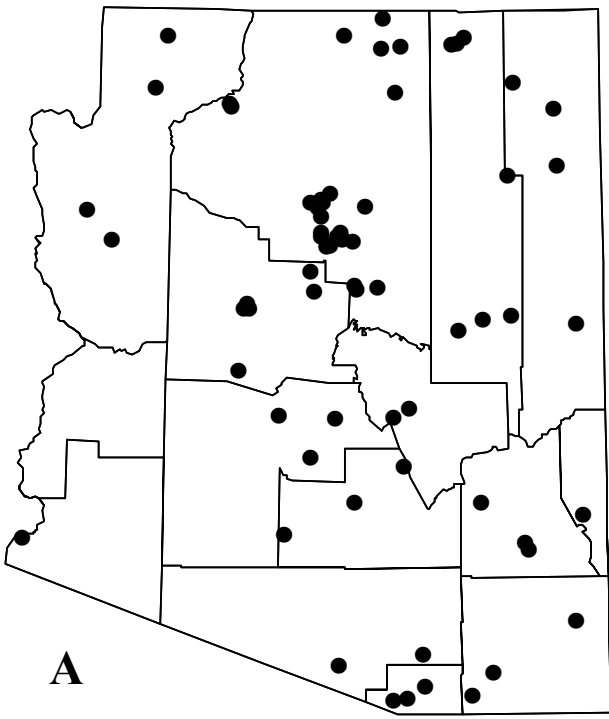


Figure 6