Primulaceae (Primrose Family) Traits, Keys, & Comparison Charts

Primulaceae Traits

- Leaves in **basal rosettes**, **terminal whorls**, or **cauline** and opposite or whorled; blades are simple, with entire or finely dentate (denticulate) margins.
- Scapes or leafy stems may be glabrous or pubescent.
- Some *Primula* species have minute glands that secrete a white, waxy, powder-like substance (farina) that coats portions of the scape, pedicels, calyx, and lower leaf surfaces; primrose species with a coating of farina are described as **farinose**.
- Flowers are **solitary and axillary**, or **in terminal or axillary inflorescences** (umbels, racemes, or panicles) of few to many flowers.
- Flowers are **bisexual** with **regular (actinomorphic) symmetry**.
- The **calyx** is either fused into a tube below, usually with 5 erect to ascending lobes, or fused only at the base, with 5–9 spreading lobes; the calyx is petaloid in *Glaux*.
- The **corolla** is either fused below the middle into a slender tube, usually with 5 spreading lobes at the apex (*Primula, Androsace*), or fused only near the base, with 5–9 spreading to ascending lobes (*Trientalis, Lysimachia*); a corolla is lacking in *Glaux*.
- **Stamens usually 5** (6–9 in *Trientalis*, 5–7 in *Lysimachia*); **filaments are fused (adnate) to the base or side of the corolla** and are either **separate** or partially **monadelphous** (fused below the middle into a tube around the pistil); anthers are yellow).
- The single pistil has a **superior ovary of 5 fused carpels, with a single locule, style, and stigma**.
- The fruit is a **capsule with** (in NL species) **valvate dehiscence** (splitting open along the suture lines of the carpels.
- Seeds 1–200+ (2–15 in *Trientalis*, 10–100+ in *Primula*).

Note: While some botanists follow Galasso et al. (2005) and Manns & Anderberg (2005, 2009), respectively, in lumping *Glaux* and *Trientalis* in the genus *Lysimachia*, these three genera will continue to be treated as distinct in this *Flora*. The change to include several morphologically distinct species in a broader concept of the genus *Lysimachia*, based on molecular research using a very limited number of genes, does not coincide with the traditional concept of the genus as a group of closely related species that share morphologically recognizable traits. The only morphological traits that the broad, combined genus *Lysimachia* share are bisexual flowers with regular symmetry, stamens fused (adnate) to the base of the corolla, a superior ovary of 5 fused carpels with a single locule, style, and stigma. Certainly not enough traits to recognize *Lysimachia, s.l.* (*sensu lato* – in the broad sense) in the field.

Primulaceae (Primrose Family) Key

Key to the species in Newfoundland and Labrador

1a. Plants with a whorl of 4–10 leaves at the top of a slender stem, to 2.6 dm tall; flowers 1–3, solitary in axils of the terminal leaves; corolla white, with 6–9 acute to acuminate lobes. ..... ***Trientalis borealis*** (starflower)

1b. Plants with rosettes of basal leaves, or plants with cauline, opposite or whorled leaves; flowers solitary and axillary, in few-flowered terminal umbels, or in terminal or axillary racemes or panicles; corolla white, yellow, various shades of pink or purple, or absent. .. **2**

2a. Leaves in basal rosettes; flowers arranged in scapose umbels; the corolla is salverform, with a yellow tube and 5 spreading white, pink, or purple lobes; a yellow ring is present around the mouth of the corolla tube. **3**

2b. Leaves cauline and opposite or whorled; flowers solitary and axillary, or in racemes or panicles; a corolla may be present or absent; when present, the corolla is yellow and deeply lobed; when absent, the calyx lobes are pink and petaloid. **7**

3a. Scapes and pedicels are finely pubescent; basal rosettes lie ± flat to the ground; leaves are glabrous to slightly pubescent, margins are ciliate; flowers 5–25, in 1–5 terminal umbels; pedicels are slender, to 6 cm long and unequal in length; calyx lobes are triangular, acute, and shorter than the calyx tube; corolla lobes are white, oblong, entire, and rounded at the apex; capsules are spherical; very rare plants of limestone cliffs and talus slopes in western Newfoundland. ..... ***Androsace septentrionalis*** (northern rock jasmine)

3b. Scapes and pedicels are glabrous, but often ± farinose; basal rosettes with spreading to ascending leaves; leaf surfaces and margins are glabrous; flowers usually 2–12, in terminal umbels (seldom solitary); pedicels are slender or stout, 2–35 mm long; calyx lobes are oblong to elliptic, obtuse, and longer than the calyx tube; corolla lobes are white or pink to purple, obcordate, and 2-lobed or notched at the apex; capsules are cylindric or ellipsoid; plants of both Newfoundland and Labrador (*Primula*). **4**

4a. Plants 4–24 cm tall; leaf blades are oblanceolate, elliptic, or ovate, with distinct, unwinged petioles and an obtuse to rounded apex; margins are usually entire; flowers 1–6, corolla usually white; pedicels less than 1 cm long; lower leaf surfaces, scapes, and calyx lack a white, waxy (farinose) coating. .... ***Primula egaliksensis*** (Greenland primrose)

4b. Plants 3–48 cm tall; leaf blades are elliptic, oblanceolate, rhombic, spatulate, or obovate, with winged petioles and an acute to obtuse apex; margins are usually shallowly dentate, seldom ± entire; flowers 1–12, corolla white or pink to purple; pedicels up to 3.5 cm long; lower leaf surfaces, scapes, and calyx often with a white, waxy (farinose) coating. **5**

5a. Plants 3–21 cm tall; pedicels are slender, flexible, and 0.5–3.5 cm long; flowers usually spreading or nodding; leaves are small, usually 1–3 cm long (seldom to 7 cm) in our area, with a broad, winged petiole nearly as wide as the blade; margins are shallowly dentate; the scape, pedicels, calyx, and lower leaf surfaces with a very sparse farinose coating, or lacking a farinose coating. ..... ***Primula mistassinica*** (Mistassini primrose)

5b. Plants 5–48 cm tall; pedicels are usually stiff, erect to ascending, up to 1 cm long; flowers are ascending to ± spreading; leaf blades range from 1–13 cm long and taper gradually to the petiole; margins are shallowly dentate; the scape, pedicels, calyx, and lower leaf surfaces are strongly to somewhat farinose. **6**

6a. Plants to 48 cm tall, usually strongly farinose; leaf blades 3–13 cm long, with a broadly-winged petiole; calyx lobes are 3–11 mm long; flowers are 9–16 mm across, the corolla tube is 6–9 mm long; plants of limestone barrens and shores in Nfld. & Lab. ..... ***Primula laurentiana*** (Laurentian primrose)

6b. Plants to 30 cm tall, slightly farinose; leaf blades 1–6 cm long, with a narrowly winged petiole; calyx lobes are 4–6 mm long; flowers are 4–8 mm across, the corolla tube is 4–10 mm long; arctic plants of coastal areas, found mainly in nLab., rare in nwNfld. ..... ***Primula stricta*** (upright primrose)

7a. Plants to 4 dm tall; flowers solitary, in the axils of mid-stem leaves; calyx lobes 5, petaloid, pink; corolla absent; leaves are usually opposite, sessile, elliptic to oblong, up to 2.6 cm long, with obtuse to acute apices, and ± succulent; capsules are spherical, with a short, broad beak; plants succulent, restricted to coastal marshes and mudflats. ..... ***Glaux maritima*** (sea milkwort)

7b. Plants to 12+ dm tall; flowers solitary, or in racemes or panicles, and axillary or terminal; calyx lobes 5–7, green; corolla yellow, the 5–7 linear to ovate lobes fused only at the base; leaves are opposite or whorled, sessile, or with petioles to 1.6 cm long; leaf blades are narrowly elliptic to ovate, 3–16 cm long, with obtuse to acuminate apices; capsules are spherical, with a persistent slender style; plants not succulent, nor restricted to coastal habitats (*Lysimachia*). **8**

8a. Leaves opposite; blades are narrowly elliptic to linear-lanceolate, 3–10 cm long; flowers numerous in terminal racemes, 1–3 dm long; pedicels up to 2 cm long; corolla lobes are lanceolate, yellow, with 2 reddish-brown spots at their base and often few, reddish-brown fine streaks in the petals; filaments and adjacent petal bases are stipitate-glandular; later in the season, reddish-brown vegetative bulbils develop in the upper leaf axils. ..... ***Lysimachia terrestris*** (swamp candles)

8b. Leaves opposite or whorled; blades are narrowly elliptic to ovate, 5–16 cm long; flowers are solitary and axillary, or in racemes or panicles; pedicels 1–7 mm long; corolla lobes are linear to ovate, yellow, or yellow grading to orange or reddish-brown at the base; filaments are free or fused at the base; vegetative bulbils are absent. **9**

9a. Leaves are narrowly elliptic to linear-lanceolate, 5–16 cm long × about 2–3 cm wide (rarely to 6 cm wide), surfaces are glabrous above to sparsely pubescent beneath; flowers are small and numerous, in dense, axillary racemes; pedicels are very short (1–4 mm long); calyx lobes 5–7; corolla lobes 5–7, linear, 3–7 mm long, yellow, with tiny orange spots near the apices; stamens with filaments free to the base; native plants of shallow water and wet shores. ..... ***Lysimachia thyrsiflora*** (tufted loosestrife)

9b. Leaves are lanceolate to ovate, 5–13 cm long × 1–4 cm wide, surfaces are pubescent with non-glandular and often stipitate glandular hairs; flowers are larger, solitary, in axillary whorls, or in panicles; pedicels short or long; calyx lobes usually 5; corolla lobes usually 5, lanceolate to ovate, 8–20 mm long, yellow, sometimes orange to reddish-brown at the base; stamens are monadelphous, with filament fused below the middle into a tube around the pistil; introduced garden plants or escapes. **10**

10a. Flowers solitary and axillary, with 3–8 flowers per node; calyx lobes 5–9 mm long, green throughout; corolla lobes mostly yellow, grading to orange or reddish-brown at the base, elliptic to ovate, 12–20 mm long, apices are acute to acuminate, margins are ciliate with glandular hairs; leaves are whorled, usually 3–4 per node; petioles are 5–16 mm long, blades are 5–10 cm long × 1–4 cm wide; plants often found naturalized or persistent at old homesteads, or where people dump garden refuse. ..... ***Lysimachia punctata*** (spotted loosestrife)

10b. Flowers several, in terminal and axillary panicles, 2–8 cm long; calyx lobes 2.5–5 mm long and green, usually with red margins; corolla lobes usually solid yellow, elliptic to oblong, 8–12 mm long, apices are obtuse to rounded, margins are neither ciliate nor glandular; leaves are opposite or whorled, usually 2–3 per node; petioles are 1–6 mm long, blades are 7–13 cm long × 1.5–4 cm wide; plants usually not found outside of gardens, but included here for comparison to *Lysimachia punctata*. .... ***Lysimachia vulgaris*** (garden loosestrife)

Primulaceae Chart 1. *Genus* Comparison Chart I			
	Glaux maritima	***Lysimachia*** (genus)	***Trientalis borealis***
	sea milkwort	yellow loosestrife	starflower
Plants	perennial herbs, stem erect, 0.5–4 dm tall, **± succulent**, glabrous	perennial herbs, stems erect, **to 12 dm tal**l; glabrous or pubescent	perennial herbs, stem erect, to 2.6 dm tall, glabrous
Leaves	**cauline, opposite; sessile**, becoming crowded near the tip; **blades elliptic oblong, or ovate, ± succulent and glaucous, to 2.6 cm long × up to 1 cm wide; apex obtuse to rounded**, base rounded to truncate, margins entire	**cauline, opposite or whorled;** sessile or short-petiolate; blades linear-lanceolate, elliptic, lanceolate, or ovate, **3–16 cm long × 0.5–6 cm wide;** apex obtuse to acuminate; base tapering to rounded; margins entire, sometimes pubescent	**4–10 ± sessile leaves in a whorl at the top of the stem; blades elliptic to lanceolate, 2.5–10 cm long × 0.5–4.5 cm wide;** apex acute to acuminate, base attenuate, margins entire; often with a few smaller leaves below the terminal whorl
Flowers	**flowers solitary and sessile in axils of the mid-stem leaves**	**terminal and/or axillary, racemes, panicles, verticils, or solitary flowers**; pedicels 0.1–3.5 cm long	**flowers 1–3, emerging from the axils of the terminal leaves**; pedicels slender, erect, 1.5–4 cm long
Calyx	**lobes 5, pale pink, often finely spotted, lobes ovate, obtuse to rounded at the apex, 3–5 mm long**	**lobes 5–7**, green, deeply lobed, elliptic or linear-lanceolate, 1–8 mm long	**lobes 6–9,** green, **linear to very narrowly lanceolate, to 1 cm long**
Corolla	**none**	**yellow, 5–20 mm across; lobes 5–7, linear to ovate**, divided nearly or partially to the base; apices rounded to acuminate; lobes sometimes spotted with orange	**white, 5.5–13 mm across**, **lobes 6–9, ovate**, divided nearly to the base; apices acute to acuminate
Stamens	**5, filaments pink, stout, not fused at the base**; anthers yellow	**5–7, filaments yellow, distinct or monadelphous** (fused into a ring) below the middle	6–9; filaments white, slender; fused (connate) at the base, anthers yellow
Capsule	spherical, 2.5–3.5 mm long; glabrous, **with a short, broad beak at the tip**	spherical, 2–6 mm long; **with a long, slender beak (persistent style)**; seeds 1–20	spherical, glabrous, ± **subtended by the persistent calyx lobes; seeds 2–15, black, angular, with a reticulate, white coating that flakes off**

Primulaceae Chart 2. *Lysimachia* Species Comparison Chart				
***Lysimachia* sp.:**	***L. terrestris***	***L. thyrsiflora***	***L. punctata***	***L. vulgaris***
	swamp candles	tufted loosestrife	spotted loosestrife	garden loosestrife
Plants	erect, to 10 dm tall, **glabrous; elongate, reddish-brown bulblets present in leaf axils** in later growing season	erect, to 8 dm tall, glabrous below to usually finely pubescent near the apex; bulblets absent	erect, to 10 dm tall, pubescent and sparsely stipitate-glandular; bulblets absent	erect, to 12+ dm tall, **softly pubescent and ± stipitate-glandular**; bulblets absent
Leaves	**opposite, ± sessile or with a short petiole <1 cm long**; **leaves are narrowly elliptic, elliptic, or linear-lanceolate**, 3–10 cm long × 0.4–2 cm wide; tapering at both ends; apex obtuse to acuminate; margins entire; surfaces are glabrous, **often glaucous beneath**	**usually opposite, ± sessile;** mid-stem and upper **leaves narrowly elliptic to linear-lanceolate**, 5–16 cm long × usually 2–3 cm (rarely 6) wide; base cuneate to rounded; apex acuminate; margins entire; upper surface ± glabrous; **lower surface sparsely pubescent**	**mostly in whorl of 3–4 leaves; petiole 5–16 mm long; blades lanceolate to ovate**, 5–10 cm long × 1–4 cm wide; base obtuse to rounded, apex acute; margins entire; **surfaces are densely pubescent and stipitate-glandular**	**opposite to whorled (usually 2–3); petiole to 6 mm long**; **blades lanceolate, oblong, to ovate**, 7–13 cm long × 1.5–4 cm wide; base obtuse to rounded; apex obtuse to acuminate; **margins entire and ciliate; pubescent, and often ± stipitate-glandular beneath**
Flowers	**numerous in terminal racemes, 10–30 cm long**, peduncles and pedicels glabrous; pedicels 0.5–2 cm long	**numerous in racemes, 1–3 cm long, in axils of mid-stem leaves**; peduncles finely pubescent; pedicels 1–4 mm long	**solitary and axillary, or in axillary clusters (verticils) of 3–8 per node**; pedicels 1–3.5 cm long, pubescent and stipitate-glandular	**several in panicles, 2–8 cm long, terminal and often axillary; pedicels 2–7 mm**, pubescent and ± stipitate-glandular
Calyx Lobes	**5–7,** lanceolate to elliptic, 2–6 mm long, green, margins often finely stipitate-glandular	**5–7,** linear-lanceolate, **1–3.5 mm long**, green, glabrous	**5**, lanceolate, **5–9 mm long, green throughout**; surfaces stipitate-glandular	**5**, lanceolate, **2.5–5 mm long, green with red margins;** pubescent and stipitate-glandular
Corolla Lobes	**5–7, free to the base; yellow, finely streaked with reddish-brown, lanceolate to oblong**, 5–7.8 mm long; **each lobe base with 2 orange spots and stipitate-glandular**; apex rounded to acute	**5–7**, divided nearly to the base; **pale yellow, linear**, 3–7 mm long, **with orange dots near the acute to acuminate apex**	**usually 5,** divided ±to the base; **yellow to reddish-orange at the base**; **elliptic to ovate, 12–20 mm long;** apex acute to acuminate; **margins and upper surface stipitate-glandular**	**usually 5,** divided nearly to the base; **yellow, elliptic to oblong, 8–12 mm long**; margins entire, apex obtuse to acute; **upper surface stipitate-glandular**
Stamens	5–7; filaments yellow, stipitate-glandular, **fused at the base**	5–7; filaments yellow, **distinct or fused at the base**	5, filaments yellow, 2–2.5 mm long, **fused (monadelphous) to above the middle**	5, filaments 1.5–2.2 mm long, **filaments orange above the monadelphous base**
Capsules	globose, glabrous, 3–3.5 mm long	globose, glabrous, 2–3 mm long	globose, glabrous, 4–5.5 mm long	globose, glabrous, 3.5–6 mm long

Primulaceae Chart 3. *Androsace* and *Primula* Comparison Chart		
	Androsace septentrionalis	***Primula* (genus)**
	northern rock jasmine	primrose
Plants	**annual or biennial herbs**, leafless flowering stems (scapes) to 3 dm tall, **finely pubescent or stipitate-glandular; scapes usually 1–5;** plants not farinose.	**perennial herbs**, leafless flowering stems (scapes) to 4.8 dm tall, **usually glabrous**; scapes solitary; lower leaf surfaces, scapes, and calyx **farinose** in some species.
Leaves	basal rosettes of nearly sessile leaves, **usually ± flat to the ground**; blades are **elliptic to oblanceolate, to 3 cm long × up to 1 cm wide**, obtuse at the apex, cuneate at the base; glabrous to finely pubescent; **margin usually entire** or with a few shallow teeth, **and finely ciliate**	basal rosettes of nearly sessile to petiolate, **spreading to ascending leaves**; petioles winged in some species; **blades elliptic, ovate, oblanceolate, or obovate, 1–13 cm long × 0.2–3 cm wide**; tapering gradually or abruptly to the base; glabrous; **margins entire or shallowly dentate**
Flowers	**1–5 umbels of 5–25 very small flowers**, each **about 3 mm across**; **pedicels stiff, slender, of different lengths**, <1 to 6 cm long, finely pubescent; involucral bracts linear-lanceolate, to 3 mm long	**a single umbel** of 2–12 **flowers** (seldom solitary)**, each 4–20 mm across**; **pedicels stiff, flexible, or nodding, usually of similar lengths, 1–35 cm long**, glabrous; involucral bracts linear-lanceolate, 2–14 mm long
Calyx	**campanulate** (bell-shaped), lobes 5, erect, **triangular**, **strongly ridged on the outer surface**, acute at the apex, **yellowish on the tube between the green ridges**, sometimes reddish, 3–5 mm long	**cylindric to ellipsoid,** lobes 5, erect, **linear, elliptic, to narrowly oblong, obtuse to rounded at the apex, green to purplish**, 3–11 mm long
Corolla	lobes 5, **white, oblong, entire (not notched) at the apex**, with a faint, yellow ring around the mouth of the tube; corolla tube yellow, never longer than the calyx	lobes usually 5, **white, or various shades of pink to purple, distinctly notched at the apex**, with a conspicuous yellow ring around the mouth of the tube; corolla tube yellow, usually longer than the calyx
Stamens	5, included within the corolla tube	5, included within the corolla tube
Capsule	**globose, 3–5 mm long**, about as long as the calyx; **seeds 20**	**cylindric or ellipsoid, 2.5–13 mm long**, about as long to nearly twice as long as the calyx; **seeds 10–100+**

Primulaceae Chart 4. *Primula* Species Comparison Chart				
***Primula* sp.:**	***P. egaliksensis***	***P. mistassinica***	***P. laurentiana***	***P. stricta***
	Greenland primrose	Mistassini primrose	Laurentian primrose	upright primrose
Plants	4–24 cm tall, scapose, glabrous, not farinose	3–21 cm tall, scapose, glabrous, **not or only slightly farinose**	**10–48 cm tall**, scapose, glabrous, **upper scape and calyx usually very farinose**; seldom not farinose	5–30 cm tall, scapose, glabrous, **upper scape, calyx, and lower leaf surfaces slightly farinose**
Leaves	**abruptly narrowing to an unwinged petiole**; **blades oblanceolate, elliptic, to ovate;** 1.5–5.5 cm long × 0.5–1.5 cm wide, **apex rounded to obtuse; margins usually entire** to shallowly dentate	**petioles short and narrowly winged**; **blade elliptic, oblanceolate, to obovate, 1–7 cm long × 0.2–1.6 cm wide**, apex obtuse to acute; **margins shallowly dentate** to ± entire	petioles broadly winged; **blades oblanceolate, rhombic, to spatulate**, 3–13 cm long × 0.3–3 cm wide, apex obtuse to acute; **margins shallowly dentate**; **lower surface usually farinose**	petiole narrowly winged; blades **oblanceolate to oblanceolate, spatulate**, 1–6 cm long × 0.3–1.5 cm wide, apex rounded, obtuse, to acute; **margins entire or shallowly denticulate**
Flowers	terminal umbel of up to 6, usually erect flowers, on slender **pedicels 2–9 mm long**; involucral bracts slightly bulging (gibbous) at the base	terminal umbel of up to 10 **nodding flowers on slender, flexible pedicels 5–35 mm long**; **involucral bracts not bulging at the base**	terminal umbel of **3–12 erect flowers on stiff pedicels** 5–10 mm long; involucral bracts bulging (gibbous) at the base	terminal umbel of 2–9 flowers on slender, erect pedicels 1–8 mm long; involucral bracts ± bulging (gibbous) at the base
Calyx	glabrous, **not farinose**; lobes 5, 4–6 mm long	glabrous, **not farinose**; lobes 5, 3–6 mm long	glabrous, **usually very farinose**; lobes 5, **5–11 mm long**	**finely glandular-pubescent**, **slightly farinose**; lobes 5, 4–6 mm long
Corolla	**usually white**, seldom lavender, **5–8 mm across**; tube 6–8 mm long, yellow; lobes 5, apex notched	**pink, purple, or white, 8–20 mm across;** tube 5–8 mm long, yellow, lobes 5, apex notched	**usually pink or purple, 9–16 mm across**; tube 6–9 mm long, yellow, lobes 5, apex notched	**usually pink or purple, 4–8 mm across**; tube 4–10 mm long, yellow; lobes 5, apex notched
Capsules	**cylindric, 6–13 mm long**	ellipsoid, 3–6 mm long	ellipsoid, 2.5–5 mm long	ellipsoid, 3–4 mm long

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