

PRIMULACEAE PRIMROSE FAMILY

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Plants generally herbaceous, annual or perennial with upright to prostrate stems. LEAVES cauline or basal; blades simple; margins various. INFLORESCENCES racemes, panicles, scapose umbels, or flowers axillary. FLOWERS perfect, actinomorphic; calyx partly united, ours with 4-5 lobes; corolla partly united, ours with 4-5 lobes (absent in *Glaux*); stamens 4-5, epipetalous and opposite the lobes; style and stigma 1; stigma capitate; ovary superior or partly inferior, 1-celled; placentation free-central. FRUITS valvate or circumscissile capsules. --Ca. 30 genera, ca. 1000 spp., mainly north temperate or arctic regions. Choice ornamentals from *Cyclamen*, *Dodecatheon*, *Douglasia*, *Primula*.

1. Ovary partly inferior; inflorescences racemes or panicles *Samolus*
- 1' Ovary superior; inflorescences umbels or single axillary flowers.
 2. Inflorescences scapose umbels.
 3. Corolla lobes reflexed, the apices acute to obtuse *Dodecatheon*
 - 3' Corolla lobes erect or spreading but not reflexed, the apices retuse, emarginate, or obtuse.
 4. Corolla greater than 5 mm long *Primula*
 - 4' Corolla less than 5 mm long *Androsace*
 - 2' Inflorescences axillary flowers on leafy stems.
 5. Leaves alternate (except sometimes the lowermost).
 6. Corolla present, shorter than or subequal to the calyx *Centunculus*
 - 6' Corolla absent *Glaux*
 - 5' Leaves all opposite; corolla equal to or longer than the calyx.
 7. Corolla yellow, longer than the calyx; stems erect *Lysimachia*
 - 7' Corolla salmon-colored, equal in length to the calyx; stems prostrate *Anagallis*

Anagallis L. Pimpernel

Annuals with prostrate stems. LEAVES cauline, opposite; margins generally entire. INFLORESCENCE a single long-peduncled flower in the axils of leaves. FLOWERS saucer-like in appearance; calyx deeply lobed, the 5 lobes lanceolate; corolla deeply lobed, the 5 lobes ovate, the apices obtuse; stamens 5; ovary superior. FRUIT circumscissile. --Only 1 sp. in the U.S.; 5-6 in Eur. (Greek: pimperl).

Anagallis arvensis L. (field). Poor Man's Weatherglass. --Plants 5-45 cm long. LEAVES 0.5-2 cm long, sessile; blade ovate, glabrous. FLOWERS orange or salmon-colored to scarlet; calyx 2-7 mm long; corolla 2-7 mm long, the lobes with stalked glands on the outer margins. $2n = 40$. --Moist meadows, stream banks, pond edges and moist disturbed areas: Cochise, Maricopa, Mohave, Pima, Pinal, Santa Cruz cos.; 300-1650 m (1000-5400 ft); Mar-Jun; introduced from Eur. and widely naturalized in N. Amer.

Androsace L. Rock-jasmine, Fairy Candelabra

Annuals or short-lived perennials with upright, clustered stems. LEAVES basal; margins entire or dentate. INFLORESCENCE a scapose umbel. FLOWERS white or pink; calyx lobed ca. $\frac{1}{2}$ its length, the lobes 5; corolla lobed ca. $\frac{1}{2}$ its length, the lobes 5, the apices obtuse; stamens 5; ovary superior. FRUITS valvate. --Ca. 100 spp. in north temperate regions. Although some taxonomists recognize several vars. within the two AZ species, the characters used to distinguish the vars. frequently intergrade. Therefore, no attempt is made

to distinguish them here. (Greek: some sea plant). Robbins, G. T. 1944. *Amer. Midl. Naturalist* 32:137-163.

1. Involucral bracts lance-ovate to ovate or ovate-elliptic; corolla shorter than the calyx ... *A. occidentalis*
- 1' Involucral bracts lanceolate to linear-lanceolate; corolla longer than or equal to the calyx
..... *A. septentrionalis*

Androsace occidentalis Pursh (western). --Plants 2-13 cm tall. LEAVES 2.5-19 mm long, sessile; blade lanceolate, the upper surface generally with some short stiff hairs. INFLORESCENCE with lance-ovate to ovate or ovate-elliptic bracts. FLOWERS white or sometimes white with pinkish tint; calyx 2.8-5.2 mm long, hairy, the lobes half as long to equalling the tube; corolla shorter than the calyx. $2n = 20$. [*A. occidentalis* var. *arizonica* (A. Gray) H. St. John]. --Rocky slopes and outcrops, gravelly or sandy washes, moist meadows and streamsides, from the Sonoran Desert to open pine forests: reported from all cos. except Navajo, La Paz and Yuma; 300-2400 m (1000-8000 ft); Feb-May; w Can s to IN, TX, NM, and AZ.

Androsace septentrionalis L. (northern). --Plants 1-30 cm tall. LEAVES 5-20 mm long, sessile; blades lanceolate, glabrous to pubescent. INFLORESCENCE with lanceolate to linear-lanceolate bracts. FLOWERS white or pink; calyx 2.7-4.7 mm long, glabrous or with occasional white or reddish-brown hairs, the lobes shorter than or barely equalling the tube; corolla longer than or equal to the calyx. $2n = 20$. [*A. diffusa* Small; *A. septentrionalis* var. *glandulosa* (Wootton & Standley) H. St. John, var. *puberulenta* (Rydb.) Knuth, var. *subulifera* A. Gray]. --Gravelly streambeds, springs and moist meadows, mountain parks, open coniferous forests, and rocky alpine tundra: reported from all cos. except Pinal, La Paz and Yuma; 1500-3650 m (5000-12000 ft); Apr-Sep; widely distributed across cool north-temperate regions.

Centunculus L. Chaffweed

Annuals with prostrate to ascending stems. LEAVES cauline, alternate or lowermost opposite; margins entire. INFLORESCENCE a single, nearly sessile flower in the axils of leaves. FLOWERS white or pink; calyx deeply lobed, the lobes 4(-5); corolla lobed ca. $\frac{1}{2}$ its length, the lobes 4(-5), the apices acute; stamens 4(-5); ovary superior. FRUIT circumscissile. --2-3 spp. of temperate or tropical regions. (Latin: patchwork or a small patch).

Centunculus minimus L. (little). --Plants 3-25 cm tall. LEAVES 5-10 mm long, sessile or nearly so; blades obovate to spatulate or elliptic, glabrous. FLOWERS white or pink; calyx 2-3 mm long; corolla about half as long to nearly equalling the calyx, carried beyond the calyx by the developing fruit; filaments widened at the base. $2n = 22$. --Streamsides: Cochise, Graham, Navajo, Pima, Santa Cruz cos.; 300-2150 m (1000-7100 ft); Apr-Sep; widespread in U.S. and Eur.

Dodecatheon L. Shooting Star

Perennials with upright stems. LEAVES basal, glabrous or nearly so in ours; margins various. INFLORESCENCE a scapose umbel. FLOWERS white or pink to purple or magenta and generally with a yellow tube, drooping; calyx deeply lobed, the lobes 4-5; corolla deeply lobed, the 4-5 lobes and part of the tube reflexed, the apices acute to obtuse; stamens 4-5, the filaments generally united; ovary superior. FRUITS generally valvate. --Ca. 14 spp., generally of N. Amer. (Greek: twelve gods). Thompson, H. J. 1953. *Contr. Dudley Herb.* 4:73-154.

1. Corolla lobes white (rarely maroon); leaf blade ovate or ovate-oblong, abruptly contracted to the petiole, the margins sinuate to dentate *D. dentatum*
- 1' Corolla lobes pink to maroon or purple; leaf blade linear to elliptic or oblanceolate, tapering to the petiole, the margins generally entire, or slightly dentate.
 2. Flowers 5-parted; filaments yellow, 1-2 mm long *D. radicum*
 - 2' Flowers 4-parted; filaments purple, less than 1 mm long *D. alpinum*

Dodecatheon alpinum (A. Gray) E. Greene (lofty mountain). --Plants 10-45 cm tall. LEAVES 2-15 cm long; blade tapering gradually to the petiole, linear to oblanceolate, the margins entire. FLOWERS pink to purple; calyx 6-9 mm long, the lobes 4; corolla (reflexed portion) 9-19 mm long, the lobes 4; stamens 4, the filaments purple, less than 1 mm long or nearly absent; stigma enlarged, twice the diameter of the style. $2n = 44$. --Moist mt. meadows: Apache (White Mts.), Coconino, Greenlee, Navajo cos.; 2000-3050 m (6500-10000 ft); May-Sep; sw U.S. n to Wallowa Mts. and Cascade Mts. of OR. This is a highly variable taxon that occasionally hybridizes with other species; the variability is sometimes given var. status; ours would then be var. *majus* H. J. Thompson.

Dodecatheon dentatum Hook. (toothed). --Plants 10-40 cm tall. LEAVES 3-25(-30) cm long; blade abruptly contracting to the petiole, ovate to oblong, the margins entire to sinuate or dentate. FLOWERS white or occasionally white with maroon corolla tube; calyx 4-7 mm long, the lobes 5; corolla (reflexed portion) 10-18 mm long, the lobes 5; stamens 5, the filaments less than 0.75 mm long or nearly absent; stigma equalling or slightly wider than the style. --2 vars.; sw Can. to n OR, ID, UT, AZ, NM.

Var. *ellisiae* (Standley) H. J. Thompson (for T. Ellis). --FILAMENTS yellow throughout or with some purple basally. [*D. ellisiae* Standley]. --Rich coniferous woods, springs, seeps: Apache (White Mts.), Graham (Pinaleno Mts.), Greenlee, Pima (Santa Catalina Mts.) cos.; 2400-3100 m (8000-10200 ft); May-Aug; NM.

Dodecatheon radicum E. Greene (having roots). --Plants 15-40 cm tall. LEAVES oblanceolate to elliptic, the margins entire to slightly dentate, crenate, or sinuate. FLOWERS pink to purple; calyx 5.3-8.2 mm long, the lobes 5; corolla (reflexed portion) 13-20 mm long, the lobes 5; stamens 5, the filaments (1-)1.5-2 mm long; stigma not much wider than the style. $2n = 44, 88$. [There apparently is some confusion as to whether or not *D. radicum* should be combined with *D. pulchellum* (Raf.) Merrill = *D. pauciflorum* (Durand) E. Greene. Further study is needed and until the nomenclatural problem is solved, no change is proposed here.]. --3 subspp.; s AK and Can. s to Mex. and in e US s to AR.

Subsp. *radicum*. --LEAVES 4-25 cm long; blade tapering gradually to the petiole. FILAMENTS yellow. --Moist mt. meadows: Graham Co. (Pinaleno Mts.); 2700-3650 m (8900-12000 ft); Jun-Jul; AK to Mex., e to PA.

***Glaux** L. Saltwort, Sea-milkwort

Rhizomatous, somewhat fleshy perennials, 3-30 cm tall with upright or ascending stems. LEAVES cauline, generally alternate on the upper portion of the stem and opposite near the base of the stem, 5-25 mm long, sessile; blade oval to oblong or oblanceolate, glabrous, the margins entire. INFLORESCENCE a single sessile flower in the axils of leaves. FLOWERS white to pinkish; calyx 4-5 mm long, lobed ca. $\frac{1}{2}$ its length, the lobes 5; corolla lacking; stamens 5; ovary superior. FRUITS valvate. --A monotypic genus widespread in arctic and temperate regions of N. Amer. and Eur. (Greek: bluish-green, in reference to the plant's color).

Glaux maritima L. (near the sea). -- $2n = 30$. --Alkaline meadows: to be expected in AZ (nearest locality in Garfield Co., UT); sea level to 2600 m (8500 ft); May-Aug.

Lysimachia L. Loosestrife

Perennials with upright stems in AZ. LEAVES cauline, opposite, glabrous; margins generally entire. INFLORESCENCE in AZ a single peduncled flower in the axils of leaves. FLOWERS generally saucer-like in appearance, yellow, sometimes dotted or streaked with purple; calyx deeply lobed, the lobes 5; corolla deeply lobed, the lobes 5, the apices in ours apiculate; stamens 5; 5 staminodia (anther-less appendages generally attached to the corolla and alternate with the stamens) present; ovary superior. FRUITS valvate. --100 spp., generally of north temperate regions. (Greek: loosing or released from strife). Coffey, V. J. and S. B. Jones, Jr. 1980. *Brittonia* 32:309-322; Ray, J. D., Jr. 1956. *Illinois Biol. Monogr.* 24:1-160.

Lysimachia hybrida Michx. (hybrid form). Fringed Loosestrife. --Plants 3-12 dm tall. LEAVES 5-15 cm long, the petiole obscurely to slightly ciliate; blade ovate to lanceolate. FLOWERS yellow; calyx 4-8 mm long; corolla 5-10.5 mm long. [*L. ciliata* L. var. *validula* (E. Greene) Kearney & Peebles]. --Moist meadows, streambanks: Apache, Coconino, Gila, Navajo cos.; 1500-2300 m (5000-7500 ft); Jul-Sep; s Can. s to e-central OR, ne NM, TX, and GA.

Primula L. Primrose

Perennials, generally herbaceous with upright stems. LEAVES generally basal; margins dentate, sinuate, or entire. INFLORESCENCE a scapose umbel. FLOWERS variously colored; calyx deeply lobed, the lobes 5, persistent in fruit; corolla lobed no more than ½ its length, the 5 lobes spreading 90° to the tubular portion, the apices retuse to emarginate; stamens 5, generally attached to the upper portion of the corolla tube; style generally shorter than the corolla tube; ovary superior. FRUITS valvate. --200 spp. of north temperate regions. (Latin: first, from early flowering). Williams, L. O. 1936. *Amer. Midl. Naturalist* 17:741-748.

1. Peduncles, pedicels, and calyx (sometimes also the corolla) densely glandular-pubescent, the glands brownish-yellow; corolla tube equalling or less than twice as long as the calyx; leaf margins in ours generally entire *P. parryi*
- 1' Peduncles, pedicels, and calyx mealy-white not glandular (in dried plants, the mealy-ness sometimes appears with a fine granular-like consistency); corolla tube much longer than the calyx; leaf margins dentate to sinuate.
 2. Leaves sometimes glandular-pubescent on the lower surface or margins but not mealy, the marginal teeth gland-tipped; corolla magenta *P. rusbyi*
 - 2' Leaves glabrous or mealy-white on the lower surface especially when young, the marginal teeth not glandular; corolla dark violet with a yellow center.
 3. Calyx 4.5-9 mm long; involucral bracts 4-10 mm long *P. specuicola*
 - 3' Calyx 3-4.3 mm long; involucral bracts 2-4 mm long *P. hunnewellii*

Primula hunnewellii Fernald (for F. W. Hunnewell). --Plants 5.5-15 cm tall. LEAVES 4-9 cm long, the petiole ca. the same length as the blade; blade spatulate, mealy-white on the lower surface at least when young, the margins sinuate-dentate but not glandular. INFLORESCENCE with bracts 2-4.3 mm long. FLOWERS purple or dark violet; calyx 3-4 mm long, mealy-white, the lobes 2-2.4 mm long; corolla tube 5-6 mm long, the lobes 2-3 mm long. --Limestone cliffs: Coconino Co. (n rim of the Grand Canyon); elev. unknown; Jul-Aug; known only from the type locality in AZ and perhaps represents a localized variant of *P. specuicola*.

Primula parryi A. Gray (for C. Parry). --Plants 10-40 cm tall, glandular-pubescent at least near the inflorescence. LEAVES 10-55 cm long; blade tapering to the base, elliptic to obovate, the margins entire in ours. INFLORESCENCE with bracts 5-18 mm long. FLOWERS reddish-purple with yellow center, drying blue; calyx 7-30 mm long, glandular-pubescent, the glands brownish-yellow; corolla tube 7-15 mm long, the lobes 4-10 mm long. --Springs and streamsides, damp ledges, cliff faces, crevices, and talus: Apache (Baldy Peak) and Coconino (San Francisco Peaks) cos.; 3050-3850 m (10000-12700 ft); Jun-Aug; Rocky Mts. from ID and MT to AZ and NM.

Primula rusbyi E. Greene (for H. Rusby). --Plants 7-28 cm tall. LEAVES 2-23 cm long, petiolate; blade spatulate or elliptic, generally glandular-pubescent on the lower surface or sometimes glabrous but not mealy, the margins slightly dentate, the teeth gland-tipped (if the margins are entire, the glands terminate the main veins). INFLORESCENCE with the bracts 2-5 mm long. FLOWERS magenta; calyx 3.7-8 mm long, densely mealy-white at least near the base; corolla tube 8-13.2 mm long, the lobes (4-)5-10 mm long. --Moist sites in coniferous woods, damp ledges and rock crevices: Cochise, Gila, Graham, Pima, Santa Cruz cos.; 2300-3200 m (7500-10500 ft); May-Sep; NM.

Primula specuicola Rydb. (cave dweller). --Plants 9-30 cm tall. LEAVES 4-14 cm long, the petiole winged; blade narrowly spatulate to elliptic, mealy-white on the lower surface at least when young, the margin dentate but not glandular. INFLORESCENCE with the bracts 4-10 mm long. FLOWERS dark violet with yellow center; calyx 4.5-9 mm long, generally densely mealy-white; corolla tube 8-10 mm long, the lobes 3-8 mm long. --Moist sites under overhanging cliffs: Coconino Co. (Buck Farm Canyon on the n rim of the Grand Canyon); 900-1400 m (2900-4600 ft); Mar-Jul; se UT.

Samolus L. Water-pimpernel

Perennials with upright to prostrate stems. LEAVES cauline or nearly basal, alternate; margins entire. INFLORESCENCES racemes or panicles. FLOWERS white to pink, long-peduncled; calyx shallowly lobed, the lobes 5; corolla lobed up to ½ its length, the lobes 5, the apices obtuse; stamens 5; 5 staminodia sometimes present opposite the sepals; ovary partly inferior. FRUITS valvate. --10-15 spp. distributed worldwide. (Celtic: curative properties).

1. Inflorescences completely bractless; corolla 3 mm or longer *S. ebracteatus*
- 1' Inflorescences with small (up to 1 cm long) leaf-like bracts scattered along the main axis and smaller bracts on the pedicels; corolla less than 3 mm long.
 2. Stems erect or nearly so, not stoloniferous; cauline leaves elliptic to obovate, generally crowded or sometimes even overlapping; inflorescences many flowered, rarely with less than 10
.....*S. parviflorus*
 - 2' Stems prostrate, arching, or stolon-like, often mat-forming; cauline leaves circular to obovate, widely spaced; inflorescences few flowered, rarely with more than 10 *S. vagans*

***Samolus ebracteatus** H.B.K. (without bracts). --Plants 1-30 cm tall with mostly erect stems. LEAVES crowded near the base of the plant, 2.5-15 cm long, petiolate with the bases decurrent and winged; blades broadly spatulate to oblanceolate. INFLORESCENCE lacking bracts. FLOWERS pink or white; calyx 1.4-2 mm long, glandular at least near the base, the lobes equalling or longer than the tube; corolla 3-8.2 mm long, glandular on the inner surface of the lobes; staminodia absent. --Moist meadows and streamsides: not known from AZ, possibly in Mohave Co. [nearest collection, var. *cuneatus* (Small) Henrickson, from the Muddy R. NV]; 500-1150 m (1600-3800 ft); Mar-Aug; FL to NM, NV; Mex.

Samolus parviflorus Raf. (small flowers). --Plants 10-82 cm tall with erect or ascending stems. LEAVES cauline, 1-13 cm long, petiolate or sometimes the basal sessile; blades elliptic to obovate. INFLORESCENCE with leaf-like bracts on the main axis and with tiny bracts attached at ca. midway or upper half of the pedicels; flowers 10 or more. FLOWERS white; calyx 1-2.5 mm long; corolla 1.2-3 mm long; staminodia 5. [*S. floribundus* H.B.K.] --In or along streams, springs, seeps, and moist meadows: reported from all cos. except Apache, Gila, La Paz, Maricopa, Yuma; 300-1650 m (1000-5400 ft); Apr-Oct; widespread in N. Amer.

Samolus vagans E. Greene (wandering, probably in reference to the habit). --Plants 5-30 cm long with prostrate or arching stems or sometimes stoloniferous or mat-forming. LEAVES cauline, 0.5-6 cm long, petiolate or nearly sessile; blades circular, obovate or spatulate. INFLORESCENCE with leaf-like bracts on the main axis and with tiny bracts attached on lower half of the pedicels; flowers 2-10. FLOWERS white; calyx 1-2.3 mm long; corolla 1-3 mm long; staminodia 5. --In or along streams, pools, or moist-wet meadows: Cochise, Pima, Santa Cruz cos.; 1050-1900 m (3500-6200 ft); May-Oct; possibly n Mex. This taxon possibly represents a localized variant of *S. parviflorus* and perhaps should not be separated from it until further work (especially common garden studies) is accomplished. The traditional treatment is followed here.